

Environmental Agreements Environmental Effectiveness

Case studies

Environmental Issues Series 3 Volume II

European Environment Agency



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Introductory Note

This Volume II consists of a detailed analysis of the six case studies presented in the table below which was summarised in the main report (Volume I). Analysis of the case studies is based on information provided from interviews and questionnaires. For each, a list of persons contacted as well as a list of specific references is included at the end; additional references can be found in the main report. Acronyms and abbreviations used in the case studies are listed at the end of this volume.

At the EEA's request, the information on the case studies was revised through the respective National Focal Point. Some of revisions ensued from constructive comments by independent experts, whose name is mentioned at the beginning of the relevant section. We are grateful to all those who assisted in this work.

Teresa Ribeiro
Project Manager

Table 1.0: 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)	Updated declaration of German Industry on precautionary measures for climate protection.
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.

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- *Review of the main Environmental Agreements in use*
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- *Framework for the assessment of the environmental effectiveness of EAs*
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1. Case Study 1

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

1.1 Summary Information on EA

Case Study 1:

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

ρ The Environmental Issue	The treatment of end-of-life vehicles, and design of cars, to improve the recovery, re-use and recycling of materials
ρ Target	No more than 15% of total car weight landfilled 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
ρ Start Date	1993
ρ Timescale	9 years — to be reviewed for long-term target date
ρ Number of Signatories	24 signatories
ρ Parties	— 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
ρ Type of EA	Target-setting EA, with distribution of responsibilities, for a widely accepted target
ρ 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 actors (e.g. car companies and insurers)
ρ Other provisions/ principles	— Distributed responsibility between parties for meeting targets — Respect for market forces — Free choice between material re-use, re-cycling and energy recovery
ρ Legal Basis	Moral Obligation

1.2 Background and Context

1.2.1 The Country Context

In the late 1980s there was a commercial battle between the car manufacturers, based on claims of the recyclability of their cars (an example was the announcement that BMW

were developing a database on the disassembly and recycling of different car models). The ever more ambitious claims led to a backlash from the public, in particular from the Greens in Germany, who demanded proof to back up these claims.

* The case study was revised by Frank Aggeri (CERNA, Ecole des Mines, Paris).

In the late 1980s the European Commission initiated work on Priority Waste Streams (PWS). One of these waste streams was end-of-life Vehicles (ELVs). The French took the lead in co-ordinating this work at EU level. The PWS work was important in defining the scale of the waste stream, in identifying solutions being developed across Europe and in setting the baseline for action. It also brought together some of the actors who are involved in the French EA. A working group on ELVs was set up in France.

There has traditionally been a close relationship between the large car manufacturers in France and the Ministry of Industry. It is also estimated that 20% of employment in France is associated with the car sector. With increased interest from policy makers at Member State and EU level in the environmental impacts of ELV, the impact of potential legislation on the sector became an increasingly important issue.

1.2.2 The Environmental Issue

As the number of cars in use increases, there are growing concerns about the impact on the environment of their manufacture, use and disposal. Since the late 1980s there has been a greater focus on the disposal of cars and a range of different issues have been raised. These include the methods of treatment, recycling and disposal, the allocation of responsibility for disposal (who should bear the cost of appropriate treatment) and car design.

On average 1.5 to 1.8 million vehicles are scrapped (dismantled, shredded) every year in France. A further 100,000 cars are abandoned in public areas (CNPA, 1992). When the EA on the treatment of end-of-life vehicles was signed in 1993, 75% of the total weight of an end-of-life vehicle was recycled. This percentage consisted mainly of re-used/spare parts and of the metal making up the car. Most of this went into metal recycling.

However, the trend for increased use of plastics in cars has been reducing the recyclability of end-of-life vehicles. Projections presented in the Information document from the EC's Priority Waste Stream's Working group on ELVs suggested that the plastic component would rise from 10% in 1985 to 13% in 1995, with a corresponding decrease in the iron and steel content from 68% to 63% by 1995 (see Table 1.1). A number of other environmental pressures reinforced the need for action. A law passed in 1992 (Law no: 92-646 of 13 June 1992) imposed a tax on landfilling and a ban on the landfilling of all waste except 'final waste' (*déchets ultimes*) from the year 2002. The law also places a priority on treatment and recovery. A law passed in 1995 introduced modifications to the tax provisions and imposed a tax on landfilling of 25 FRF (4 ECU) per tonne from January 1995. This will rise to 40 FRF (6.6 ECU) by 1998 and will then remain fixed until 2002.

Table 1.1: Materials Composition of European Cars, in % of Total Weight

Materials	1965	1985	1995
Plastics	2	10	13
Aluminium	2	4.5	6.5
Lead, Copper, Zinc	4	3	3
Steel and Iron	76	68	63
Others (Glass, Rubber, Paint)	16	14.5	14.5
Total	100	100	100

Source: Menges 1988, presented in the Information document from the EC's Priority Waste Streams Group on End-of-Life Vehicles

The car dismantlers, who receive the ELV from the final user, have a poor performance record on environmental issues. Although under the 1975 Law on Classified Installations, car dismantling sites should be approved by the DRIRE (the regional environmental regulator). In practice, many sites are not classified. The sector has many small actors (a total of 2,000 to 3,000), which are difficult to regulate due to the high costs of enforcement. There are about 900 classified sites in France, but the estimated total number of sites is in the region of 2,000 to 3,000 (Etienne Leroy, Pers. Comm., 1997).

There was also a need to address the growing problems faced by the scrap yards/shredders. The materials recovered were fetching an increasingly low price, while the increasing amount of plastic in cars was reducing the amount of material which could be recovered for re-sale. In addition, the price of landfill was rising and this put even more economic pressure on the sector. There were concerns about the effects of these pressures on the medium-term viability of the shredding companies. The collapse of this sector would have been disastrous for the supply chain as a whole (Interviews with Etienne Leroy, ADEME, and Mr de Tournemire, Ministry of Industry, 1996).

1.2.3 The Sector

The agreement covers all sectors involved in the manufacture and disposal of vehicles: material suppliers (steel, iron, plastics), components manufacturers, car manufacturers and importers, dismantlers, shredders and recyclers.

There are two large French car manufacturers – Renault and PSA (including Peugeot and Citroën) – which have about 60% of the market for new vehicles. However, since 1995, car importers have also been signatories to the agreement.

The steel sector is involved in the car chain, both as a materials supplier and as a user of recovered energy and material. The car sector

is the largest user of steel in France, accounting for four million tonnes of steel per annum. Usinor is the only steel producer in France, and is one of the largest producers in the EU (in 1994, it was the third-largest steel producer in the world). The car sector is its largest customer and accounts for 30% of sales. The Steel Makers Association (Fédération Française de l'Acier), which is a signatory to the EA, insisted on being included in the negotiations, when, initially, it seemed as though the steel manufacturers would not be required to participate.

The steel industry is involved in the recycling and recovery of steel from scrapped vehicles and energy from shredded waste (shredded waste from ELVs is used as a fuel to fire furnaces and the waste must meet certain criteria in terms of composition, if the sites using this fuel are to avoid classification as waste incinerators). Usinor Sacilor now have a controlling share in CFF (Compagnie Française de la Feraille). It is believed that the steel industry could benefit from increasing its control over the shredders to ensure a better quality of material for recovery and recycling.

Car manufacture accounts for 15% of sales of plastic in France. Plastic manufacturers are represented by the Syndicat des Producteurs de Matières Plastiques (SPMP) which is a signatory to the EA. The association has 25 members in France and 25 associated members who are importers. Between them, they account for 95% of the French market for plastics (in tonnes). Of the members, Elf Atochem is the largest, accounting for 50% of the market.

Plastic transformation and moulding is covered by the Fédération de la Plasturgie. Members include a few large companies (e.g. Plastic Omnium). In total, the association represents 1,500 companies, which have a labour force of around 100,000 people. There are many other companies in the sector who are not members of this association.

The car dismantlers are represented in the agreement by the Conseil National des

Professions de l'Automobile (CNPA), a large organisation covering 18 different professions involved in the car sector including dealers, garages, dismantlers, car rental firms, driving schools and so on. Overall, the association has 30,000 members, out of a total 60,000 actors in the professions covered. The members include 500 dismantlers, out of 900 registered sites. There are also a number of small, unregistered sites operating outside the law. This brings the estimated total number of actors in the dismantling sector to between 2,000 and 3,000 (Etienne Leroy, Pers. Comm., 1997). There is an overcapacity in the dismantling sector. Restructuring is inevitable, and this will lead to an increase in the proportion of dismantlers covered by the agreement.

The shredders and recyclers are represented by the FEDEREC (Fédération Française de la

Récupération pour la Gestion Industrielle de l'Environnement et du Recyclage). There are about 45 companies operating shredders in France. About 300 sites deal with ELVS, of which 20 have a large capacity. A large number of these sites are operated by one company, the CFF, which has around 50% of the market. The FEDEREC through its members covers about 95% of the shredding market.

It is also important to consider the main sources of ELVs entering the disposal chain. The rough breakdown by 'final owner' is given in Table 1.2 below. Insurance companies, the car dealer network and independent garages account for a large proportion of these ELVs. The dismantlers treat about 80% of these ELVs.

Table 1.2: Sources of ELVs — Last Owners

Last Owner	Number of ELVs per year	Percentage of Total (%)
Car Dealers	300,000	16.7
Individuals	300,000	16.7
Insurance Companies	500,000	27.7
Independent Garages	300,000	16.7
Car Pound	300,000	16.7
Government/Public Sector	100,000	5.6

Source: CNPA, 1992

1.3 Negotiation of the EA

Two important initiatives influenced the negotiation of the EA on ELVs in France: the EC's Priority Waste Streams Work on ELVs, and the threat of stringent legislation on ELVs in Germany.

Prior to the negotiations, a number of experts from organisations that are now signatories to the agreement were involved in the national or EU working groups on ELVs set up under the EC's Priority Waste Streams Work. The French government took the lead in co-ordinating this work at European level, and

established a shadow working group in France. This work allowed discussion and data collection on the issue of ELVs at EU level, and resulted in the production of a strategy document making recommendations at EU level for the car sector. This was published in 1994 and included targets to be met at EU level:

- a maximum of 15% landfilling of waste per car, for all cars, by 2002 at the latest;

- for models produced from 2002, no more than 10% landfilling of waste; and no more than 5% disposal by 2015.

These targets include the use of energy recovery, but the emphasis is on material recovery.

While this work on PWS was being undertaken, there were moves in Germany to introduce a regulation on ELVs. In 1990, there were indications that the German Environment Ministry was preparing legislation aimed at obliging car manufacturers to take back ELVs free of charge. A draft proposal, which contained these provisions, and required as much material recycling as possible, was issued in the summer of 1992. The French Ministry of the Environment, in a move to pre-empt German legislation, began preparing a decree on ELVs. The threat of this legislation and the need to address the threat posed by the German approach led car manufacturers to push for discussions on an EA with the French government (Whitson and Glachant, 1996).

The analysis of the French EA on ELVs by Aggeri and Hatchuel suggests that a regulatory approach to tackling the ELV problem would have been hindered by the uncertainties and complexities surrounding the issue and the possible approaches to tackling it. Industry and government faced 'shared uncertainty' with respect to the treatment of ELVs (Aggeri and Hatchuel, 1996). There was insufficient knowledge for the formulation of effective regulation and the situation was in a permanent state of flux. The treatment of ELVs requires the development of new technologies, sectors and firms and co-operation between the various actors involved while detailed technical and economic knowledge is required for the laying down of effective regulation. In this case, there were uncertainties about the effects of a strict regulatory approach, in particular in terms of restructuring the car chain, but also as regards the technical responses required to meet the targets agreed in the PWS work, especially as far as quality issues for material substitution,

re-use of parts and the economic viability of dismantling, recovery and recycling options were concerned.

For the French government, the need to minimise intervention and reduce the administrative costs associated with new regulations were also important incentives for the adoption of EAs (Pers. Comm., de Tournemire, 1996).

Other actors in the car chain are sensitive to the requirements of car manufacturers, who are important clients both through the purchase of materials and parts for the manufacture of vehicles and as a source of ELVs entering the disposal chain through their networks of dealerships and garages. In addition, the pattern of distribution of responsibilities for meeting the targets for ELVs has important implications for different groups of actors in the car chain because of the restructuring of the sector that such a distribution encourages (Whitson and Glachant, 1996).

1.4 Structure of EA and the Targets

There are 24 signatories to the agreement, representing all stages of the supply chain:

- the Ministries of Industry and Environment;
- French car manufacturers and 12 importers;
- trade associations covering the dismantlers, shredders and recyclers, material producers and equipment suppliers.

The agreement is based on the following three principles:

- a distribution of responsibility for meeting the objectives between the actors;
- respect for the free market;
- free choice between the treatment options: recycling, re-use or energy recovery.

The objectives cover the three main stages in the life of a vehicle:

- the design of new vehicles;
- the treatment of ELVs;
- the re-use or recycling of the waste materials.

The EA establishes quantitative targets for reductions in the weight of ELVs going to landfill. According to the definitions used for this study, this EA can be classified as a target-setting agreement, as the targets are not set by French legislation. However, they do correspond to those established in the EC-initiated work on Priority Waste Streams and were not altered through negotiation. The targets for 2002, of 15% disposal of landfilling for the average car (up to a maximum of 200kg) and of 90% recyclability of new cars correspond to the targets laid down in the strategy developed by the Priority Waste Streams working group on ELVs. The further target, of reduction to 5%, has been set for the long term, but no date has been set for achieving this. The targets indicated in the PWS ELV group strategy which suggests that they should be implemented across the EU, are as follows:

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

These targets include the use of energy recovery but the emphasis is on material recovery. The EA does not prescribe the means by which the targets must be achieved but deliberately leaves the choice open.

The agreement sets out objectives for the different groups of actors: the car and equipment manufacturers, the dismantlers, shredders and recyclers, material producers, and the authorities.

The EA does not have a legal basis. By signing the agreement, the industry associations and car manufacturing companies have made a moral commitment to reach the

targets. However, there is an implicit threat of action by the government in case of non-compliance with the targets and this could take the form of a regulation or tax.

1.5 Implementation

1.5.1 Enforcement, Sanctions and Incentives for Changes in Behaviour

The focus is on distributed, rather than shared, responsibility. This implies that actors undertake actions in their own field of expertise. A number of joint actions, involving different actors with different responsibilities in the car chain, are also taking place under the EA. Some joint actions were already underway before the EA was signed but since the start of the agreement, additional investments have been made. Renault, for example, has a specialised recycling unit with three main sections: the logistics of the waste treatment systems (dismantlers, shredders and recyclers); material and energy recovery and, in particular, the promotion of markets for the end products; and design. PSA has taken a different approach, that of co-ordinating the work of experts from the different departments in its two constituent companies, Peugeot and Citroen. It has concentrated its activities on the design of vehicles to increase the level of recycling and recovery possible. Both Renault and PSA are involved in joint ventures with other actors in the supply chain.

Many actors, especially the large companies, are driven by the threat of legislation in case of non-achievement of the targets. It is also in their interest to ensure the success of the EA and, thereby, to safeguard their own public image. The large manufacturers put pressure on the other actors to ensure that the criteria laid down are met. The car manufacturers have stated that their distribution and garage networks will use only those dismantlers who have obtained certification, and who are, therefore, considered to be complying with the EA on the disposal of ELVs. A similar commitment has been obtained from the insurance companies, although there are some

concerns that the current practice of auctioning damaged cars for the best offer may offer greater financial rewards than improved control of the dismantling sector (which would help reduce car crime). Together, the insurance companies and dealer networks account for over half the supply of ELVs for disposal. The PSA networks have Certification of the dismantlers is a key element in the success of the EA as it provides a means of, largely, excluding free-riders. The progress in certifying dismantlers is not as fast as was hoped; of the 700 to 800 companies targeted for certification, only about 20-25 (3-4%) have been certified to date. Therefore, those dismantlers who have invested in certification are not yet obtaining any benefits from their investment. Although the car manufacturers and insurance companies have stated that they will only deal with certified dismantlers, a critical mass of dismantlers must be certified so that the volume of ELVs generated by these groups can be handled effectively. The turning point will be reached when there are about 100 certified companies. Rapid progress is required to reach this critical mass.

The certification is for a 'contrat de service' rather than EMAS/ ISO14001 and, as such, focuses more on the service provided to the client than on environmental objectives but this has been modified, following recommendations from the ADEME, to include certain environmental requirements.

It is estimated that dismantlers will be required to invest between 400,000 and 1,500,000 French Francs to reach the standards required for certification. Many small companies will need to spread this investment over several years. The CNPA help scrap yards put together the paperwork for certification, with a pre-audit offered for a fee. Although dismantlers must be certified to ensure survival, there are still concerns about their being able to obtain a sufficient return on their investment. If the critical mass of certified dismantlers is not reached, or if insufficient ELVs are available to certified

recently issued a call for tender to dismantling companies and intermediaries to guarantee proper treatment of their end-of-life vehicles. Certification schemes have been established for the dismantlers, are being developed for the shredders, and are important in binding these sectors to the terms of the agreement.

dismantlers, an alternative solution must be considered. The following have been suggested by Aggeri (Pers. Comm., 1997): (i) a subsidy for investments required for certification, and (ii) mandatory certification to ensure that a critical mass is reached.

The Ministries have an important role to play through the threat of legislation and through the enforcement of existing legislation, particularly as far as the enforcement of certification requirements and ensuring the quality of the independent assessment body for the certification schemes for dismantlers and shredders are concerned. They also have an interest in controlling the sector to avoid the sale of scrap cars abroad, the re-use of registration papers from scrapped vehicles for stolen cars etc.

1.5.2 Monitoring, Reporting, Verification

A monitoring committee (Instances de Suivre) has been established to follow the progress of the agreement. Representatives of each of the signatories sit on the committee. Recently, following criticism of the lack of public scrutiny, a number of NGOs have been invited to attend certain meetings, as observers,.

The provisions for monitoring progress under the EA are poor. Although the first progress report was produced at the end of 1996, it did not include any comprehensive data for the sector on progress towards the targets. The information contained in the report refers to the actions undertaken by the parties, both individually and as joint actions, with some figures on technical progress through work at demonstration installations. Monitoring is being improved with the development of indicators of progress (developed with the assistance of the ADEME). There are two

main indicators: the proportion of ELVs being recycled and the recyclability of new models entering the market. From 1997 on, these will be used to monitor progress under the EA.

1.6 Outcome

There is no monitoring data available that provides sector-wide information on progress towards meeting the targets set in the EA. The first monitoring report, produced by the monitoring committee at the end of 1996, describes the actions undertaken by the parties to the agreement.

There has been a substantial increase in the activities to address the issue of ELVs since the signing of the EA, although a number of joint actions were already underway before that date. The following provides an overview of the types of activity undertaken.

1.6.1 Improving Car Design for Recyclability/Re-Use

The actors are working in collaboration in this area. The progress being made is described below. However, it is difficult to assess the impacts of the changes that are being introduced:

- Development of a Standard for Design of new cars – A French (AFNOR) Standard on the ‘design of vehicles to optimise their recycling/re-use at end-of-life’ is currently in the pilot stage (Standard R10.402, disseminated in 1996). This standard is aimed at simplifying and enabling depollution (draining of fluids..), removal of parts prior to crushing, crushing and separation of materials, and treatment of the various fractions obtained. The manufacturers are producing technical guidance sheets on the dismantling of non-metallic components.
- Labeling of components – according to the ISO standard developed to aid recovery at EU level.
- Facilitating and speeding up the dismantling of pieces – to make recovery economically viable.

- Choice of materials for use in cars on the basis of their recyclability.
- Integration of recycled materials into new cars.

1.6.2 Treatment of ELVs

As described in Section 1.2.2, the French dismantling sector is generally considered to have a poor environmental performance record. The sector includes a large number of small, unlicensed sites which do not comply with legal environmental requirements. Dismantlers treat 80% of ELVs.

The car sales networks and insurance companies have stated that they will use only certified dismantlers. A certification system is currently being implemented (see Section 1.5). The EA is considered to have led to the more rapid implementation of the certification system for dismantlers (French Ministry of Industry). A certification scheme would have been adopted without an EA, but over a much longer timescale.

Restructuring of the dismantling sector is inevitable, with or without the EA, if environmental improvements are to be achieved. The dismantlers have to make substantial efforts (including significant investments – see Section 1.5) to reach the requirements of the EA. It is clear that the EA has required more openness and this has the benefit of increasing the exchange of information. It has also led to increased recognition of the dismantler’s role in the chain, especially by the larger companies. However, it may make dismantlers more vulnerable to attempts by the car manufacturers to control the market for spare parts. In addition, the shredders have an interest in integrating the dismantlers’ activities into their own sector. This has happened in the Paris region.

Car manufacturers are trying to make cars easier to dismantle, and are producing technical guides for individual models for dismantlers, to allow easier identification and recovery of valuable and recoverable parts. There is a trade-off between the weight of a

part and the time needed to remove it from an ELV. If the part is too light, it is not worth the time spent in recovery in terms of the price of the material recovered.

1.6.3 Recycling and Re-Use Options

A variety of activities have been undertaken to improve the profitability of recycling and re-use of different components and materials, including work on separation to improve the

quality of materials recovered and of fuel for energy recovery and actions to guarantee markets for recovered materials and energy. A specific example includes the work carried out by the CFF at a pilot centre at St Pierre de Chandieu (a joint venture with PSA). Between 6,000 and 7,000 vehicles have been treated at the centre, demonstrating that it is technically

Table 1.3: Results from Tests Carried Out at St Pierre de Chandieu on ELV Treatment

	Proportion of weight (%), excluding fuel (petrol/diesel)
De-pollution (draining fluids, removing battery)	2.5
Disassembly (removing spare parts)	9
Metal recovery	75
Fuel-substitutes for combustion	7.5
Landfilled	6

possible to recycle or recover 94% of the components of an ELV. The breakdown of components is given in Table 1.3. However, efforts are still required to make the techniques used economically viable.

Other specific examples of measures aimed at developing re-cycling and re-use include:

- Usinor-Sacilor have been carrying out research into shredding and the recovery of energy from waste. They have also been involved in the development of a common code for different types of steel, including scrap from cars, to facilitate its sale and re-use across the EU.
- Car material and parts suppliers are also working with the shredders to improve the quality of shredded material for energy recovery. This is in the interest of the waste-users and the shredders.
- Plastic manufacturers are making contractual agreements to buy steam produced through the combustion of plastic

waste, to guarantee a market for the energy recovered.

There is also a certain amount of overlap between the three areas of activity reviewed above. For example, the Renault recycling unit has been working on a variety of projects involving different actors from the car chain, aimed at increasing the economic viability of re-use and recovery. This has included the development of a number of specialised tools to facilitate and speed up the manual disassembly of parts, reducing the dismantling time and increasing the profitability of re-use and recycling.

1.6.4 Other Outcomes

Although there has been information exchange and dissemination between the parties to the EA and their members (e.g. through joint actions, quality standards relating to the design of vehicles, and the technical guides developed for individual car models for use by dismantlers), the

information made available to the public has been limited. Recently, following pressure for more transparency, some NGOs (environmental and consumer groups) have been invited to act as observers at meetings.

1.7 Assessment of Effectiveness

1.7.1 Assessment of Environmental Effectiveness

1.7.1.1 The Reference Situation

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

1.7.1.2 The Target

Although the targets in the EA are not set in French legislation, the targets for 2002, of 15% disposal of landfilling for the average car and of 90% recyclability of new cars, correspond with the targets in the ELV strategy from the Priority Waste Streams initiated by the European Commission. The ELV expert group set up in 1991 (and coordinated by the French) published a strategy in 1994 which indicated the following targets for the sector at EU level:

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

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

1.7.1.3 The Baseline

Business as Usual

The EA addresses the responsibilities of different actors in the car chain. The baseline must cover both the proportion of vehicles currently reaching their end-of-life which is being re-used/re-cycled and changes in the

design of vehicles to improve their re-use and recyclability at end-of-life.

There are data available on past and expected future, changes in the materials used in cars by weight (for example see Table 1.1 in Section 1.2.2) and these give some indication of the amount which can be recycled under current technical and economic conditions. However, at present, there are no quantitative monitoring data on improvements in the design of new vehicles.

The data available are insufficient to establish a pattern over time in the proportion of end-of-life vehicles being recycled and re-used. This is likely to vary slightly with changes in the price of recycled materials, which make dismantling and recovery more or less profitable, and with technical developments in separation and recycling techniques.

The baseline will be influenced by two factors, which have opposite effects:

- the trend towards the increased use of plastics in cars which would reduce the recyclability of end-of-life vehicles. Projections presented in the Information document from the EC's Priority Waste Stream's Working group on ELVs suggested that the plastic component would rise from 10% in 1985 to 13% in 1995, with a corresponding decrease in the iron and steel content from 68% to 63% by 1995.
- a law passed in 1992 (Law no: 92-646, of 13 June 1992, modified in February 1995) which established a tax on landfilling of 25 FRF (4 ECU) per tonne from January 1995, rising to 40 FRF (6.6 ECU) by 1998, and a ban on the landfilling of all except 'final waste' from the year 2002. This will promote the incineration of shredder residues from end-of-life vehicles, with some energy recovery (which is recognised as one means of achieving the targets set in the EA).

It is not possible to determine the scale of these different, contradictory effects. In addition, although the environmental

agreement was negotiated as a result of the threat of regulation by the Ministry of the Environment, there is no information available about the provisions that would have been adopted if there had been regulation.

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 effects that decree would have had.

1.7.1.4 Environmental Effectiveness

There are no quantitative monitoring data at present that allow measurement of progress against the business-as-usual baseline for the average ELV. However, results from trials and demonstration activities, undertaken by the parties to the EA, demonstrate the technological possibilities and progress towards the achievement of the objectives for a small sample of vehicles. Tests have shown that it is technically possible to recover or recycle about 94% of the weight of ELVs. Many measures are underway to improve the recyclability of cars but the impact of these is difficult to assess in quantitative terms.

The EA has led to the creation of new working relationships between actors from different branches of the car sector. These actors did not work together in the past. The process of the EA (signing an agreement along with other actors and holding regular monitoring meetings) opens up new possibilities for an exchange of ideas and information.

1.7.2 Assessment Against Wider Impacts

1.7.2.1 Cost Effectiveness

The EA distributes responsibility for meeting the objectives between the parties, according to their areas of expertise, in order to make the best use of the knowledge and skills available. The EA represents a voluntary 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. 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 actors in the car chain.

The focus of the EA is on changes in car design to improve the recovery of materials and on incremental improvements to the existing, mainly manual, dismantling approach, to improve the technical and economic feasibility of ELV recycling (e.g. changes in car design and dismantling tools to reduce the cost of recovering parts). This contrasts strongly with the mechanised dismantling chains being developed in Germany and the Netherlands. It requires less capital investment and is, arguably, better adapted to the diversity of ELVs entering the dismantling chain.

Through the increased collaboration between actors, described above, it is expected that cost savings can be achieved. However, there have been no estimates of these savings. The EA allows for cost-sharing, in as much as each actor has responsibility for initiatives in its area of expertise. However, one of the large car manufacturers has adopted a more integrated approach. This could have the effect of co-ordinating actions to a greater extent and reducing costs further. Efforts are also underway to assess and develop new markets for recycled products, to improve the incentives for recycling and to introduce solutions which are economically viable.

There will be some restructuring of the dismantlers' and shredders' sectors. This is inevitable and would also have been required for the successful implementation of a tax or regulation. Other sectors may benefit from this. For example, the steel company USINOR-SACILOR will benefit from increased control over shredders, as this will help them to ensure that the recycled metal entering their systems is of a higher quality.

1.7.2.2 Technical Change/ Innovation

The approach taken under the French agreement has been to focus on improving the recyclability of new models through design and incremental improvements to the existing labour intensive 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. This contrasts with the approach taken in the Netherlands and Germany where new mechanical dismantling chains have been

Certification schemes, being implemented for dismantlers and being developed for shredders, will favour more responsible agents. The French EA has served as a model for similar EAs on ELVs in a number of other EU Member States. (e.g. Spain and Portugal). It may also serve as an example for other EAs in France.

1.8 The Future

A certification scheme is being developed for the shredders, as described in Section 1.5. When this scheme and the certification scheme for dismantlers are running as planned, a large proportion of the ELVs generated in France will be treated by certified dismantlers and shredders meeting minimum environmental requirements and this will lead to an improvement in environmental performance for the treatment of ELVs. However, until now, progress in certifying has not been as fast as expected (see Section 1.5) and only 3-4% of the dismantlers are certified.

The monitoring provisions under the agreement have been improved, with expert assistance from the ADEME, to develop quantitative indicators of progress. However, the first measurement of these indicators will be made this year to give a baseline, so that the first estimates of progress will be available next year.

The policies adopted for ELVs at European level and in other Member States will affect

developed. The parties interviewed consider that a manual approach is better suited to dealing with the diversity of ELVs for disposal.

1.7.2.3 Other Outcomes

The ELV dismantling and recycling industries are an important source of employment for unskilled workers in France. Maintaining employment in the sector is an important objective for the French government since 20% of employment in France is associated with the car sector as a whole.

the development of recycling and recovery options under the French agreement. The Dutch and German agreements are considered by many French actors to pose a threat to the French agreement (Pers. Comm. de Tournemire, Ministry of Industry, 1997; Pers. Comm. Vallat, Renault, 1996). The German charge on disposal of ELVs, paid by the final owner, will, it is thought, lead to imports of ELVs into France.

1.9. Conclusions

Quantitative assessment of environmental effectiveness is not possible because of a lack of monitoring data. However, monitoring arrangements are being improved. Tests on a pilot scale show that the targets for recycling, re-use and energy recovery for 2002 are technically feasible and that current technology is close to making the long-term targets of 5% landfilling possible. However, some trade associations and independent experts are more sceptical as to economic feasibility. A number of actions are underway to improve the economic viability of re-use, recycling and energy recovery.

The EA provides a new policy approach, which has resulted in increased consultation between partners, greater information exchange and many joint actions. It is also likely to achieve environmental improvements and cost savings. It is not possible, however, to determine whether it is more cost-effective than alternative policy measures.

1.10 Information Sources

(I= face-to-face interview, T= telephone)

NGOs	Companies
Mr Bonnemains (T) Robin des Bois	Mr Bernard Gros (I) Usinor Sacilor Direction Centrale Ferailles et Recyclage Responsable Recyclage
Public Authorities	Mr Vallat (I) Régie Nationale des Usines Renault SA Recycling Unit
Mr Appriou Ministère de l'Environnement (T)	Mr Eric Georges (I) PSA Peugeot Citroën Direction de la Division Automobile
Mr de Tournemire Ministère de l'Industrie	Mr Derek Wilkins (T) Programme Manager Care Programme Rover Group
Mr Etienne Leroy (I) ADEME Direction Industrie Secteur Automobile	Trade/Industry Associations
Academics/Researchers	Mr Thierry Legait (I) FEDEREC Président
Mlle Ysé Serret (T) Centre International de Recherche sur l'Environnement et le Développement (CIRED)	Mr Roland Rugliano (I) Commission Technique, Délégué Environnement Syndicat des Producteurs de Matières Plastique (SPMP)
Frank Aggeri (Written Communication) Centre de Gestion Scientifique (CGS) Ecole de Mines de Paris	Mr Guillaume de Bodard (I) Responsable Qualité de l'Environnement Conseil National des Professions de l'Automobile (CNPA)

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2. Case Study 2

Sweden: Agreement on Producer Responsibility for Packaging*

2.1 Summary Information on EA

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

ρ The Environmental Issue	Collection, recycling and material recovery of waste from packaging
ρ Target	Targets for re-use or re-cycling, by January 1997, from the Ordinance on Producer Responsibility for Packaging: – 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
ρ Start Date	1 October 1994
ρ Timescale	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.
ρ Number of Signatories	8,200 companies have registered with the 'REPA' scheme, established through a voluntary industry initiative, 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.
ρ Parties	Producer companies (manufacturers, importers and sellers of packaging or packaged goods) register with the appropriate materials companies via Reparegistret, set up under the EA.
ρ Type of EA	Implementation Agreement, for Ordinance on producer responsibility for packaging
ρ 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 set out above and provide data to the EPA. The Ordinance is enforced by the municipalities and the EPA.
ρ Other provisions/ principles	5 separate companies established under the EA, each to ensure collection and recycling of different materials, allowing competition between the materials on the basis of cost. Registration and collection is administered by a general company Reparegistret (or REPA). A second company is responsible for information. These two general companies are owned by the five material companies.
ρ Legal Basis	System voluntarily established by the Trade Associations, recognised by government, implemented through non-profit making companies which form commercial contracts with each producer firm.

* The case study was revised by Helen Ågren (AFR, Naturvårdsverket, Stockholm).

2.2 Background and Context

2.2.1. The Country Context

A system for the collection, re-use and recycling of packaging waste (the so-called REPA scheme) was established by a group of producer representatives in response to an ordinance on producer responsibility for packaging wastes issued in 1994.

Although the Swedish Parliament first recommended legislation on producer responsibility in 1975, it was only introduced into Swedish law with the Ecocycle Bill in 1993. The Ecocycle Bill is aimed at improving the management of materials so as to reduce the high consumption of material resources and mitigate associated environmental impacts, through the re-use, recycling and recovery of energy from materials. The provisions of the Ecocycle Bill were enforced through the 1994 Ordinance on producer responsibility for packaging. The Ordinance requires producers, including manufacturers, importers, producers of packaged goods and retailers, to collect, re-use and recycle packaging waste.

The Ordinance sets out targets for different packaging materials, based on those laid down in the Ecocycle Bill to be achieved by January 1997. The bill also establishes the following waste treatment hierarchy:

1. re-use,
2. material recovery,
3. energy recovery, and then
4. landfill.

However, it is clearly stated that the method which makes the best use of resources should be chosen. The ecocycle law provides the government with a mandate to demand more producer responsibility where this can lead to resource use which is environmentally beneficial and technically and economically viable.

Public and company awareness of environmental issues is generally high in

Sweden. There is strong public support for measures to tackle waste issues (demonstrated by the good response to the user delivery system for collecting glass which has been in operation since the 1980s) and industry acceptance of the principle of producer responsibility for waste.

2.2.2 The Environmental Issue

The driving factor behind the Ecocycle Bill, the resulting Ordinance and the REPA scheme is the need to transform society from a throw-away society with high consumption and negative environmental impacts to an 'ecocycle' society (see Svenska Kommunförbundet, 1995, and Swedish EPA factsheet). The legislation was also developed against the background of discussions on the EU Directive on Packaging and Packaging Waste (94/62/EC), which came into force at Member State level at the end of June 1996. The Directive sets targets for the year 2001 of between 50 and 65% of materials to be recovered and between 25 and 45% to be recycled. A minimum of 15% by weight of each material type must be recycled.

The aim of producer responsibility, laid down in the Ecocycle Bill, is to reduce the amount of packaging waste by reducing the use of packaging and promoting re-use of the waste. Producer responsibility is seen as providing incentives for:

- cleaner production;
- the development of products with a better environmental performance;
- recycling and re-use of materials and improved use of waste products;
- minimising the use of landfills.

Producer responsibility is seen as a good means of implementing the 'producer pays' principle, encouraging a market-based approach to tackling the issues of packaging waste and its disposal (Baumann, Pers. Comm., 1997).

There is concern over the potential harmful impacts associated with landfills and reducing

the use of landfills is one of the goals of national environmental policy. There is also some concern amongst sections of the public over the environmental impact of the incineration of waste. (Norrman, Pers. Comm., 1996). There are currently 21 waste incineration plants in Sweden, all with energy recovery programmes. In 1994, 1.2 tonnes of MSW were incinerated. The targets set in the Ordinance are to be met through material recovery.

Packaging waste accounts for about half of all municipal solid waste. Table 2.1 shows the amount of packaging used in Sweden in 1991 (taking account of imports and exports) and the breakdown of the different materials used.

The Swedish Environmental Protection Agency carried out a study to assess the targets set in the Ecocycle Bill, using life-cycle assessment, to try and establish the optimal level of re-use, recycling and energy recovery. This resulted in recommended targets for 1997 which were less stringent than those suggested in the Bill, to allow a gradual build-up of an effective collection and

recycling system and to avoid failures due to over-ambitious objectives and any resulting loss of public confidence.

2.2.3 The Sector

A large number of companies are affected by the legislation, and are being recruited to the environmental scheme. A producer is defined as anyone who commercially manufactures, imports or sells a product. In this case producers include packaging manufacturers, importers of packaged goods, manufacturers using packaging and retailers.

The Association of Swedish Industries has 6,000 members (including all large companies) which account for between 85 and 90% of output and 20% of employment in Sweden. This excludes wholesalers and retailers who are represented by a separate association. The Consumer Co-operative Union represents the interests of consumers but also owns a number of retail outlets, with a 20% share of the market for daily commodities.

Table 2.1: Breakdown of Packaging Materials Used in Sweden, 1991

Material	Packaging Produced	Imports of Filled Packaging	Exports of Packaging	Total	Proportion of Packaging (%)
Cardboard and Paper	268 957	58 000	40 000	286 957	21.6
Corrugated Cardboard	280 297	87 000	60 000	307 297	23.4
Plastic	174 500	85 700	54 400	205 800	15.5
Steel	54 671	42 000	7 626	89 045	7.4
Aluminium	24 270	8 864	2 308	30 855	2.3
Glass	157 000	77 200	41 000	223 200	17.0
Textiles				3 000	0.1
Wood	169 200	10 800	5 400	174 600	13.5
Total	1 128 900	369 300	212 200	1 319 000	100

Source: Swedish EPA (Naturvårdsverket), *Producentansvar- det första steget, rapport 4518*, taken from Källa: Packa-Forsk (1991).

Swedish companies are considered to have a high level of awareness of environmental issues, and large companies tend to be active in improving their environmental performance. There is a strong incentive to portray a green image.

The existing municipal waste collection system is operated by the municipalities. There are 288 municipalities in Sweden, all members of the Swedish Association of Municipalities, the Svenska Kommunförbundet. The municipalities have a high degree of autonomy, through a highly decentralised system where many issues are decided, funded and managed at the local level.

2.3 Negotiation of the EA

The REPA scheme was established by representatives of the sectors affected by the Ordinance on Producer Responsibility for Packaging by the Ministry of the Environment. The Association of Swedish Industries had established a Packaging Council in response to the proposed Ordinance, to discuss solutions for dealing with packaging waste. Representatives of all sectors and major companies affected by the proposed legislation were invited to attend, including non-members of the Association such as the retailers and wholesalers. The Council attracted around 40 participants and lasted about two years.

The Packaging Council was in favour of the ecocycle approach and producer responsibility but wanted the freedom to determine the means by which the targets set should be met. In particular, the representatives were keen on establishing control over the whole waste stream, including collection, so as to control costs. If industry is to be responsible for the cost of collection, it wants to control that cost. As the targets set are at a national level, industry was also keen to have a national collection, re-use and recycling system and to move away from the existing local approach (Jobin, Pers. Comm., 1996). Retailers were

keen to be involved so as to influence the outcome of the process.

The Swedish Industry Association proposed the creation of material companies, each responsible for the collection, recycling and re-use of one material type. These companies were set up as non-profit-making joint ventures. The Council decided on the most appropriate ownership structure for each material company. Industry's proposal was accepted by the Ministry of the Environment.

Under the Ordinance, each producer must make provisions for the collection and re-use/recycling of the packaging it produces or uses. Each company has the choice of either paying a fee to the appropriate materials company to undertake this task on their behalf or setting up their own system.

The move by industry was based on: an acceptance of the targets set in the Ordinance, the legal requirement to meet these targets, and the need to control the whole system of collection and re-use/recycling to ensure that it would be achieved at least cost to industry. It was concerned that, if the existing system of collection by the municipalities were continued and developed, industry would not be in a position to control the costs and quality of the collected waste material. In the absence of a system for spreading responsibility for managing packaging waste, the burden of complying with the Ordinance would probably have been borne by the retailers.

The producers were also concerned about the costs of waste collection and treatment, which would be pushed up by separate collection, re-use and re-cycling. It was important for them to have control over these costs, rather than have a charge imposed by municipalities or central government.

The government was keen for industry to assume responsibility for the cost of the collection system so as to encourage an efficient use of packaging materials. As mentioned in Section 2.2.2, producer responsibility is seen as a means of

implementing the 'producer pays' principle. Some respondents pointed out the potential advantages of a market-based approach, in allowing competition between treatment options, to provide a more efficient solution (Baumann, 1997).

The retailers, including the consumer co-operative union, were involved in the Packaging Council set up by the Association of Swedish Industries, although they feel that the interests of the packaging industry were more strongly represented. The consumer co-operative union (the consumer association) and other NGOs were not involved in the negotiation of the agreement. Indeed, there are some doubts about whether NGOs could become involved in the negotiation of EAs in general, because, as Mr Berkow of the Swedish FoE pointed out, they have limited resources. Participation in the relatively time-consuming negotiation processes required for establishing EAs may not be possible for them, as it would involve reducing the time input to other core activities which are likely to take priority.

2.4 Structure of EA and the Targets

2.4.1 The Targets

The Ecocycle Bill (Government Bill 1992/93:180 on Guidelines for Societal Development in Harmony with the Ecocycle Principle) sets recycling targets for packaging. A number of actors interviewed agreed that the targets were political in nature. The centre and green parties were keen to establish stringent legal requirements for producer responsibility for packaging, with ambitious recovery and recycling targets (Jobin, Pers. Comm., 1996; Baumann, Pers. Comm., 1997).

The Swedish Environmental Protection Agency conducted a number of studies including: life-cycle assessments, to assess the environmental effects, cost effects and technical options for these targets. The EPA suggested a softening of the targets for 1997.

Table 2.2

Targets Set Under the 1994 Ordinance on Producer Responsibility for Packaging

Material	Target for January 1997* (%)
Aluminium – other than beverage containers	50
Card, paper or cardboard	30
Corrugated paper	65
Plastic other than PET beverage containers	30
Steel	50
Standardised glass bottles for beer and soft drinks	95
Glass bottles for wine and spirits filled in Sweden	90
Other glass containers	70

Source: Swedish Ordinance on Producer Responsibility for Packaging, 1994.

*Note: Based on material recovery

This was based on an assessment of the technical feasibility of reaching the targets for plastics and led to the target being reduced to 30%. In particular, the EPA was concerned that, in trying to move ahead too quickly, mistakes would be made and there would be insufficient time to develop a truly operational system across the country. Since a drop in confidence in the system would cause long-term damage to the public's willingness to participate by bringing waste packaging to the central collection systems, forcing the pace of the build-up could be costly.

The Packaging Ordinance came into effect on 1 October 1994. It set targets for the end of January 1997 which are lower than those set in the Ecocycle law (see Table 2.2). This is due to the Environmental Protection Agency's concern that the targets in the law were too ambitious for such a short timescale and that failure to meet the targets, or a lack of capacity for recycling collected material, would damage public commitment to collection. However, a second ordinance has been issued, with the targets being those set out in the Ecocycle law. However, industry is concerned that this second ordinance was issued without renewed consultation.

2.4.2 Structure and Coverage

The agreement takes the form of a system which allows the targets and requirements of the Ordinance to be met by companies. Companies are required by law (under the Ordinance) to make provisions for the collection, re-use and recycling of their packaging materials, and to report to the EPA on the use and collection of packaging. Under the system, so-called 'materials companies' (each covering a different type of packaging material) operate collection and treatment schemes across the country. For a fee, determined by the amount and type of packaging used by the producer, each firm can register with the appropriate materials companies, who undertake to meet the company's legal responsibilities as established under the Ordinance. Registration with these

materials companies is voluntary, although the companies are obliged to meet the requirements of the Ordinance on Producer Responsibility for Packaging.

Five materials companies are operating under the Environmental Agreement. Two separate companies were also set up to co-ordinate registration and information activities for the material companies – one to take responsibility for administering the membership and payments to the scheme (Reparegistret AB, or REPA for short), the second to deal with the dissemination of information and to negotiate with municipalities.

Four new companies were set up to manage paper and cardboard, corrugated cardboard, metals and plastics. They are listed in Table 2.3 with details of their ownership structure. The companies are non-profit-making joint ventures between those companies and organisations which are most involved in the production, collection and treatment of that particular type of packaging. An existing company (Svensk Glasåtervinning AB) is responsible for the collection and recycling of glass not covered by deposit refund schemes. It has been operating since the mid-1980s. The four newly-established companies were intended to have an ownership structure with an equal distribution of ownership and control between three groups: the Packaging Industry, the Fillers and the Retailers. However, this does not always apply in practice with the plastics company having a larger contribution from the plastics industry than from fillers and retailers. The glass company was established prior to the agreement and, therefore, has a different ownership structure.

2.5 Implementation

Every producer who joins the EA registers, through REPAREGISTRET (REPA for short), with the materials companies that deal with the materials it uses in its packaging. Registration with REPA is voluntary.

Table 2.3: The Material Companies, with Details of Ownership Structure

Material	Company Name	Owners*
Paper and Cardboard	Svensk Kartongåtervinning AB	Iggesund Paperboard Frövifors Bruk STORA Billerud Korsnäs Fiskeby Board Munksjö Svenska Kartongpackföreningen
Corrugated Board	RWA Returwell AB	Assidomän SCA Packaging Munksjö Svenska Wellpappföreningen Sveriges Möbelindustriförbund
Metals	Svenska MetallKretsen AB	GM Lysekil Hydro Aluminium Packaging Ulricehamns Bleck Sveriges Färgfabrikanters Förening
Plastics	Plastkretsen (PK) AB	Plastbranschens Informationsråd Svenska Petroleuminstitutet

In addition the following are part-owners of all the materials companies:

Sveriges Livsmedelsindustriförbund, Dagligvaruleverantörers förbund, Dagligvaruhandelns Utvecklingsråd (ICA, KF, DAGAB, Livmedelshandlarna, Grossistförbundet Svensk Handel, Sveriges Köpmannaförbund.

However, all companies who produce, use or sell packaging must provide a system for the collection and recycling or re-use of that packaging and report to the EPA. If they are not registered with the materials companies via REPA, they must have established an alternative system. This provides a strong incentive to register under the REPA scheme.

There is a one-off affiliation fee of SEK 400, and fees for the different types of packaging based on the amount used. For companies with a turnover below SEK 3 million, a standard annual charge can be paid instead. This amounts to SEK 500 per year for a turnover below SEK 0.5 million, and SEK 2,000 for a turnover between SEK 0.5 and 3 million.

One criticism of this structure is that steel and aluminium are covered by one metals company, and that the fee paid is the same for aluminium and steel. This does not allow any competition between these two materials in terms of cost and, so, does not provide incentives for producers to switch materials

on the basis of the costs of recycling and disposal (Baumann, Pers. Comm., 1997).

The materials companies provide collection bins for the centralised collection of packaging waste. They have awarded contracts, through an open tender process, to private companies or municipalities for the collection and treatment of the waste. The tendering process ensures that the services are provided at a reasonable cost.

The material companies provide the collection bins but must agree with the municipalities on the number and location of these bins or collection points. There has been some debate over this issue of numbers and siting. Although the material companies need to meet the targets set in the Ordinance, the provision of more bins increases their investment and collection costs. Municipalities are still responsible for the door-to-door collection of municipal solid waste; the less packaging waste collected, the higher their costs. The companies originally intended to provide one collection point per 10,000 inhabitants. Some municipalities have

negotiated the provision of one per 1,000 inhabitants. Larger municipalities have a greater bargaining power, as they have a density of population that allows the material companies to improve their progress towards the Ordinance targets at a lower cost.

Planning permission must be obtained for a collection point. Municipalities can refuse permission if they are not satisfied with the quality of the site. There is also some discussion about who should pay for the land on which collection points are located. Many municipalities provide the land but their representatives are keen for rent to be set for the land (even if the rent is set at SEK 0), to avoid setting a precedent.

Table 2.4: Packaging Fees

Material	Fee
Metal	100 öre/kg
Plastics	150 öre/kg
Paper/ board	40 öre/kg
Corrugated board	12 öre/kg

2.5.1 Enforcement and Verification of Progress

Companies are required by law to make provisions for the collection, re-use and recycling of their packaging materials. The municipalities are responsible for ensuring that companies comply with the legislation. However, the EPA is also targeting a number of companies (large and small) who have not registered under REPA, to ensure that they comply or register.

Enforcement is also encouraged through pressure applied through the supply chain. There are three main, large food retailers in Sweden. These companies require all their suppliers to register with REPA. Although the Ordinance is enforced by the municipalities, anyone (retailers, the public...) can contact REPA to find out whether a company is registered.

The EPA is also responsible for verifying progress towards the targets set at a national level. REPA itself checks the information provided by companies, especially where this suggests a use of packaging which is below average for the sector (Ankers, 1996).

2.5.2 Other Activities

The different producer groups are brought together on the boards of the different materials companies. This allows communication between the different sectors covered by the agreement and provides an opportunity for all sectors to influence decisions. The retailers also have a national network which meets regularly to discuss issues associated with packaging waste and this provides an important forum for the exchange of information and experience.

2.6 Outcome

To date, 8,200 companies are registered under the REPA scheme, accounting for 85% by weight of all packaging used in Sweden. REPA aims to increase registration with the materials companies further, particularly among small companies since many of those who are not complying with the terms of the Ordinance on producer responsibility for packaging are SMEs (for example small retail outlets).

Table 2.5 shows the progress made by 1995 in meeting the targets. A final report on progress under the 1994 Ordinance will be submitted for the target date of January 1997. However, this information is not yet available. The EPA are unable to assess the success of the Ordinance and the REPA system until they receive this data. The data for 1995 shows that progress for plastics is poor. The plastic and metal materials companies have been slow in establishing collection points. The provision of more bins will improve the collection.

National data on the baseline situation is poor. The Ordinance, by requiring companies to report the amount of packaging used and

the amount collected and re-used/recycled, will provide valuable data.

Table 2.5: Progress Under the Swedish EA by 1995, Compared to Baseline and Targets

Material	Level of recycling and re-use (%)		Target for January 1997 (%)
	Estimates for 1992	1995	
Aluminium – other than beverage containers	-	1-5	50
Card, paper or 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.

2.7 Assessment of Effectiveness

2.7.1 Environmental Assessment

2.7.1.1 The Reference Situation

Estimates for recovery and recycling of certain materials covered by the EA exist for 1992. No information is available for metals, plastics or card, paper and cardboard (See Table 2.5).

2.7.1.2 The Targets

The targets set in the Ordinance on producer responsibility for packaging were set following studies coordinated by the Swedish EPA, including life-cycle assessments. The timescale (two years and four 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.

2.7.1.3 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 being considered 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 as the basis for the environmental assessment.

2.7.1.4 Environmental Effectiveness

Estimates of progress (Table 2.5) show an increase in the rate of recycling for two of the three 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. This accounts for the 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 because of a lack of data for the reference year (1992).

REPA (The Swedish Packaging Collection) 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 were not available. The figures for 1996 have not yet been published.

It is important to note that these data reflect progress 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.

2.7.2 Assessment Against Wider Impacts

2.7.2.1 Cost-Effectiveness

The industry associations interviewed consider that the agreement, by allowing industry, through the competing materials companies, to control the costs of collection and treatment, with open tenders for services, will enable targets will be met at a lower cost to industry than under the existing municipal collection system.

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 a perceived threat to jobs associated with municipal waste collection.

The REPA scheme should allow target-sharing between companies for given materials, by spreading the costs of collection and treatment over many firms, and allowing savings through economies of scale. In addition, the fact that there are separate

companies responsible for the different materials, allows for competition between different types of materials, preventing cross-subsidisation between materials activities and allowing packaging users to opt for the least costly material.

However, the treatment of aluminium and steel together under one company with one fee limits competition between these metals.

2.7.2.2 Technical Change

There is no evidence to date that the agreement has resulted in technical change. However, the agreement has been in operation for just over two years. More time is required to identify any impacts on technical change and to isolate the effects of the agreement from other effects such as Sweden's accession to the EU. There is also no evidence of an impact on trade.

2.7.2.3 Other Outcomes

If the targets in the Ordinance are met through the EA, Sweden should meet the targets in the EU Directive on Packaging and Packaging Waste (94/62/EC) ahead of the deadline of 2001. Although there have been some free-riders, because of the large number of companies affected by the Ordinance and, therefore, eligible to join the REPA scheme. These are mostly small companies. Free-riders would also have been a feature of the previous system.

2.8 The Future

The initial ordinance on producer responsibility for packaging has been adapted to include a requirement for the material companies and municipalities to work together to address the sometimes controversial issue of the number, location and costs of the central collection points for packaging waste. This is in response to a number of disputes in certain municipalities.

The ordinance on producer responsibility for packaging set targets for January 1997 and is, therefore, drawing to a close. A revised ordinance, which sets stricter targets for the

year 2000, is being implemented. These targets correspond to those established in the Ecocycle Bill passed in 1993, although industry is concerned that there has been no new consultation between government and industry on these new targets. The REPA scheme, the voluntary system established by industry to meet the requirements of the first ordinance, will continue.

2.9 Conclusions

Progress in moving towards the targets in the Ordinance is mixed, but the assessment is based on data from early in the life of the EA. The ordinance on producer responsibility for packaging allowed a relatively short timescale for achievement of the targets. The EA system has been in operation for just over two years. Progress in achieving the recovery and recycling targets for metals and plastics may also have accelerated since 1995. The

collection rates for plastics are likely to improve as more collection sites are established.

The view of the stakeholders is that the REPA scheme and materials companies allow the Ordinance on producer responsibility for packaging to be implemented more efficiently than it would be under many other options (such as the DSD system in Germany). It is likely, given the cost-savings, that the EA has been more cost-effective than the existing municipal collection scheme. On the other hand, the system also imposes some external costs to the public which brings the waste to the collection points.

However, assessments of the environmental effectiveness of the agreement is limited by the limited amount of baseline data. It is also too early in the life of the EA for an accurate assessment of its wider impact.

2.10 Information Sources

Public Authorities	Materials Companies
Ylva Reinhard (I) Swedish EPA	Mr Mikael Ankers (I) Director Reparegistret AB
Maria Milberg (T) Environment Ministry	Associations
NGOs	Mr Bengt Jobin (I) Dept. Director Environment and Energy Department Federation of Swedish Industries
Per Baumann (T) Environmental Coordinator Consumer Co-operative Union	Mr Jonas Norrman (I) Environmental Division Svenska Kommunförbundet (Swedish Association of Local Authorities)
Charles Berkow (T) FoE Sweden	I= Interview, T= Telephone

References

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Swedish Environmental Protection Agency, (1996), *Producentansvar- det första steget*.

Swedish Environmental Protection Agency, Factsheet, *Good Reasons for Producer Responsibility*.

Swedish Ministry of the Environment, (1994), *Ordinance on Producer Responsibility for Packaging*, SFS 1994: 1236.

NFR (The Swedish Packaging Council), *Note on Producer Responsibility for Waste Now Introduced in Sweden*.

REPAREGISTRET AB, (1996), *Information Pack for Companies on Producer Responsibility and Recycling and the REPA scheme*.

Svenska Kommunförbundet (Swedish Association of Local Authorities), (1995), *Conditions for Sustainable Development*.

3. Case Study 3

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

3.1 Summary Information on EA

Case Study 3:

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

p The Environmental Issue	1995 & 1996 Version: Climate change/global warming – focus on CO ₂ emissions
p 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 for 2015) 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 offered absolute targets) No targets for companies
p Start Date	1995, updated 1996
p Timescale	Continue until at least 2005, and until 2015 for electricity
p 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
p 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
p Type of EA	EA – target based (total & specific energy savings & CO ₂ reduction targets). Mainly process based
p Sanctions/ Enforcement Mechanism	None in the 1995 or 1996 EA Only public pressure
p Other provisions/principles	Many potential future issues as part of EA revision process, e.g. some discussion of bringing in carbon/energy tax and waste heat ordinance for free-riders

* The case study was revised by Kai Schlegelmilch (Wuppertal Institute for Climate, Environment and Energy, Wuppertal).

p	Legal Basis	None – Gentlemen's agreement, 'morally' binding
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3.1.1 Sector Structure and Coverage

The 1996 EA covers 19 associations from a broad range of industry sectors, as listed in Table 3.1. Together they represent around 80 % of Industrial Energy Consumption and over 99% of public electricity production. Though some statistical and methodological problems are yet unsolved (regarding the targets, sector definition, and numbers counted twice), the 1996 EA contains four associations more than the 1995 EA and more associations are expected to join in the future. Not all signatories noted the level of representation or coverage of their sector in the EA declaration. Where available, data are noted in Table 3.1. Ideally the EA should note the number of companies, the share of the market, and the number of employees. This would allow the non-expert to interpret the importance of the EA more easily. Even now, not all sectors of the economy are covered; important sectors like those of investment and consumption goods as well as food are missing.

3.1.2 Institutional and Sectoral Aspects

As shown in Table 3.1, the EA signatories include some of the most important industries in Germany, representing thousands of companies and over a million employees.

Many of these associations have representatives in both the old states and the new, eastern states where there has been

significant plant closure, refurbishment and new plant creation. This activity has led to significant reductions in energy consumption, energy efficiency improvements and CO₂ reductions. These changes clearly are not the result of explicit initiatives to reduce CO₂; they are due to attempts to meet national and association targets and are better seen as a result of German unification (sometimes called ‘wall-fall’ gains). This has important implications for target setting and for assessing whether these are easy to meet or not (see Section 3.7).

In addition, many of the large companies have subsidiaries in other sectors and are active in mergers and acquisitions. This can be important for issues of sector classification, the setting of targets and the appraisal of performance against targets, especially over longer stretches of time.

Finally, a further institutional issue in Germany is that of local and regional monopolies in energy supply. Each monopoly can generate and distribute energy. This can lead to inefficiencies where supply exceeds demand and captive markets mean that there is less incentive to increase generation efficiency. The EU is, however, committed to the development of the internal energy market and this is expected to increase competition and, therefore, to improve the efficiency of energy production and distribution, with possible energy and CO₂ gains.

Table 3.1: EA Association Coverage – 1996 Revised and Updated EA

	Sector and Association	Employees	Market Coverage / Share
1	Cement: Verein Deutscher Zementwerke e.V. VDZ (part of Bundesverband Steine & Erden)		
2	Brickworks: Bundesverband der Deutschen Ziegelindustrie e.V. (BDZ)	14,000	300 heavy clay works
3	Limestone: (part of BDZ) Bundesverband der Deutschen Kalkindustrie e.V.	5,500	
4	Refractory/fireproofing industry, (part of BDZ)	9,000	80
5	Ceramic tiles and panels: (part of BDZ) Industrieverband Keramische Fliesen + Platten		Ass: 15 ; Ind: 30 80% of turnover
6	Glass & Mineral Fibre: Bundesverband Glasindustrie und Mineralfaserindustrie e.V.		
7	Potassium: Kaliverein		Ass: 99% of producers
8	Paper & Pulp Paper: Verband Deutscher Papierfabriken e.V.		
9	Chemical Industry: Verband der Chemischen Industrie (VCI)	530,000	Ind: 1518 chemical companies; Ass: 95% of companies, >99% of turnover; and over 200-300 equipment suppliers
10	Non-ferrous Metals: Wirtschaftsvereinigung Metalle		
11	Steel: Wirtschaftsvereinigung Stahl	136,000	
12	Sugar: Verein der Zuckerindustrie		
13	Textiles: Gesamtverband der Textilindustrie		
14	Oil refining industry: Mineralölwirtschaftsverband (MWV)		
15	Gas and Water: Bundesverband der Deutschen Gas – und Wasserwirtschaft e.V. (BGW)		
16	Electricity generation: Vereinigung Deutscher Elektrizitätswerke – VDEW – e.V.	200,000	Ass. 750 Ind: 1000 99% of public electricity generation, 86% of total elec. use
17	Industrial Energy Consumers & Auto-producers: Verband der Industriellen Energie- u. Kraftwirtschaft e.V. (VIK*)		almost 14% of total electricity production
18	Association of municipal enterprises: Verband kommunaler Unternehmen e.V. (VKU)	168,000	Ass.: 900; 28% of public power supply (gas & district heating)
19	Bundesverband der Deutschen Industrie e.V. (includes 1-14 above)	n/a	n/a

Source: EA (1996), *Updated and Extended Declaration by German Industry and Trade on Global Warming Prevention*: BDI, Cologne, Germany

* The VIK has acquired a number of new members recently, including the German Industry and Trade Congress, the Association of Technical Inspectors and Organisations, and the Federal States Organisations.

3.2 Background and Context

3.2.1 The Country Context

3.2.1.1 *History of Environmental Regulations, Environmental Policy Approach*

Environmental regulations are all more or less in place in Germany and recent interest has been moving towards the use of alternative instruments, such as environmental taxes and charges, the EMAS scheme and voluntary measures, such as labelling of specific environmental agreements (or, as some prefer to call them, negotiated agreements). Furthermore, the development of regulation and instruments to address environmental concerns has taken place within the context of regular discussions between government bodies (national, regional or local) and industry.

3.2.1.2 *History of Environmental Agreements in Germany*

The interest in EAs started in Germany in the 1970s. Around 60 EAs have been signed to date (including the EA being examined here). Nearly all (around 90%) of previous German EAs were product-focused beginning with the EA on CFCs and dangerous substances, whose success was facilitated by the limited number of producers (only one in three) involved. The need for EAs in Germany should be seen in the context of a number of factors:

- while regulations are in place for most important environmental issues and there is general compliance, there is a need for EAs to encourage companies to go beyond regulatory standards;
- passing regulations for all products can become burdensome for industry; one cannot for example, deal with all of the 20,000 chemicals produced by German industry through regulation;
- there is a need for an instrument to encourage a greater sense of shared

responsibility between Government and Industry so as to maximise benefits and develop a self-sustaining, pro-active attitude towards the environment on the part of industry.

3.2.2 The Environmental Issue

The Climate Change EA responds to the threats of global warming, and is a key element in Germany's promise to meet its nation-wide CO₂ emissions reductions targets of 25% reduction (with respect to the level in 1990) by 2005 which was agreed in Berlin, and resulted from the Rio Declarations. It is especially important to Germany to meet its targets as it will be acting as an example to the rest of the industrialised world (German targets are the tightest), and also as a statement to the developing world that Germany is serious about carrying out its share of reductions and embracing the special responsibility that industrialised nations have with regard to the level of CO₂ in the atmosphere: current and short-term projected rises are attributable, mainly, to existing CO₂ emissions levels in the industrialised countries.

3.3 Negotiation of the EA

3.3.1 Parties Involved in the Negotiations

The idea of an environmental agreement to address the climate change problem was first discussed between the German government and industry sectors in 1990/91. The associations involved at this stage were the VDEW (electricity), the VIK (energy and power) and the VCI (chemicals). These associations represented the main energy suppliers and users, and so were the most important in addressing the climate change problem, and had the most to 'lose' if the discussed carbon/energy tax was to be introduced.

As it became clear that an agreement could in principle, be reached, other parties, including the BDI (the German industry association),

were brought in. Given the BDI's role of representing most sectors of German industry, it was, in 1995, given overall control of the development and negotiation of the EA. Fifteen associations were party to the agreement in 1995, and a further four joined in 1996.

During the negotiations towards the first version of the EA, the level of public participation was low; only the associations and the Ministries of the Environment and Economics were involved. Neither NGOs, Länder nor Municipalities had a role in the negotiation of the 1995 EA. The reason cited for this is that it was felt that involvement of additional bodies like these would slow down the negotiation process. At this stage, therefore, the only role these parties had was to comment on or criticise the EA when its contents were made public. In fact, the publication of the 1995 EA led to significant public criticism, especially by NGOs (both environmental campaign groups and research institutes). This contributed to the introduction of a number of positive changes (which are discussed in Section 3.5).

3.3.2 Reasons for Participation and Expected Benefits

From the company perspective, the main reasons for joining the EA were:

- signing the EA would ensure that the waste heat ordinance would not come into force;
- signing the EA would ensure that the carbon/energy tax would not be levied;
- individual associations tied their commitments to the above conditions and to special conditions which could increase their influence over government policy decisions.

From the government perspective, the main reasons were:

- to be able to offer a serious instrument demonstrating the commitment to meeting the national CO₂ targets;

- to find a mechanism that would not burden industry, which was already burdened by significant regulation, high energy costs and tax rates (especially given the special Unification tax).

The expected benefit was, therefore, that industry would reduce emissions of CO₂ and help to meet the national targets, while not being burdened by the costs of an inflexible approach to meeting these targets.

3.3.3 The Negotiation Process

3.3.3.1 Overview

While the discussions on EAs started around 1990, it was only with the growing expectations of the Rio Conference/UNCED, that the climate change issue assumed greater political significance and governments started to look seriously for solutions, particularly in the form of a carbon/energy tax and the use of Environmental Agreements. Industry associations discussed the EA alternative to the carbon/energy tax with the government. These discussions were initially very positive, but the momentum towards agreement was not sustained. However, with the impending Berlin Conference in 1994, the need for tabling some German proposal led to renewed interest, and ultimately offered sufficient incentive to reach an agreement (Table 3.2).

3.3.3.2 BDI Perspective

After prolonged contacts and discussions, the Government started the process of negotiating the EA with the BDI and external associations (such as the VDEW and VCI). This is in line with the German consensus approach to business regulation.

To meet the timetable, there was a need for the associations to get support from their members. The EA was attractive because it offered flexibility, whereas a tax would not.

Table 3.2: Chronology of Climate Change EA Negotiation

Date	Event
1990	First discussion of EA
1991	Initiative Paper written – basically a letter of intent
1992	Discussions slowed down, entrenched positions of government and associations
Dec. 1994	Impending Berlin Conference made progress on EA more important and discussions started to progress
	Government started raising the stakes by threatening to implement measures which would be costly to the association members:
	◇ The waste heat ordinance – Wärmenutzungsverordnung ◇ The carbon/energy tax
March 1995	Publication of EA
April 1995	Berlin Conference
1995	Significant criticism of EA as being little more than a 'no-regrets' option – on monitoring, targets, transparency, verification, and as being even less than business as usual; Discussions re-started on how to improve EA.
1996	New EA launched which addressed a number of the above points:
	◇ RWI hired as independent verifiers ◇ Monitoring approach documented and agreed ◇ Some associations set targets for 1990 ◇ Four more associations joined the agreement

The targets were agreed on the basis of reduction in specific energy use and specific CO₂ emissions and not for absolute emissions or energy consumption. It was felt that this was more realistic as companies would know more about the efficiency of production processes than about future market shares. The initial targets agreed reflected the anticipation of possible efficiency gains and other emission reductions measures by the member companies involved.

3.3.3.3 Ministry of Environment Perspective

The Ministry of the Environment was the first promoter of the CO₂ EA and had the first contact with the associations. The Ministry of Industry was then brought into the negotiations. The EA should be considered against the backdrop of 10 years of negotiation on the carbon/energy tax. In the Ministry there are two separate positions on

appropriate instruments for reducing CO₂ – the traditionalist (regulations, standards etc.) and the EA/collaborative/consensus positions. The latter position was accepted: it was decided that the EA would be the instrument to help meet the German CO₂ reduction targets set by Helmut Kohl (a 25% reduction from 1990 to 2005).

The aim of the EA was to create a process. The aim was not to have a 1995 statement that would be binding until the year 2005 (though it was not clear from the associations that they held the same view). The EA is a dynamic process, a continually developing tool.

This EA is a gentlemen's agreement, with no particular requirements at the company level. This sets it apart from the Dutch system, and indeed, from the current Commission recommendations/framework.

3.3.4 Future Issues in Negotiation

The Government regard this EA as a process and intend to offer regular revisions incorporating new elements to improve the EA and respond to public comment/criticism. To date, (see Sections 3.6 & 3.7) significant public criticism has been offered and several items of it have already been incorporated into the 1996 revision of the EA (see Table 3.3). However, even the new EA has been criticised (e.g. Wuppertal Institute 1997), and some of these criticisms are likely to be taken into account in future revisions.

The government already envisages that the EA will be revised again in 1997, with a special focus on joint implementation. It will also move more towards product-specific measures and targets (especially for the production of potentially CO₂-saving goods for other sectors, such as households) e.g. better insulation. The government also aims to include other associations in the agreement, for example, the Association of Household Appliances (ZVEI). They are also looking into the idea of including electricians' and boiler workers' associations and the communication and transport sectors in the agreement. Further ideas on how to improve the EA are given in Section 3.8.

3.3.5 Barriers to EAs

3.3.5.1 Ministry Perspective

The main barriers to the acceptability of the climate change EA were:

- some of the public tended to feel that, because it is not a parliamentary law, it is unlikely that the targets will be met;
- the EA goes against the 'polluter pays' principle, which would favour a carbon/energy tax;
- the EA is, a priori, much less of an incentive mechanism than carbon/energy taxes.

In addition to these barriers to the EA, both the 1995 EA and the 1996 EA have been subject to a series of criticisms by serious research institutes such as the ZEW, ifo,

Wuppertal institute and RWI. These are discussed in Section 3.6.

3.3.5.2 BDI Perspective

The main barrier to the commitment of the companies was the level of trust in the government: some associations feared that opting for an EA would result in having an EA *plus* a carbon/energy tax, rather than an EA *instead of* a carbon/energy tax. This lack of trust was overcome by those promoting the EA alternative.

3.4 Structure of EA and the Targets

3.4.1 Coverage of the EA and Free-Riders

The EA coverage of companies and turnover is presented in Table 3.3. In most cases, the associations represented a majority of the companies. This implies that there was little potential for industry-specific free-riders outside of the particular association. There remains potential for free-riders only from non-signatory sectors, and from companies within signatory associations who do not contribute their 'fair share' to reducing CO₂ emissions.

There are no explicit measures in the EA to address the problem of free-riders. The view is that public pressure and environmental awareness is such that most companies will take part in the agreement. To be seen not to embrace this initiative is regarded, by all the expert interviewees, as having negative effects on the company and this is a real incentive for companies to show that they are making CO₂ improvements.

A potential measure to address free-riders, is to implement the carbon/energy tax – but at a reduced or even zero-rated level for all signatories and at a higher level for non-signatories of the EA. If there is an EU-wide carbon/energy tax, then the German government will ensure that only the EA member companies are exempt. This should ensure that free-riders are not rewarded. It

also demonstrates a possible complementarity between EAs and environmental taxation. This combination of different environmental policy instruments should be explored further.

3.4.2 Targets

1995 EA: The initial target was *up to* a 20% reduction in specific CO₂ emissions by 2005, with reference to 1987. Only one association (the VCI) offered total targets (energy consumption and CO₂). Other associations offered only specific reduction targets.

The overall target was decided by the BDI plus the partner associations – the BDI cannot dictate to the member associations and the associations cannot dictate to their members. The choice of target reflects an understanding of the level of reductions possible. The target is not far from the government intentions to reduce absolute emissions by 25% by 2005.

1996 EA: The overall target is for a reduction of 20% of specific CO₂ emissions or specific energy consumption by 2005, with respect to emissions in 1990. This total target is an estimate of the achievable target for all the associations who are party to the agreement. There are no individual targets set for companies. Target levels were set by the Industry Associations, and there appears to have been little negotiation to tighten the targets or to agree some scheme for target-sharing. Table 3.4 gives the targets set by each of the associations under the 1996 EA. Twelve of the associations have since adopted total re-reduction targets in response to public criticism.

3.5 Implementation

3.5.1 Measures Taken to Improve Energy Efficiency and Reduce CO₂ Emissions

3.5.1.1 Overview

There is no explicit set of company level measures that are to be embraced. At the association level, the range of measures/initiatives to be taken vary considerably depending on the association and the sector. Sections 3.5.1.3 and 3.5.1.4 show the measures for two of the key sectors. For further measures see BDI (1996).

3.5.1.2 Government Perspective

Government says that it does not want a business-as-usual approach. It wants a ‘No-Regrets Plus’ approach. It is important that there is some actual additional effort as a *quid pro quo* for the benefits to industry from the delay in the introduction of the carbon/energy tax and the waste heat ordinance.

To ensure that the EA is taken seriously, the government emphasises that it is prepared to introduce significant regulatory measures if it believes that the EA is not being taken seriously by industry. Notably the government stated that it would not hesitate to ‘use regulatory and fiscal instruments’ if it emerged that the pledge given by the business community was complied with or amounted to little more than a ‘business-as-usual’ approach (BMU, 1995, in Rennings et al., 1996).

Examples of additional costs/initiatives include:

- dialogue and monitoring costs;
- information/awareness campaigns and specific information dissemination;
- bench-marking workshops;
- training of staff;
- additional, real additional cost measures (RES, JI)
- energy auditing (some associations to support addition auditing as a monitoring measure);
- setting up of a new institute in Leipzig. – ITOT (International Environment Technology Transfer Centre).

Table 3.3: Targets, Energy and CO₂ Emission Shares of the Associations

	Sector	Energy and electricity consumption (PJ) 1990		Past Improvements in energy use & CO ₂ emissions	Reference Energy & CO ₂ Emissions			Progress	Target
		Energy	Elec.		1987	1990	1995*		
1	Cement	109.5	13.2		[KJ/kgC] Old: 3130 New: 4250 Total: 3510	[KJ/kgC] Old: 2990 New: 3980 Total: 3200	[KJ/kgC] Old: 2950 New: 3180 Total: 3000	[KJ/kgC] All: 2800 20% sp. En. Red. Cf. '87	2005*
2	Bricks	24.3	2.2	Specific CO ₂ emissions in 1990, 25% of 1975 figure, energy consumption 40% lower		[kgCO ₂ /fired bricks] Old: 1935 New: 3100		[kgCO ₂ /kg fired bricks] All: 1645 Old: 15% red. Sp. CO ₂ , New: 70% red. Sp. CO ₂ ,	
3	Lime	31.1	2.6		[kgC/t lime] 167.5			[kgC/t lime] 142 Red. (sp.): 15-20% Red. (tot.): 20%	
4	Refractory industry	8.1	1.0	Old: specific CO ₂ emissions over last 20 years reduced by 15%	[kgCO ₂ /t] Old: 308 New: 1502 ('91)		[kgCO ₂ /t] Old: 283 ('95) New: 738 ('95)	Old: sp. CO ₂ red: 15% to 20%	
5	Ceramic tiles/panels			9% red in sp. Elec. Consumption1980: 2723 kWh/t ceramic t.	[kWh/t] 2477	[kWh/t] 2327	[kWh/t] ca. 2050 ('94)	Energy: 25% cf. '87 20% cf. '90 CO ₂ : 30% cf. '87 25% cf. '90	
6	Glass	67	14.9	1970-87: 47% sp. En. Con. 1970-87: 57% sp. CO ₂ con.			14% sp. En. (94, '87) 16% sp. CO ₂ (94, '87)	En (sp.) 22% ('87) CO ₂ (sp.) 25% ('87)	
7	Potash	34.4	10.9		[tCO ₂ /t crude salt] Old: 0.036 All: 0.094	[tCO ₂ /t crude salt] Old: 0.033 All: 0.09	1987-94: 14% sp. CO ₂ red. old Länder; 79% CO ₂ red. in new Länder (43% drop in capacity)	[tCO ₂ /t crude salt] Old: 0.029; (19% sp CO ₂ cf '87, 12% red. cf '90) 30% & 20% abs. red. All: 0.03 (68% sp CO ₂ cf '87, 66% red. cf '90) 83% & 78% abs. red.	

8	Paper & Pulp Paper	96.9	45.3	50% sp. en. red over last 25 years & 39% red. ('75-'92)				'87-95 10%-12% sp. en '87-95: 11%-13% sp. CO ₂	Tot. sp. CO ₂ - 22% ('90) Sp. en. -20% ('90)
9	Chemical Industry	460	198	Old: 1970-90: 37% sp. en. red. 1975-1992: 42% reduction in energy intensity	79 mt/a CO ₂	67.8 mt/a CO ₂	>45 mt/a CO ₂ ('94) 30TWh grid 45TWh tot.	-20% sp. en. + CO ₂ ('87-94)	Sp. en. -30% ('90) Tot: -30% ('90) Tot: -40% ('87)
10	Non-ferrous Metals	52	64.2	1960-'93 45% sp. en. red. (2.62 tCO ₂ /t crude steel to 1.44tCO ₂ /tc)	Sp. en. 2,230 kg CO ₂ /tWs: (100)	Sp. en. 2,149 kg CO ₂ /tWs: (96.3)		Sp. en. sav 22% '1990-2005	unclear
11	Steel	675	78.5		[kWh/100 kg beet] Old: 42 New: 142	[kWh/100kg] Old: 36	34 kWh/100 kg ('94)	29 kWh/100kg 27 kWh/100kg (2010)	
12	Sugar	36 ¹	3 ¹		613 GJ/net prod.	60 GJ/net prod.	Old: sp. en. -15.8% '87-94 sp. CO ₂ -17.7% '87-94	490 GJ/net prod. (2005) (est.) 502 GJ/net prod. (2000) (est.)	
13	Textiles	55.2 ¹	19.4 ¹			26 litres/m ²		-25% '90-2005 sp. heating oil consumption	
14	Petroleum industry			1970 40 lts/m ² of one/two family house		0.31 kgCO ₂ /kWh useful heat		All: 0.23 kgCO ₂ /kWh useful heat Old: -25% ('90) New: -60% ('90) All: -40% ('90)	
15	Gas & Water					289 mt CO ₂		270 mt CO ₂ 25% red. '87 to 2015 12% red. '90 to 2015	
16	Electricity generation				339 mt CO ₂				
17	Ind. Energy & Power Users								
18	Local Utilities								Sp. CO ₂ red. 25% ('90-2005) 34% absolute red.
19	BDI								

Source: EA (1996), Updated and Extended Declaration by German Industry and Trade on Global Warming Prevention, BDI, Cologne, Germany

* unless stated otherwise in the text

¹ including Eastern Germany

3.5.1.3 VDEW

As noted in the EA Document (BDI, 1996), about ten initiatives, aimed at ensuring that CO₂ emissions reach the targets set, are underway. A number of these are measures that would have been implemented even without the EA, though the scope and impact of some of them have been extended by the EA. The measures include:

- Demand side management measures (DSM), in particular the production of DSM guidelines by the VDEW for its 900 Members. While the large companies are aware of most of their saving potential (RWE, PreussenElektra etc.), many of the smaller ones are not. Together with RUE measures, DSM should lead to 15 mt CO₂ savings by 2005;
- 5mt of CO₂ target for efficiency improvements (RUE measures) up to 2005. There was already an associated reduction of 8mt in the 1993-96 period;
- New power stations – with the government setting efficiency levels at 45% for hard coal and 42% for brown coal, net of own use and including FGD use, which is expected to lead to around 40mt CO₂ savings;
- Increased focus on renewable energies – through R&D, domestic investment and use and imports (hydro-electricity from Sweden) – which is expected to lead to more than 10 mt CO₂ savings;
- Joint implementation - seven pilot projects have already been initiated (the Climate Secretariat in Geneva recently noted that, in all, 32 joint implementation projects have been undertaken. Seven of these are in Germany, all of them organised by the VDEW);
- Dissemination of information and thematic workshops;
- A quasi-measure/requirement that the government does not opt for early retirement of nuclear plant. This will offer a further 25mt CO₂.

Specific EA initiatives:

- Joint implementation – specific initiatives/projects and workshops/workgroups;
- More detailed monitoring and reporting;
- DSM – earlier and more comprehensive initiatives, especially the production of guidelines which are sent to all members;
- Some new RES;
- Awareness campaign –through the monthly VDEW publication, VDEW Contact, that is sent to all members;
- Workshops, e.g. on climate change/CO₂ – with around 100-200 participants;
- one- or two-yearly know-how transfer workshops between groups –involving around 10-20 practical experts with the results being sent to all members by the VDEW.

3.5.1.4 VCI Initiatives

Special initiatives include:

- Creation of useful case study material for use as examples to encourage other companies to adopt similar practice;
- Information campaigns, press releases, and dissemination of information on good practice and the importance of EAs – e.g. through their Monthly report, Chemie Report;
- Workshop and seminar organisation and presentations;
- Monitoring;
- EA discussed at last members' meeting.

3.5.2 Communication and Target-Sharing Between Partners

There is no explicit target-sharing between associations or between companies within associations. The associations have each set targets that they feel can be reasonably met, and there appears to have been no negotiation of targets between associations, which would imply some type of target-sharing. Each

association is bearing the cost of its own specific measures.

3.5.3 Monitoring and Reporting

3.5.3.1 Overview

In the 1995 agreement there was no provision for monitoring. But following public criticism, monitoring initiatives were included in the revised 1996 EA. The explicit monitoring requirement in the 1996 agreement entails detailed reporting of CO₂ emissions from the fossil-fuels used. This is to be carried out from calculations of fuel inputs to the power sector, based on data gathered from statistical offices, rather than by all 900 companies reporting their CO₂ emissions separately. This reporting is annual and on a calendar basis. Furthermore, it will be verified by an independent external expert from the RWI, a recognised institute.

Every company with more than 20 people has to report its energy use to the Statistisches Bundesamt and the Statistisches Landesamt – in addition to reporting basic economic data. The data collected and analysed at the Landesamt will be used as a basis for the calculation of CO₂ emissions (This differs from the Dutch model where there is a bottom-up questionnaire). This calculation will be carried out by the BDI, and verified by independent agents, the RWI. The monitoring report will be available to the public.

3.5.3.2 Limitations to Monitoring Possibilities

There are three main limitations to the possible monitoring of the CO₂ results:

1. In the new Bundesländer, the statistical approaches to defining sectors of industry is different from that used in the old Bundesländer;
2. Many companies in Germany are active in mergers and acquisitions and in selling off parts of their businesses;
3. The number of companies in the various sectors of the German economy can be very high.

3.5.3.3 Future Developments

While the current monitoring system is a big improvement on the complete lack of monitoring in the 1995 EA, there are still some concerns that it is not sufficiently transparent.

Consequently, in Cologne in November 1996, a workshop was held to try to formulate an improved monitoring system and it was decided to have a year by year report, which will help show whether the associations were in line with their targets and which could, in principle, lead to new targets and new initiatives.

3.6 Outcome

3.6.1 Progress Towards Meeting Targets

As the Climate Change EA was signed only in 1995 and 1996, and the first monitoring report will not be available until autumn 1997, there are currently few data available on the level of energy efficiency gains and CO₂ reductions for the EA signatories.

There are, however, data for part of the target period and for previous years. These can be used to determine whether it is likely that the targets will be reached, and indeed how tough the targets are (see next section). However, the data clearly offer no indication of the EA's effect on energy efficiency and CO₂ emissions. Improvements to date are given in Table 3.5 (Section 3.7).

3.6.2 Benefits

3.6.2.1 To Companies

- No CO₂/energy tax implemented, though there is a threat of implementation if EA targets are not met;
- No waste heat ordinance implemented but the threat remains;
- Investment in energy efficiency in line with investment cycle;
- Energy savings through greater awareness of possibility to make savings;

- Specific condition clauses incorporated into EA.

To date, no licensing benefits have accrued from participation in an EA.

3.6.2.2 To Government

The EA is regarded as being faster than the law making process and as increasing the level of dialogue between government and industry. It will probably develop its own momentum as a result of the clear economic benefits of implementing 'no-regrets' strategies: the development of new markets, and the potential value of an image of green corporate responsibility.

3.6.3 Spin-Offs

Apart from those listed above, there are likely to be the following additional benefits:

- The experience of this EA might encourage the adoption of a joint implementation approach in future EAs;
- The framework of regularly updated EAs might allow the incorporation of other GHGs in the future;
- This climate EA has aroused interest abroad and could, conceivably, lead to similar efforts being adopted.

The EA is not, however, expected to offer real encouragement to the uptake of EMAS; German companies have for many years been carrying out environmental audits and implementing environmental monitoring and management systems. Part of this reflects their existing requirement to submit information on SO₂, NO_x and dust/particulate emissions to the local municipality. Some also voluntarily submit CO₂ emissions data.

3.6.4 Criticisms

In addition to the barriers mentioned in Section 3, the EA, especially in its 1995 version, has come under severe criticism.

Key Criticisms of the 1995 EA Have Included:

- No monitoring required in EA;

- Targets set by the associations: government or outside parties have no real influence;
- Targets couched in terms of 'up to 20% reduction';
- Targets set by most (all but one) association refer only to specific energy use and CO₂ emissions, rather than total emissions;
- Target reference date is 1987, not 1995;
- No intermediate targets, only for 2005;
- No independent verification;
- No means to ensure that companies take significant action;
- Companies do not have to monitor their own CO₂ emissions;
- The German Institute of Economics states (DIW, 1995, in E. Jochem & W. Eichhammer, 1996) that the CO₂ emissions reduction target envisaged by industry would be expected to be met without additional measures;
- The Wuppertal institute and others questioned whether additional measures in many branches/association were really indicative of further improvements (Wuppertal Institute, 1996, in E. Jochem & W. Eichhammer, 1996);
- East, west and total targets are not always clear so that advances which are due to the unification of Germany are not always distinguishable (sometimes called 'wall-fall' profits);
- EAs of several associations are linked to conditions unlikely to be fulfilled by government (Wuppertal Institute, 1996).

Criticism of EAs in General:

- Lack of clarity about how intra-industrial structural change (E. Jochem & W. Eichhammer, 1996) will contribute to meeting the stated targets, and how much will simply reflect initiatives to improve energy efficiency; and, indeed, how many of the latter truly represent initiatives which go beyond a 'business-as-usual' situation (see later discussion in Section 3.7);

- Absence of real negotiated targets between government and industry and no provision for stakeholder participation until after targets have been set and published;
- The inclusion of condition clauses which may give the associations further influence over government environmental policy;
- The frequently low level of targets which may ensure that targets are reached but does not convince the public that real additional efforts will be made.

3.7 Assessment of Effectiveness

3.7.1 Environmental Assessment

3.7.1.1 *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 are variable in quality and coverage and this demonstrates the need for clearer reporting in the EA, including the 1996 declaration of several associations.

3.7.1.2 *The Targets*

As noted in Section 3.4, Table 3.3, the EA targets for associations are presented against a base year of either 1987 or 1990. Many of the associations are already some way towards the 2005 targets, and it is generally accepted by the parties that the targets will be reached. This tends to reflect:

- The progress made over the period 1987 to 1995, before the EA was signed, and
- The fact that, for most of the associations, the targets are easily achievable;

This can be seen in Table 3.4, which shows the improvements (in specific terms) over time. In the case of the glass, cement and ceramic associations, improvements in energy efficiency before the EA was signed, but within the target timescales, represent more than half of the total target over the whole time period for the EA.

The latter point (that of easily achievable goals) reflects the fact that the targets were often set with the express intention of being easily achievable (source: interview discussions) given the measures adopted by the companies. It also reflects the fact (mentioned above) that the real targets for the EAs are lower than a first appraisal would suggest, given past progress, and indeed are very much in line with historical trends in energy efficiency improvements and CO₂ reductions (see next subsection).

In addition, the qualitative assessment of environmental effectiveness, based on the structure of the agreement and interviews with key actors, suggests that the current EA formula is unlikely to produce actions extending much, if at all, beyond a 'no regrets' stage. The main results have been publications and workshops for information dissemination and transfer of know-how. It would, therefore, be generous to conclude that the EA will be a vital factor in meeting the targets.

However, the EA is a flexible on-going process, which allows for revisions and improvements. The environmental effectiveness of the agreement can be ensured by maintaining the momentum established and by creating incentives for greater emissions reductions. This could include establishing tighter and staged targets and company-specific commitments. Indeed, there are already some discussions on tightening the targets on the basis of existing progress.

3.7.1.3 *The Baseline*

In addition to comparing environmental performance against the reference points 1987, 1990 and, indeed, 1995, the environmental performance 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 (reflecting the continuing incentives to save energy and cut costs, technological improvements and new investments to replace capital stock).

Furthermore, the performance of the EA should be assessed against alternative policy scenarios e.g. a carbon/energy tax and the waste heat ordinance.

Business as Usual

Table 3.4 shows the improvements over time in energy efficiency and CO₂ emissions for specific sectors which are party to the EA and presents estimates of the annual energy efficiency improvements and the annual CO₂ emissions reductions where these are available.

It would be tempting to assume that, in the absence of the EA, this trend would continue into the future, as this would offer a useful baseline against which to judge the severity of the targets and the real effectiveness of the EA. However, there are strong arguments against following this assumption. It is not statistically tenable to maintain that past improvement rates are an indication of future improvement, both because of structural changes in the industry and because recent investments might signify that future efficiency gains will be smaller (or vice versa).

Alternative Policies

A further way to assess the effectiveness of the EA instrument is to compare it to other alternative instruments, such as the carbon/energy tax or the waste heat ordinance. A priori, it is clear that a carbon/energy tax would exert a greater incentive effect than the EA, as would the waste heat ordinance. The environmental effectiveness of these instruments is expected to be greater.

Regarding cost, the cost of the alternative carbon tax instrument would depend on how the tax is levied and on what is done with revenues from it. This is especially important as the appropriate use of the revenues or parallel reductions in other taxes (to ensure fiscal neutrality) could avoid potential competitive impacts and unwanted distribution effects. The cost of the other alternative instrument – the waste heat ordinance – is difficult to assess, though

industry associations maintain that it would impose real costs through the inflexibility of its requirements. In each of these cases, the alternative instrument is likely to have some real effect on CO₂, while the cost is not clear.

2.7.1.4 Environmental Effectiveness

Assessment Against the Baseline

It is too early to assess the environmental effectiveness of the EA. Monitoring data on progress since the agreement was signed are not yet available (the first monitoring report is expected Autumn 1997). A 1996 RWI/IFO study states that Germany is unlikely to meet its CO₂ emission reduction targets, even with the current revised EA. The results, the methods applied and the scenarios outlined have also met with criticism (Wuppertal Institute 1997). Although the EA does not cover all sectors affected by the obligations, and is, therefore, not responsible for the total target, it is clear that an increased effort under the EA would be very helpful in ensuring that Germany meets its commitments under the FCCC. The transport sector is the key to the achievement of these total targets and including transport associations would clearly strengthen the EA.

Compared With Other Environmental Policy Instruments

However, for the EA under its current (1996) formulation, the ‘additional efforts’ are not expected to be great so the effect of the instrument is not expected to be significant. The EA cannot, therefore, be regarded as an efficient instrument and, if it is not efficient, it can hardly be regarded as cost-effective even if the cost of implementing it may be relatively low. However, these are a priori comments: real assessment will have to be based on an examination of the results when regular monitoring data becomes available and on any further revisions of the EA.

3.7.2 Assessment Against Wider Impacts

Cost-Effectiveness

The EA represents some extra costs, notably for monitoring and reporting, communication

Table 3.4: Improvements Over Time in Energy Efficiency and CO₂ Reductions

	Sector	Period	Specific reduction over period		Average annual reduction		Target**
			CO ₂	energy	CO ₂	energy	
		years					by 2005
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	1987-1995	8%			1.0%	
	- new Länder	1987-1995	51%			8.5%	
	- old Länder	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
	Glass	1987-1994	16%	14%	2.5%	2.1%	En: 20% (A) '87
8	Paper & Pulp Paper	1970-1995		50%		2.7%	CO ₂ : 22% (A) '90
		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%	

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

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

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

and specific initiatives. It has not, however, been possible to obtain data on costs and, thus, a comparison with the costs the companies would have borne, 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 depend on their design and implementation

(for example, the mechanism for levying the tax, the use of revenues, flexibility in the implementation of the Ordinance etc.). It also appears that the costs incurred under the EA to date are only slightly higher than the expenditure on improving energy efficiency purely for cost-saving reasons.

3.8 The Future

3.8.1 The Ideal EA

As noted earlier in this case study, this EA should be seen as a process and will continue to develop in the light of progress to targets and public comment on it. The following box identifies a number of areas in which the EA could be improved.

In addition to issues of how to improve the EA, there are also measures in which the EA document produced by the associations could be further developed. New revisions could valuably include the following information:

- Current total and specific emissions of CO₂ (and ideally share of national total);
- Current total and specific use of energy (and ideally share of national total);
- Coverage – Number of companies making up the association;
- Coverage – (In numbers and percentage of the market they represent);
- Targets – both specific and total, in relation to the reference year and baseline (BAU);
- Interim targets noted and not just a target 10 years into the future;
- Specific initiatives planned for implementation.

3.8.2 Issues - EU-Wide and Further Afield

CEFIC has suggested an EU-wide EA. CEFIC's members are the chemical industry associations from 15 European states, including some from Eastern Europe. CEFIC put forward the initial EA proposal in 1990 and updated it in 1992.

Current recommendations include moving the CEFIC model to UNICE. This would provide a further EU umbrella model. It is much more important to have an EU wide agreement than a national one, given concerns over competition effects.

The ICCA (International Council of Chemicals Associations), which covers associations from the EU, USA, Japan, Canada, Australia, Taiwan and Korea, has also discussed (1 Nov. 1996) the possibility of developing an international EA. Similarly, the Clinton administration appears interested in EAs as a new instrument: the USA were positive about the model as demonstrated by Wittmeier.

The EA includes, also, a commitment that subsidiaries abroad will act in the the same way as parent domestic companies – e.g. Hoechst, which has a multitude of subsidiary companies abroad.

3.9 Conclusions

The following series of points summarises the key conclusions of the German Climate Change EA.

3.9.1 Outcomes

3.9.1.1 Environmental Effect

Currently the entire focus is on CO₂ emissions reduction whereas, initially, (1995 version) it was only specific reductions (more valuable to the companies). Now 12 of the 17 associations have complemented this target with absolute reductions (more valuable to the government target).

- It is expected that subsequent developments of the EA will include other greenhouse gases;
- It is too early to tell the environmental effect of the EA itself. It started in 1995 but the first monitoring will be in August 1997. However, one association has already, outside of monitoring and reporting requirements, presented data on improvements made.
- Nearly all associations have shown significant energy and CO₂ savings in the past 10 to 20 years, and have shown improvements since 1990, the new benchmark year for the EA.

Box 3.1: Possible Ideas for Improving the EA

- Include other instruments – i.e. EA + Joint implementation + taxes + R&D (bonus for EAs);
- Develop possible CO₂ reduction trading mechanism between associations and industry sectors;
- Implement waste heat ordinance and carbon/energy tax for non signatories/free-riders;
- Integrate other users/association e.g. the Association of Household Appliances (ZVEI), electricians and boiler workers' associations, and communication and transport organisations;
- Ensure that associations 'conditionality' clauses are dropped or that parallel targets are given if the conditions are not met;
- Improve transparency of monitoring;
- Tighten targets where possible/sensible and include intermediate targets;
- Include other global warming gases;
- Include product measures to complement this process EA;
- Include company-specific measures – targets, initiatives, monitoring and reporting (maybe for companies over a certain size and on a voluntary basis for smaller companies);
- Develop the international role of EA – by using foreign subsidiaries to help promote EAs abroad.

**3.9.1.2 Value of Negotiation/
Pro-Active Attitude**

- Both associations and government maintain that the negotiations have increased the level of trust and co-operation between the groups. There was real progress on improving the EA from the 1995 to the 1996 version –which increased number of associations, had more companies with total reduction targets to complement specific reduction targets, included explicit monitoring and reporting requirements, and defined targets in terms of 'reductions by 20%' rather than by 'up to 20%'.
- These improvements should, however, be considered in the context of the association requirements or *quid pro quo* for joining the EA. Most associations tie their targets to the condition that government does not introduce carbon/energy tax, waste heat ordinance, new financial measures, and other issues such as early retirement of nuclear power plants (VDEW) etc.
- It is important to see whether the associations continue to agree to developments of the EA – if as is expected, it is expanded to include 'joint implementation', tightening of targets, other greenhouse gases and, perhaps, permit trading.
- It is not clear what the other advantages of the EA are apart from those gained by industry who do not have to face the waste heat ordinance and the carbon/energy tax (though this tax is now very unlikely to be introduced given current antagonism to new taxes following the special unification tax – 'Solidaritätszuschlag').

3.9.1.3 *Cost-Effectiveness/Tailor-Made EA?*

- There are no company specific targets, only association-set totals. There are no methods in place to convince companies to do something; only the dissemination of information (monthly association journals, special publications etc.), special workshops and bench-marking exercises. Therefore, any improvement will be made on a no-regrets basis following an additional effort in the development and transfer of know-how. While costs are low, current incentives are such that benefits are also likely to be low.
- This EA is, perhaps, unusually specific in that the CO₂ problem is very different from waste water clean-up or recycling: it deals with energy efficiency and all large emitters are big purchasers of energy (except, of course, the large energy suppliers) and face continual incentives to increase energy efficiency, with subsequent CO₂ savings.

3.9.1.4 *Quicker, Smoother Achievement of Objectives?*

- To answer this question is more of a matter of theory, or a priori analysis, given that there are insufficient monitoring data to determine whether the EA has had a significant effect or is likely to have a significant effect.
- As it currently stands, a priori, some would argue that a carbon/energy tax scheme with staggered exemptions and linked to a fund supporting energy efficiency initiatives, would have been more effective. However, the EA tool is still being developed and progress is likely to be seen, if only as a result of the public continuing to harangue the government to improve it.

3.9.1.5 *Issues/Transferability*

- The effects are probably not insignificant for large companies, perhaps even internationally. Signing up certainly leads to some pressure to act, if only because it addresses the awareness barrier. The development of additional facets of the

agreement will be interesting as this could help launch the joint implementation concept, the tradable permit scheme, the incorporation of other GHGs and, indeed, perhaps the resurrection of the carbon/energy tax, if only as a penalty for not meeting targets or as an incentive for free-riders to join the agreement.

- The fact that four new associations have already joined the agreements shows that this type of agreement is not limited to a specific sector, (the non-industry sector is also involved in the issue of CO₂).
- The model is transferable, though there might be some scepticism as to whether a gentlemen's agreement, without enforcement, would work in all cultures.

3.9.2 *Approach – Good Practice*

3.9.2.1 *Prior Consultation*

- There was no prior consultation with NGOs.
- There was a long lead-in time before the agreement was signed, with the major associations involved throughout. Progress was only made when the government felt the pressure to have a product ready for the Berlin conference and industry needed an escape route from the impending waste heat ordinance.

3.9.2.2 *Binding (Sanctions/Free-Riders)*

- Currently, there are no sanctions, apart from public pressure, on free-riders, whether these are outside of the agreement or within the agreement but not doing anything.
- There is talk of the future use of the waste heat ordinance and perhaps also carbon/energy tax as a threat; the WWF has suggested that it be implemented retrogressively if targets are not met.

3.9.2.3 *Quantified Staged Objectives*

- There are no staged targets in the current EA, apart from VCI which has adopted a 2000 target.

- Targets are generally for 2005 relative to 1990 and/or 1987 and the electricity association (VDEW) target is for 2015. There are no interim targets, (barring that of the VCI) though there is reporting on targets which might lead to a gradual tightening of targets over time.
- Different associations have different targets, depending on their view of what is feasible.

3.9.2.4 Monitoring of Results

- In the 1995 agreement, there was no stipulation about monitoring;
- In the 1996 agreement, monitoring of results was agreed, with an association-specific reporting format and independent verification by the RWI. However, monitoring is not based on direct company surveys, but on data provided to the statistical offices as part of the requirement for companies with over 20 people to submit data on raw material use. It is, therefore, questionable whether all companies know their CO₂ emissions.

3.9.2.5 Publication of Agreements, Results

- Results are to be published yearly and made public.
- The agreements are public information (and they can be improved).

3.9.3 Other Key Issues

3.9.3.1 Relative Merits of EAs Compared to Other Instruments

- Very broad coverage of energy use/supply and CO₂ emissions (with a proposal mooted to bring in the transport sector).
- Cross-sector EA which is attracting more sectors.
- A process EA rather than a single short-term fixed tool. Allows further development and even the implementation of new ideas.
- It can, in principle, be used to complement other environment policy instruments such as taxes and regulation.

- Promises to be a unique, long-term, industry, and, potentially, economy-wide shared responsibility approach that can continue to develop and improve. The government states that it wants a yearly improvement of the instrument and, if industry agrees, then that is likely to happen.
- The EA does not, however, have the current incentive effects that a tax would have; though if there was a successful incorporation of the permit trading principle, then a dynamic incentive would be in place.

3.9.3.2 Sector Coverage – Ref. to Objective

The level of sector coverage is increasing and the aim is to continue to include other sectors.

3.9.3.3 Added Value – Ref. to BAU – Role and Ref. to Regulation

- This is very difficult to determine at this stage. It will certainly address the awareness barrier more effectively than regulation.
- How far CO₂ will be reduced from BAU is impossible to say. It depends really on the continued momentum and innovative ways of addressing awareness issues. However, there is a real potential here.

3.9.3.4 Relationship to Competition, Internal Market, Trade

- The EA was, in part, a response to the fear of unfair competition from foreign companies. Germany's energy prices are already amongst the highest in the EU even without carbon/energy taxes and a heat ordinance. On top of that, Germany has some of the highest corporate and wage taxes and a special unification tax. The EA was perceived to be necessary to avoid threats of greater competition.
- Now the EA could help German industry by helping it saving costs, though, of course, the CO₂ EA model could be used by other countries, who could also gain energy- and, therefore, cost-savings, and, thus, offset any competitive advantages.

3.10 Information Sources

Interviewees and Key Research Institutes Active in EAs

Interviewees	Other Key Contact Addresses
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ZEW: Zentrum für Europäische Wirtschaftsforschung (ZEW) Postfach 103443 D-68034 Mannheim, Germany Tel: +49 621 1235 210 Fax: +49 621 12 35 226	Dr Wittmeier Dr Gunter Thomas VCI: Verband der Chemischen Industrie e.V. Karlstrasse 21 D-60329 Frankfurt, Germany Tel: +49 69 25 56 14 63 Fax: + 49 69 25 56 24 42
Dr Joachim Hein Bundesverband der Deutschen Industrie (BDI) Gustav-Heinemann Ufer 84-88 D-53175 Köln, Germany Tel: +49 22 13 70 85 55 Fax: +49 22 13 70 86 40	Bundesministerium für Wirtschaft (BMWi) Referat III A 4 Villemombler Str. 76 D-53123 Bonn, Germany Tel: +49-228-615-0/-3449 Fax: +49-228-615-2675
RWI: Rheinisch-Westfälisches Institut für Wirtschaftsforschung Hohenzollernstr 1/3 D-45128 Essen, Germany Tel: +49 201 8149 – 0 Fax: +49 201 8149 – 200 http://www.rwi.essen.de	Dr Stephan Singer WWF – Germany Hedderichstrasse 110 D-60591 Frankfurt am Main, Germany Tel: +49 69 60 50 03 77 Fax: +49 69 61 72 21
Dipl Ing Manfred Hildebrand Dr Ing Thomas Hoffmann VDEW – Vereinigung der Deutscher Elektrizitätswerke e.V. Stresemannallee 23 D-60596 Frankfurt am Main, Germany Tel: Sw +49 69 63041 Fax: +49 69 6304 420	Kai Schlegelmilch Stefan Ramesohl Dr Kora Kristof Wuppertal Institut für Klima, Umwelt, Energie GmbH Döppersberg 19 D-42103 Wuppertal, Germany Tel: +49 202 2492 152/-183 Fax: +49 202 2492 108

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4. Case Study 4

The Netherlands: Declaration on the Implementation of Environmental Policy in the Chemical Industry*

4.1 Summary Information on EA

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

ρ The Environmental Issues	Climate Change, Acidification, Diffusion, Eutrophication, Waste Disposal, Disturbance, Parching, Wastage and Company-based environmental management
ρ 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) and 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).
ρ Start Date	1993
ρ Timescale	Targets set for 1994/1995, 2000 and 2010
ρ Number of Signatories	108 (all the parties listed below)
ρ Parties	– 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
ρ Type of EA	Implementation Agreement, under the Target Group Approach to meet the targets established in the NEPP
ρ 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 to non-signatories. Companies in the EA benefit from a simplified, more flexible licensing process.
ρ Other provisions/ principles	Each company in the EA produces a Company Environmental Plan (CEP) every four years, covering plans for an eight-year period, approved by the licensing authority, and used as the basis for the operating licence.
ρ Legal Basis	As signatories to the agreement, the individual companies are bound by private law.

4.2 Background and Context

4.2.1 The Country Context

During the 1980s, a sense of urgency developed in the Netherlands over the need to tackle environmental problems and to move towards sustainable development. At the same

* The case study was revised by Jan Willem Biekart (Netherlands Society, for Nature and Environment, Utrecht).

time, the need to adopt an integrated approach to environmental policy became apparent. This led the government to produce the National Environmental Policy Plan (NEPP) and the NEPP Plus (published in 1989 and 1990 respectively) which set out a strategy aimed at achieving sustainable development by the year 2010.

The NEPP and NEPP Plus contain over 200 quantified targets as part of an integrated environmental policy programme. The target-group approach was established to divide the responsibility for achieving these targets between different sectors of society. There are seven target groups: industry, agriculture, transport, consumers, the construction industry, the energy sector and refineries. The target group approach arose from the recognition of the need for co-operation between different sectors of society to meet the ambitious goals set in the NEPP. In particular, the government perceived that the necessary improvements in industrial environmental performance would be more easily reached by obtaining industry's commitment to solving problems and by using their expertise. The unilateral imposition of legislation by government was no longer recognised as the best option for all cases (Bastmeijer, 1996).

The integrated environmental agreements signed with individual industry sectors, such as the Chemical Industry Declaration, were developed through negotiations between government and industry, as a result of the target group approach.

The target group approach was a product of the consultative approach common in Dutch politics. The history of consultation between government, industry and NGOs has been favourable to the development of EAs in the Netherlands. The chemical industry declaration is one of a number of covenants adopted under the target group approach, as part of the integrated environmental policy introduced with the NEPP. Many different types of EA have been signed in the Netherlands, with over 100 known agreements

covering energy and environment, of which over 40 have been agreed since 1985. A code of conduct for establishing environmental covenants has been prepared by VROM (The Ministry of Housing, Spatial Planning and the Environment) and this sets out good practice in the drafting and preparation of EAs (Bastmeijer, 1994). EAs have also been used for a number of other policy areas.

A number of other developments in the field of environmental policy have occurred in the move towards an integrated environmental approach:

- the passing of a new Environmental Management Act (EMA), introducing modernised, integrated environmental provisions, to be implemented gradually from 1993;
- the introduction of greater flexibility in terms of environmental regulation for those companies which adopt an active approach to environmental improvements and management, for example through the simplification of the licensing procedure for companies producing Company Environmental Plans under the integrated environmental EAs (as discussed below) and with the use of company Environmental Management Systems.

4.2.2 The Environmental Issue

The declaration provides an integrated approach to improving the environmental performance of the sector. 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 included in an annex to the declaration, providing details of the basis for the targets set. The impacts and activities covered are:

- Climate change
- Acidification

- Diffusion (of environmentally hazardous substances to different environmental media, and radiation)
- Eutrophication
- Waste Disposal (including soil)
- Disturbance (Noise, Odour, External safety)
- Company-based environmental management.

Targets have been set for climate change, acidification, diffusion, eutrophication, waste disposal and disturbance, focusing on priority substances and waste streams. The targets do not cover all emissions for chemical plants.

4.2.3 The Sector

The declaration covers companies covered by SBI codes 29 and 30, with the exception of paint, lacquer, varnish and printing industries, pharmaceuticals companies and soap and cosmetics manufacturers. The groups covered by the agreement are listed in Table 4.1 below.

In 1995, 126 companies fell into these categories, of which 10 are large, multinational companies. 108 are members of VNCI, the Dutch Chemical Industry Association, which is a signatory to the declaration.

Table 4.1: Chemical Industry Groups Covered by the Declaration

SBI code	Industry Group
29.1	Fertiliser substances
29.2	Synthetic Resins
29.3	Colorant and paint
29.4	Other chemical base materials
29.8	Pesticides
29.9	Industries using other chemical products
30.0	Artificial and synthetic yarn and fibre company

The chemical industry in the Netherlands is active in improving its environmental performance. It was suggested by some actors that this may be due to the nature of the chemical industry, where much care has traditionally been taken over matters of health and safety, including environmental health and safety (de Hood, VROM). In the annual review of environmental management conducted by KPMG, the chemical industry was revealed as the leader in the Netherlands in terms of the development and application of Environmental Management Systems (EMSs). VNCI, the Dutch chemical industry association, consider that this interest in EMSs is in line with the companies' commitment to responsible care.

4.3 Negotiation of the EA

4.3.1 Motivation

Integrated environmental covenants arose as the result of consultation under the target group approach, as one policy measure for the achievement of the NEPP targets. The declaration from the base metals industry was the first such covenant to be signed, that of the chemical industry, the second. The concept has developed further since the signing of these two covenants.

The NEPP presented an implementation challenge for the Ministry of Housing, Spatial Planning and Environment (VROM). The government considered traditional command and control measures as insufficient for meeting the ambitious NEPP targets (see Section 4.2.1). The covenant evolved as a policy measure through discussions between industry and government.

For industry, the NEPP was a government plan and they were uncertain of their ability to meet the targets set out in it. Negotiations provided them with an opportunity to state their case. However, some companies were uneasy about the prospect of negotiating with government, because of a certain lack of trust due to past experience of regulation (Quik, VNCI).

The EA offers signatory companies greater flexibility in complying with environmental regulations. All companies whose CEP is approved by the licensing authorities benefit from greater flexibility in planning environmental investments and a simplified licensing procedure.

4.3.2 The Negotiation Process

The target group approach allowed for prior consultation between industry and government, which paved the way for the negotiation of a covenant. The staff of VNCI, the Dutch Chemical Industry Association, were given a mandate by their board to negotiate with VROM. The declaration from the base metals industry was signed while the negotiations with the chemical industry were still going on. The government were keen to use the base metals document as a model for the chemical industry agreement. However, the chemical industry insisted on the adaptation of the document and targets to meet its own situation.

The negotiations were discussed mainly by the VNCI working group on Health, Safety and Environment, with backup from technical experts at company level. The targets set under the declaration were circulated to technical experts in the VNCI member companies, as part of a survey on their technical feasibility (the survey did not ask whether the targets were economically feasible).

VNCI were keen to obtain support from a minimum of 80% of their members, through signature of the EA. This was necessary to ensure the credibility of the declaration. With less than 80% commitment, the threat of competition from free-riders would have acted as a deterrent to company participation and compliance. Over 100 VNCI members have signed the agreement or comply with the terms without being signatories. A few American companies were unable to sign, as their US head quarters would not authorise signature. However, these plants (Quik, VNCI, Roozenburg, DCMR) are managed so

as to comply with the requirements imposed on signatories to the declaration.

The declaration was recognised by Parliament. However, it remains an agreement between government and industry. Parliament did not have the authority to amend the declaration, although strong parliamentary opposition would have prevented the Minister from signing it and, effectively, forcing changes. Parliament is informed annually of progress under the covenant, and could push for legislation if the EA fails to reach its objectives.

The negotiations took two and a half years to complete and were carried on through a mixture of formal meetings and informal contacts. At times, it was necessary to involve representatives at the highest level, with the direct involvement of the Minister for the Environment on some occasions.

4.4 Structure of EA and the Targets

4.4.1 Signatories and Coverage

The declaration contains the targets to be met collectively by the sector, as established in the NEPP. The declaration is signed by the following parties:

- the Government: The Ministry of Housing, Spatial Planning and Environment (VROM), the Ministry of Economic Affairs and the Ministry of Transport, Public Works and Water Management;
- the associations representing the regulators: the Association of Provincial Authorities, the Union of Netherlands Municipalities and the Association of Water Control Boards;
- industry: the Association of Dutch Chemical Industries (VNCI) and the individual companies.

103 companies are signatories to the declaration, and a total of 114 companies are complying with the terms of the agreement (taking account of plant closures and

companies who have opted not to comply). A few American companies were unable to sign, as the head quarters in the US would not authorise signature (it is suggested that this is due to a lack of understanding of the Dutch way of working). However, these plants have managed to comply with the requirements imposed on signatories to the declaration. A few companies have not signed up because they are in the process of renewing their licences. There are a few free-riders, mainly SMEs. The declaration is estimated to cover 97% of total emissions from the Netherlands chemical industry.

4.4.2 Targets and Objectives

An overview of the areas covered in the declaration is provided in Section 4.2.2. As described in this section, the targets are drawn from the Integrated Environmental Target Plan for the Chemical Industry, based on the NEPP and NEPP plus, as well as other plans covering water and energy issues.

The targets set are quantified and staged, with targets set for certain substances for 1994/1995, 2000 and 2010. The targets are expressed as a percentage reduction over a baseline, usually set as 1985. The figures originally used to establish the baseline given in the declaration have been revised in the light of data provided on the baseline in the individual Company Environmental Plans (CEPs- described in Section 4.5), and aggregated to provide sector level figures. The targets, baseline year and timescale are given in Table 4.2. A number of non-quantified objectives are also included in the agreement.

Unlike the base metals agreement, the chemical industry declaration does not have firm targets for the year 2010. The targets in the declaration are intended as long-term guidelines towards which industry should strive, but which will be reviewed in 1998 in order to set targets which are feasible in the light of new technological developments. Otherwise, the targets in the IETP and, therefore, in the declaration, are the same as those established in the NEPP.

A more detailed review of the objectives and targets is given in Table 4.6, with the year 1992 as a more recent reference point.

4.4.2.1 Climate Change

Quantitative targets are set for ozone depleting substances as covered by the Montreal Protocol (CFCs, halons, 1,1,1-trichloroethane and carbon tetrachloride). For CFCs, for example, the targets are for phasing these out of production in the Netherlands by 1995 (although the date in the Montreal Protocol is 1997). However, this has already been addressed in the Netherlands by the existing CFC action programme. The targets are detailed in Table 4.2.

Targets for carbon dioxide emissions reductions are not included amongst the quantitative targets as these are already covered by an agreement signed by the VNCI with the Ministry of Economic Affairs covering energy-saving measures. This multi-year agreement (MYA) is taken into account in the implementation of the declaration, as energy-savings plans under the MYA are included in the CEPs produced by individual companies.

4.4.2.2 Acidification

Quantitative targets for SO, NO_x, NH₃ and VOCs (Hydrocarbons) are detailed in the declaration. These are listed in Table 4.2. Although it is not shown in the table, the targets for SO₂ and NO_x emissions are split into combustion emissions and process emissions.

4.4.2.3 Diffusion

Diffusion covers the dispersion of substances in air and water, and radiation. Quantitative targets are set for 1995, 2000 and 2010, based on the chemical industry's contribution to the overall targets in the NEPP. These targets are based on an estimation of an acceptable level of risk to be attained by 2000, and a negligible level of risk to be attained by 2010, for a number of priority substances which are hazardous to the environment. As an example,

Table 4.2: Targets, Baseline and Timescales for Quantitative Targets in the Dutch Chemical Industry Declaration

	Emissions in Base Year (tonnes)				Emissions Targets (expressed as % of emissions in the base year)		
	1985	1986	1989	Base year	1995	2000	2010
Climate							
1,1,1 - Trichloroethane			77.22	1989	...		
Tetrachloromethane		526.91		1986	...		
CFCs		3500.467		1986	...	0	
Halons		61.04		1986	...		
HCFKs							
Methane							
Acidification							
Sulphur dioxide	30161.65			1985	65*	23	10
Nitrogen oxide	48592.71		33300	1985	57*	40	10
Ammonium	4800.295			1985	...	50	17
Hydrocarbons	36018.64			1985	...	42	20
Dispersion to Atmosphere							
1,2-Dichloroethane	805.301			1985	...	10	10
Acrolein	3.2			1985	...	50	10
Acrylonitrile	466.733			1985	...	50	3
Benzene	696.753			1985	...	25	2.5
Chlorobenzenes	157.003			1985	50	30	10
Dichloromethane	2690.9			1985	...	20	10
Dioxenes	3.186			1985	30	30	10
Eth(yl)ene	4181.7			1985	...	50	10
Eth(yl)ene Oxide	176.632			1985	...	50	5
Phenol and Phenolates	28.76			1985	...	50	50
Formaldehyde	144.345			1985	...	50	10
PAKs	20.594			1985	...	20	1
Styreen	1602.349			1985	...	50	40
Tetrachloroeth(yl)ene	98.773			1985	50	10	1

	Emissions in Base Year tonnes			Base year	Emissions Targets (expressed as % of emissions in the base year)		
	1985	1986	1989		1995	2000	2010
Toluene	1381.257			1985	...	50	10
Trichloroeth(yl)ene	62.6			1985	50	50	50
Trichloromethane	163			1985	...	50	10
Vinyl Chloride	328.79			1985	...	10	10
Flourides	133.379			1985	...	5	1
Carbon Monoxide	20932.97			1985	...	50	10
Hydrogen Sulphide	468.712			1985	...	50	10
Cadmium	0.331			1985	30	30	20
Chromium (vi)	1.65			1985	50	50	10
Copper	1.326			1985	50	50	20
Mercury	1.076			1985	30	30	30
Lead	7.086			1985	30	30	30
Nickel	1.356			1985	50	50	20
Zinc	19.56			1985	50	50	20
Dust (fine)	9760.126			1985	...	25	5
Dispersion to water							
1,1,1 Trichloroethane	0.537			1985	50	30	1
1,2 Dichloroethane	30.703			1985	45	45	10
Acrylonitrile	34			1985	...	50	10
Benzene	56.712			1985	40	25	10
Chlorophenoles	0.301			1985	1	1	1
Dichloromethane	137.255			1985	...	50	50
Dioxines (in grams)	1.455			1985	70	50	10
Dithiocarbamates	2			1985	1	1	1
Drins	0.032			1985	10	1	1
Phenol and Phenolates	49.89			1985	...	50	10
Formaldehyde	230.8			1985	...	50	10
Phthalate esters	0.01			1985	...	50	10
Hexachlorobenzene	0.067			1985	15	15	10

	Emissions in Base Year tonnes				Emissions Targets (expressed as % of emissions in the base year)		
	1985	1986	1989	Base year	1995	2000	2010
Hexachlorobutadienes	0.001			1985	1	1	1
Organic tin compounds	6.83			1985	10	10	10
PAHs	2.463			1985	65	50	10
Styreen	11.135			1985	...	50	10
Tetrachloroeth(yl)ene	0.233			1985	15	15	2
Tetrachloromethane	2.092			1985	15	1	1
Toluene	71.404			1985	...	50	10
Trichlorobenzene	1.331			1985	50	50	10
Trichloroeth(yl)ene	2.078			1985	25	25	5
Trichloromethane	1.451			1985	40	40	10
Arsenic	6.413			1985	50	50	50
Cadmium	14.352			1985	10	10	10
Chromium	81.411			1985	15	15	15
Copper	20.397			1985	50	50	20
Mercury	0.877			1985	75	50	30
Lead	14.509			1985	35	35	30
Nickel	16.606			1985	50	50	20
Zinc	121.463			1985	35	35	20
Oil	305.698			1985	40	40	10
EOCL	100.517			1985	...	...	...
Eutrophication							
Nitrogen	8378.929			1985	50	30	25
Phosphate	14685.4			1985	50	25	10

Source: VNCI, 1996

* target set for 1994

Table 4.3: Guide Targets for Waste Treatment and Disposal

	1986 (thousand tonnes)	2000 (thousand tonnes)	2010 (thousand tonnes)
Volume of waste	4,004	5,155	6,019
Recycling/useful application	1,583 (40%)		
Prevention/ recycling/ useful application		4,584 (89%)	5,704 (89%)
Disposal	2,421 (60%)	571 (11%)	684 (11%)

Source: Declaration of intent on the implementation of environmental policy for the Chemical Industry, 1993

Table 4.4: Target for Proportion of Waste and Incineration by 2010

	1986	2000	2010
Total (thousand tonnes)	2,421	571	684
Dumping	97%	71%	76%
Incineration	3%	29%	24%

Source: Declaration of intent on the implementation of environmental policy for the Chemical Industry, 1993

reductions of between 50% and 90% over the base year are set for 2000 (see Table 4.2).

For radiation, the maximum permissible risk level (106 per year) must be achieved as quickly as possible. A more stringent target of a level of 108 must be met by 2010.

4.4.2.4 Eutrophication

Quantitative targets are set for reductions in emissions to water of Nitrogen and Phosphorous (Table 4.2).

4.4.2.5 Waste Disposal

The objectives set for waste disposal are to reduce the overall amount of waste generated by the chemical industry and to shift from dumping to incineration. The declaration

(IETP) sets a number of guiding targets shown in Table 4.3.

to Be Disposed of by Dumping

The declaration goes on to provide targets for the splitting of disposal into dumping and incineration which should be achieved for different waste streams by the years 2000 and 2010. The targets can be summarised into the total targets for dumping and incineration for industrial waste from the chemical sector and are shown in Table 4.4. Specific targets are also set for three priority waste streams: waste containing halogenated hydrocarbons, phosphoric acid gypsum and plastic waste. These are shown in Table 4.5.

Soil protection is also covered under the waste category. Direct emissions to the ground were to be phased out within five years of the start of the agreement. A number of other provisions are mentioned in the declaration, to be covered by special government orders which were to be issued in 1993, under the soil protection act, to cover the main activities which pose a threat to the soil. These would be followed by general rules. The IETP describes also the responsibilities for cleaning up contaminated sites, which is to be governed by a separate Commission on Soil Cleanup of Industrial Sites in Use.

4.4.2.6 Disturbance

This covers noise, odour, external safety and the storage of dangerous substances (Post-Sandoz), again setting objectives and targets as established by existing policy in these areas. However, these are generally met at a local level.

4.4.2.7 Company-Based Environmental Management Systems

The objective was for all chemical industry companies to have integrated environmental management systems by 1995. This was considered to be necessary for the production of the Company Environmental Plans (CEPs) which were to be completed by April 1995 (see Section 4.5).

The agreement includes a number of other provisions, including details on the production of Company Environmental Plans (see Section 4.5) and the role of the relevant authorities. It also states that the government and VNCI will seek harmonisation of environmental policies at an international level.

It is important to note that the agreement stipulates that companies must still apply the Best Available Control Technology and where this, or other existing policies, lead to environmental improvements beyond the requirements of the agreement, companies must not stop at the target set in the agreement.

4.5 Implementation

4.5.1 Sector-Level Co-ordination

A consultative group has been established to oversee the agreements and to monitor progress. The group contains representatives of the licensing authorities (Municipalities, Provinces and Water Boards), the Chemical Industry (represented by VNCI) and the three Ministries which are signatories to the declaration. It does not involve any NGOs or third parties. The consultative group reports annually on progress under the EA. Reports have been published for 1994 and 1995. They cover the consultative group's activities (including, for example, actions towards the

integration of environmental reporting studies which examine international competitiveness/harmonisation), and the aggregated results from the Company Environmental Plans (CEPs). The declaration and progress reports from the consultative group are available to the public.

4.5.2 Company-Level

The declaration complements existing environmental legislation, including the system of operating licences, which applies to chemical plants. In the case of non-compliance, or for companies not involved in the declaration, the existing licensing system applies.

Each company which is signatory to the declaration must produce a Company Environmental Plan (CEP). The CEP contains data on emissions in the baseline year, and measures to address the different environmental issues covered by the covenant. The CEP is submitted to the appropriate regulatory authorities.

The CEP is drawn up every four years and covers an eight year period. Once a CEP has been approved by the regulatory bodies, it is used as the basis of the application for an operations licence. This has the benefit for the company of simplifying and speeding up the licensing procedures. Companies must report annually on progress on the measures set out in the CEP. The results from the individual CEPs are aggregated to provide a measure of overall progress toward meeting the targets in the declaration. The monitoring conducted by the companies is verified by the regulators, who visit the sites on a regular basis, as they do under the licensing system.

The reports from the companies must be made available to the public and can be obtained by contacting the firms or from the industry association.

Companies are also encouraged to adopt environmental management systems which are seen as necessary for the preparation and required monitoring and reporting of the CEP. It is estimated that a CEP takes 12 to 14

months to prepare. VNCI have established a non-profit-making company called CHEMSERVE, which provides small companies, who do not have the technical staff available in-house, to produce a CEP, with access to free-lance experts (usually made redundant or on early-retirement from the chemical industry) to assist them in the production of the CEP at reasonable rates.

4.5.3 The Role of the Regulators

There are two types of regulatory authorities responsible for issuing operating licences for chemical plants- the water boards and the municipality or province. The province is responsible for large installations, whereas municipalities regulate smaller firms. In the past, separate licences were required for water issues and other environmental issues (air etc.). Of the 126 companies considered to be part of the chemical sector, 87 are regulated by provinces, and 39 by municipalities. There are 28 water boards, 18 of which are involved in the implementation of the EA (FO, 1995).

Under the covenant, these authorities must co-ordinate their licensing procedures. This is generally achieved by the province or municipality establishing contact with the appropriate water board. The water board area boundaries do not necessarily coincide with the province borders.

4.6 Outcome

Two annual reports on progress under the declaration have been published (1994 and 1995). Quantitative data are available on progress towards targets for the following areas: climate change, acidification, dispersion to air and water, eutrophication and waste. Table 4.6 presents progress for 1995 for these areas, excluding waste. Progress in the management of industrial waste for the chemical sector is only available for 1995. These data are presented in Table 4.5.

Progress has also been made in the areas covered by the agreement, including:

Soil Protection: Risk analyses have been carried out for 54 companies on 75 to 100% of their activities. 71 companies have undertaken soil protection measures.

Soil Remediation: Contaminated land inventories have been conducted for 104 companies. Further studies were conducted for 80 companies, revealing that clean-up was required for 64 companies. Clean-up is underway in these companies. 40 have achieved clean-up of up to 25%, 14 have achieved between 25 and 75% and the remaining ten companies have achieved remediation of between 75 and 100%.

Disruption: Noise and odour problems are dealt with on a local basis. The report for 1995 presents results for a section of the companies in the chemical sector. Concerning post-Sandoz, 85 of the 97 companies required to submit plans had done so by 1995. The report also describes the sector's compliance with the Seveso directive.

Integrated Environmental Management Systems: Of the 112 companies that submitted CEPs in 1995, 104 presented a statement of environmental policy and 101 companies have established an environmental management programme. These have been implemented to varying degrees across the companies.

From the data available, the consultative group has concluded that three substances are of particular concern as regards progress towards the 2000 targets. However, this does not imply that all other standards and objectives for 2000 will be met. These substances are NO_x, Vinyl Chloride and CO. The CO levels, however, cannot be tackled in practice without raising emissions of CO₂. The main obstacle to the achievement of the NO_x standard is the high cost of the equipment required to reduce emissions. The consultative committee is beginning to consider the feasibility of target-sharing measures to overcome this barrier.

The emissions reductions achieved so far have been reached relatively easily, although it is

not possible to say at present to what extent the progress to date has been the result of incremental changes and end of pipe solutions. There is now a debate on how to stimulate the redesign and innovation required to meet the much more demanding targets for the year 2010. These are likely to present a greater challenge to the chemical industry (van Namen, VNCI). The costs of the agreement to industry have not been quantified for the sector. It is likely that initial costs were faced by companies for the

establishment of EMSs and reporting systems, where required. VNCI estimates that a CEP requires at least one man year to prepare. However, for a number of companies, cost savings are likely to arise through increased efficiencies associated with the implementation of EMSs. Also, flexibility in planning investments for environmental improvements is likely to have benefits for companies, by allowing these investments to be better integrated into wider investment plans.

Table 4.5: Progress Towards the Targets Set for Waste Disposal

	1986 production (000 tonnes)	1995 production (000 tonnes)	Recycling/ re-use (prevention) in % in 1995 (and in 000 tonnes)	Target for prevention/ recycling/ re- use by 2000	Remainder for disposal (after re-use/ recovery) in 1995 (000 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 hydro- carbons	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 environment- al 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.

Source: FO (1996) Report from the Consultative Group for 1995

n.a.: no data available

The consultative group has also been involved in activities to integrate environmental reporting requirements under different plans and policies, including the CEP, to reduce the cost of administration to industry.

The costs to the regulators are unlikely to change significantly, although the role of the inspectors has altered, with more emphasis on working with industry and assessing companies' plans for investment in environmental improvements, to allow more flexibility.

Although the realisation of the targets was the primary benefit for the government, there have been a number of spin-offs identified by the parties interviewed, including:

- increased trust between the chemical industry and the regulators and policy makers, where relations had been more difficult in the past;
- greater communication and co-operation within the industry, with better ongoing information (rather than studies providing information on one point in time) on the situation in the industry.
- greater confidence in their work.

VROM indicate that the use of covenants has resulted in an entirely new approach to environmental policy-making and regulation.

4.7 Assessment of Effectiveness

4.7.1. Environmental Assessment

4.7.1.1 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 are used). However, emissions data are also available for 1992 and this provides a better reference point for assessing the effectiveness of the EA, which was adopted in 1993, as it

excludes changes in emissions which occurred before the EA.

The baseline for the targets set for waste management is 1986, and this provides the only reference point data. No data are available for 1992.

4.7.1.2 The Baseline

Business as Usual

Estimating a true baseline to take account of the likely situation in the absence of the EA is not possible because:

- the baseline should cover legislation on a wide range of environmental issues and pollutants.
- there is insufficient information on the environmental improvement which can be attributed directly to all the existing legislation.

However, using data on emissions from the base year used in the EA (1985, 1986 or 1989) and from 1992, it is possible to establish a rough trend that can be used as an indication of expected changes in emissions in the absence of the EA.

4.7.1.3 Environmental Improvement and Effectiveness

The assessment has been conducted against both the reference situation and the estimated baseline. Waste management is an exception, as data are only available for 1986 so the assessment of progress can only be made against this reference point.

The results of the assessment are shown in Table 4.6. The figures highlighted in bold indicate pollutants for which actual emissions for 1995 (under the EA) are below those achieved in 1992 and lower than those for the estimated baseline.

**Table 4.6: Environmental Assessment for the Dutch Chemical Industry Association
Against the 1992 Reference Point and the Baseline**

				Environmental Assessment	
Environmental Issue/Pollutant	Reference situation Emissions in 1992	Trend/Baseline (trend based on reductions in 1985-1992)	Current Situation in 1995 Emissions (tonnes)	Environmental Improvement (tonnes)	Environmental Effectiveness (tonnes)
Climate					
1,1,1 - Trichloroethane	28,85	0,00	1,58	-27,26	1,58
Tetrachloromethane	200,71	37,61	158,61	-42,11	121,00
CFCs	1779,16	918,51	60,65	-1718,51	-857,86
Halons	5,79	0,00	1,51	-4,28	1,51
Acidification					
Sulphur dioxide	14253,06	7435,10	10992,62	-3260,44	3557,53
Nitrogen oxide ^a	28003,15	19179,06	25754,17	-2248,98	6575,12
Ammonium	2534,54	1563,50	2617,55	83,01	1054,05
Hydrocarbons	20135,51	13328,45	15196,52	-4938,99	1868,07
Dispersion to Atmosphere					
1,2-Dichloroethane	246,92	7,62	123,86	-123,06	116,24
Acrolein	3,20	3,20	0,95	-2,25	-2,25
Acrylonitrile	80,04	0,00	70,10	-9,95	70,10
Benzene	204,94	0,00	143,61	-61,34	143,61
Chlorobenzenes	110,40	90,43	30,31	-80,09	-60,11
Dichloromethane	535,80	0,00	452,66	-83,15	452,66
Dioxins	2,08	1,60	1,74	-0,33	0,14
Eth(y)ene	1429,55	250,06	1393,10	-36,45	1143,04
Eth(y)ene Oxide	73,18	28,84	37,94	-35,24	9,10
Phenol and Phenolates	20,39	16,80	7,03	-13,36	-9,77
Formaldehyde ^a	63,60	28,99	14,40	-49,20	-14,59
PAKs	47,93	59,65	37,69	-10,24	-21,96
Styreen	755,73	392,89	577,84	-177,89	184,95
Tetrachloroeth(y)ene	2,07	0,00	0,45	-1,63	0,45
Toluene	625,73	301,93	457,33	-168,40	155,39
				Environmental Assessment	

Environmental Issue/Pollutant	Reference situation Emissions in 1992	Trend/Baseline (trend based on reductions in 1985-1992)	Current Situation in 1995 Emissions (tonnes)	Environmental Improvement (tonnes)	Environmental Effectiveness (tonnes)
Trichloroeth(y)ene	29,10	14,74	11,10	-18,00	-3,64
Trichloromethane	34,20	0,00	29,60	-4,60	29,60
Vinyl Chloride	82,29	0,00	75,07	-7,23	75,07
Fluorides	101,72	88,16	39,45	-62,27	-48,70
Carbon Monoxide	24873,16	26561,81	31814,74	6941,58	5252,92
Hydrogen Sulphide	245,51	149,85	196,53	-48,98	46,68
Cadmium	0,22	0,17	0,07	-0,15	-0,10
Chromium (vi)	1,52	1,47	0,18	-1,35	-1,29
Copper	1,27	1,24	0,76	-0,51	-0,49
Mercury	0,78	0,65	0,41	-0,37	-0,24
Lead	4,84	3,88	1,09	-3,75	-2,79
Nickel ^a	1,55	1,63	0,25	-1,30	-1,38
Zinc	5,39	0,00	4,78	-0,61	4,78
Dust (fine)	3429,78	716,77	2393,25	-1036,53	1676,47
Dispersion to water					
1,1,1 Trichloroethane	0,37	0,30	0,09	-0,28	-0,21
1,2 Dichloroethane	6,08	0,00	1,33	-4,74	1,33
Acrylonitrile	26,12	22,74	0,05	-26,07	-22,69
Benzene	23,72	9,58	0,51	-23,22	-9,08
Chlorophenols	0,11	0,03	0,00	-0,11	-0,03
Dichloromethane	10,16	0,00	1,73	-8,43	1,73
Dioxins (in grammes)	0,99	0,79	0,31	-0,67	-0,47
Dithiocarbamates	0,10	0,00	0,00	-0,10	0,00
Drins	0,00	0,00	0,00	0,00	0,00
Phenol and Phenolates	8,84	0,00	1,19	-7,65	1,19
Formaldehyde	81,80	17,94	38,67	-43,13	20,73
Phthalate esters	0,01	0,01	0,01	0,00	0,00
Hexachlorobenzene	0,00	0,00	0,00	0,00	0,00
Hexachlorobutadienes	0,00	0,00	0,00	0,00	0,00

				Environmental Assessment	
Environmental Issue/Pollutant	Reference situation Emissions in 1992	Trend/Baseline (trend based on reductions in 1985-1992)	Current Situation in 1995 Emissions (tonnes)	Environmental Improvement (tonnes)	Environmental Effectiveness (tonnes)
Organic tin compounds	0,08	0,00	0,03	-0,05	0,03
PAHs	2,71	2,81	0,03	-2,68	-2,78
Styreen	2,24	0,00	0,41	-1,83	0,41
Tetrachloroeth(yl)ene	0,23	0,23	0,08	-0,16	-0,16
Tetrachloromethane	0,38	0,00	0,18	-0,20	0,18
Toluene	26,88	7,80	0,73	-26,15	-7,07
Trichlorobenzene	0,21	0,00	0,00	-0,21	0,00
Trichloroeth(yl)ene	1,45	1,19	0,40	-1,06	-0,79
Trichloromethane	0,95	0,74	0,60	-0,35	-0,14
Arsenic	1,67	0,00	0,70	-0,97	0,70
Cadmium	1,26	0,00	0,48	-0,78	0,48
Chromium	8,08	0,00	5,07	-3,01	5,07
Copper	5,59	0,00	6,27	0,68	6,27
Mercury	0,34	0,11	0,20	-0,14	0,09
Lead	5,07	1,03	5,20	0,13	4,17
Nickel	8,03	4,36	4,95	-3,08	0,59
Zinc	41,09	6,64	22,38	-18,71	15,74
Oil	140,93	70,31	22,17	-118,76	-48,14
EOCL	22,02	0,00		-22,02	0,00
Eutrophication					
Nitrogen	4462,64	2784,24	2402,32	-2060,32	-381,92
Phosphate	4104,25	0,00	3024,71	-1079,54	3024,71

Source: Data taken from the Annual Environment Report of the Chemical Industry for 1995, VNCI 1996, and from the FO annual report for 1995, published by the Consultative Committee in 1996.

1 Based on reference situation – emissions in 1992

2 Estimate based on rate of emissions reduction between 1985 and 1992, for all pollutants except climate change pollutants, where estimate is based on improvements between 1989 and 1992 for 1,1,1-Trichloroethane, and 1986 and 1992 for tetrachloromethane, CFCs and Halons.

a For emissions to air of NO_x, Formaldehyde and Nickel, the emissions for the companies covered by the declaration do not correspond to the emissions from VNCI companies, as they are influenced by companies which are not members of VNCI. For these three substances, the emissions figures from VNCI have been adapted using the information on progress under the agreement from the consultative committee's annual report for 1995.

To summarise:

- There has been an environmental improvement (against the reference situation): The environmental assessment reveals that there have been reductions in emissions since 1992 for all except four pollutants: atmospheric emissions of carbon monoxide and ammonium, and emissions to water of copper and lead.
- Furthermore, environmental effectiveness can be claimed, since the assessment against the baseline suggests that the EA has resulted in emissions reductions, for 33 of the 61 pollutants covered, above the level which could be expected on the basis of past emissions reductions.

However, it is important to note that the baseline reflects the historic trend in emissions reductions. It does not seek to reflect the effects 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, Personal Communication).

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 efforts had been made between 1985 and 1992.

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

Assessment of improvements in waste management against the 1986 reference point, and of progress towards the targets set for 2000 for waste reduction and the adoption of incineration as opposed to dumping as the preferred disposal option, is given in Table 4.5 (in Section 4.6).

The data available for 1995 demonstrates the following:

- a reduction in waste production for all the waste streams covered by the agreement (of between 4% and 78%);
- progress towards meeting the targets set for waste prevention and re-use by the year 2000;
- an increase in the proportion of disposal by incineration, through a reduction in dumping;
- three of the four targets set for the switch from dumping to incineration for the year 2000 had almost been achieved or had been exceeded by 1995, and progress had been made on the incineration of plastic waste.

4.7.2 Assessment Against Wider Impacts

4.7.2.1 Cost-Effectiveness

The increased flexibility for companies under the EA allows planning of environmental improvements to fit in better with the companies' investment plans, thus 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) and reduces the costs for firms of obtaining an operating licence.

The EA includes the wider objective of increasing the use of environmental

management systems. This will lead to environmental improvements through changes in management practices and may 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 target-sharing between the companies in the EA, which would reduce the overall costs of reducing NO_x emissions.

4.7.2.2 Other Outcomes

The Chemical Industry Declaration was the second covenant to be signed under the Target Group approach adopted to implement the NEPP. It has provided valuable lessons for the actors involved, especially the government.

The EA, by promoting increased trust and co-operation between the parties, has allowed a greater exchange of information, so that government and the regulators are better informed of the situation in industry and of the potential for further environmental improvements. This information may be useful for the development of future policy measures.

The increased flexibility for companies allows planning of environmental improvements to fit in better with the company's investment plans and so reduces the costs of the investments to industry.

There has been no evidence of target-sharing between companies to date (although there has been some flexibility over improvements at different sites operated by the same company). However, the actors are looking into the feasibility of a tradable permits scheme for signatories on NO_x.

The Declaration is thought by industry representatives to have resulted mainly in incremental improvements to date, although there is no quantitative research available to back up this impression. There is an ongoing debate in the Netherlands on how best to bring about the large innovation/ re-design required to meet the more ambitious targets set out in the NEPP for the year 2010. However, the EA has demonstrated that the introduction of

greater flexibility between producers and regulation will provide for a more cost-effective response than under the conventional operation of the licensing system.

There is no evidence that the Declaration is damaging to competitiveness, although the consultative committee has commissioned a study to investigate the effects of environmental policy on the competitiveness of Dutch industry at the EU level. The existence of long-term targets and objectives and the good relationship between industry and the regulator, may even come to be seen as a (fair) competitive advantage for the Netherlands.

4.8 The Future

As the implementation of the declaration progresses, the main signatories are keen for the CEP to move away from the structure of the traditional licence application and become a strategic document for the company. Already the CEPs are becoming less cumbersome.

The consultative committee is establishing a system of integrated environmental reporting for companies under the declaration to reduce the administrative burden on companies, by adopting a format that can be used to report on progress on the CEP, and for reports required under a variety of other environmental initiatives in place in the Netherlands.

Mechanisms for target-sharing, as discussed above, will be considered. This may result in tradable permit schemes for NO_x and SO₂, depending on the results of feasibility studies and the reaction of the companies in the agreement.

- Initial meetings on the new round of negotiations (to start in May 1997) will begin early in 1997, for the second round of CEPs. These are likely to cover:
- increased co-operation and target-sharing between companies;
- efficiency of resource use;

- a more strategic approach for the second round of CEPs;
- the possibility of process re-design in the chemical sector, as more innovative approaches will be required to meet the targets for 2010.

4.9 Conclusions

The quantitative assessment suggests that the EA has contributed to bringing about emissions reductions for 33 of 61 priority pollutants, beyond those that could be expected (from historic trends) in its absence. Government and industry believe that these improvements are being achieved at less cost

to industry than would have occurred under conventional regulations. Improvements have also been achieved since 1986 in waste management, with progress towards the targets in the agreement. Improvements have also occurred during the life of the EA in other environmental areas. 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 redesign and innovation required to meet these more demanding targets.

4.10 Information Sources

Public Authorities	Industry Association
Drs M M de Hoog (I) Ministry of Housing Spatial Planning and the Environment	Mr Quik (I) Technical Director VNCI Netherlands Confederation of Chemical Industries
Mr Bakker (I) RIZA Ministry of Transport and Water Works	Mr van Namen (I) VNCI Netherlands Confederation of Chemical Industries
Mr Jan Roozenburg (I) DCMR Association of Provinces	Non Governmental Organisations
I = Interview, T = Telephone	Mr Jan Willem Biekart (I) Stichting Natuur en Milieu (SNM)

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5. Case Study 5

Portugal: Environmental Protocol between the Ministries of Environment & Industry and the Pulp Paper Industry 1988 to 1991/2

5.1 Summary Information on EA

Case Study 5:

Portugal: Contrato-Programa Entre as Secretarias de Estado do Ambiente e dos Recursos Naturais (SEARN) e da Industria (SEI) e o Sector da Pasta de Papel (CELPA)

ρ The Environmental Issue(s)	Environmental impact of Pulp Paper Sector - waste water quality - air emissions - waste, and energy reductions
ρ Target	Specific targets for - waste water quality ◇ TSS: for all mills: 44,300 kg/day ◇ BOD: for all mills: 55,863 kg/day - air emissions ◇ particulates 150 mg/Nm³ (normal cubic meter) ◇ H₂S: 10 mg/Nm³ ◇ SO₂: 500 mg/Nm³
ρ Start Date	1988
ρ Timescale	Initial Negotiation 1987/88 Signature 1988 (June) Official End-date (targets binding) 1991/92 Inspection 1991/92 Unofficial end-date 1995
ρ Number of Signatories	Government: - Ex- SEARN now DGA (Environment Ministry General Directorate of the Environment) - Ex- SEI now DGI (Industry Ministry General Directorate of Industry) Industry: - CELPA – Pulp Paper Association
ρ Parties	3
ρ Type of EA	Compliance with existing target standards
ρ Monitoring & Reporting	Monthly emissions data from each plant to DGA and DGI and annual report
ρ Complementing other Measures	Grants from PEDIP and PEDIP II Threat of fines for non-compliance
ρ Legal Basis	Legally binding

5.1.1 Sector Structure and Coverage

The agreement covers all four companies and the eight mills in the Portuguese pulp paper industry, thereby covering 100% of the sector. The four companies were

1. SOPORCEL – large
2. PORTUCEL – large
3. STORA – medium
4. CAIMA – small

5.1.2 Institutional and Sectoral Aspects

The Portuguese pulp paper sector was one of the sectors which had a significant environmental impact, primarily on water quality and on emissions to air. Given the impending EU legislation, this sector needed to make significant improvements in its environmental performance.

In addition, the pulp paper sector comprised large, medium and small companies, with the larger ones having significant economic power and international connections.

Given the need for environmental improvements and its economic strength and connections the pulp paper industry was regarded as a key candidate for an EA. The large companies could be the EA ‘champions’ within the sector and this would encourage the SMEs to follow suit. This, in turn, would give a useful message to the rest of the Portuguese economy; that reducing environmental impact is possible for SMEs. This message is important given that 90% of Portuguese companies are SMEs.

5.2 Background and Context

5.2.1 The Country Context

5.2.1.1 *History of Environmental Regulations, Environmental Policy Approach*

The environment was generally a low priority for Portugal before its accession to the European Union in 1986. Through the process of Portugal’s application to join the EU, the

environment started to gain in importance, mainly because of the requirements to translate EU Environment Directives and Regulations into national law.

At the company level, awareness of environmental impact, and the introduction of measures to address these and comply with legislation was low in the 1980s. In addition, many SMEs had insufficient in-house environmental expertise and economic muscle to allow them to meet the requirements of legislation in the short-term.

Consequently, the situation could be summarised as being one of general non-compliance with legislation. It was also clear that passing legislation would not be sufficient to ensure environmental compliance. New instruments were needed to complement the new legislation.

The government chose to complement legislation with financial support, through programmes such as PEDIP (now PEDIP II) and started to look for further complementary instruments. Against a background of the Southern Member States’ perception of the EA concept as ‘very nice, but not practical’, the government, together with the AIP (Portuguese Industrial Association), DGA and DGI, decided to experiment with its first EA – that of the pulp paper sector. The pulp paper EA was also intended to offer signals to the rest of industry and to try to turn theory into practice.

5.2.1.2 *History of EAs in Portugal*

The pulp paper EA, signed in 1988, was the first experience of an EA in Portugal. It was chosen by the government as an appropriate first EA because of the real environmental impact of the sector, the significant potential there was for improving environmental performance and because the sector had the economic strength, 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 signed EA subsequently, in 1991 and 1992.

In 1994, following what was considered to be the success of the pulp paper EA, the government passed the EA General Framework Agreement which formed the basis for a range of new agreements. However, in the first quarter of 1996, after the change of the government, the new minister decided to freeze all EAs. The reasons were

1. that there was already a national air law (but no water law) that had to be complied with; and
2. that most EAs were not showing the improvements hoped. The company response was that the legal requirements could not be met and that they needed EAs to reach the targets.

The history of the development of EAs is littered with difficulties.

1987/88: At the time of negotiating the EA, there was no law on water pollution caused by the pulp paper sector. Concern for the environment was being pushed by politicians and not by industry, and politicians had a strong view that industry was bad for the environment. Industry viewed this as an unhelpful preconception.

1990: The government announced in a TV broadcast that it did not need EAs (TV was, at the time, the main method of communicating these environmental policy issues to the public). Result: EAs were effectively blocked.

As the years passed, laws were passed integrating the whole range of environmental directives from the EU into national law. This led to an increasing gap between what the laws were demanding and what the companies (especially SMEs) were able to achieve. This prompted renewed pressure to negotiate new EAs.

Table 5.1: Chronological Development of Environmental Agreements

1987	Discussions on EA in pulp paper sector between DGA, DGI, AIP & CELPA
1988	EA on pulp paper signed (the first EA in Portugal)
1989	EA for leather signed (3 years), with the same philosophy as the pulp paper EA
1990	WWT law – Decreto Lei Glass packaging (1.5 years) to reduce energy consumption, help increase recycling and meet recycling targets. Cardboard packaging for liquids (drinks industry – TETRAPAK) (1.5 years) reduce waste, reduce energy etc. total of 4 EAs signed
1992	PORTARIA for water with standards to be met by 1995
1994	Global framework for EAs Further EAs signed (government body responsible shown): Metallurgy – DGI Chemicals – DGI Federation of oils/margarine/soaps – DGI Marble/granite – Institute of geology and minerals Pigs – ministry of agriculture Agriculture – ministry of agriculture DGA involved in all of the above
1996	Current freeze of EAs – but expected to be unfrozen Need to see results of other EAs before further EAs signed

In 1992, the new minister addressed the need for new initiatives by passing the 'PACTO AMBIENTAL' and by setting up two working groups, one for municipalities and one for industry. The problem does not really lie with large companies like pulp paper and cement, who can get environmental experts from abroad, but with SMEs which often have no recourse to outside expertise. These working groups discussed again the value of EAs and proposed a Framework for EAs, as a basis for giving money to industry.

In 1994, the general agreement/framework for EAs was signed in Portugal. While this was to increase industry's sensitivity to the need to reduce their environmental impact, in the first year following the signature, little investment and environmental improvement were seen. The government felt that the industry signatories were not meeting their responsibilities and concluded that it was necessary to make the EAs more demanding and to ensure that there are fewer possibilities of industry not meeting its obligations.

5.2.2 The Environmental Issue

The environmental impact of the pulp paper industry was regarded as offering significant room for improvement, particularly with regard to the impact on water quality and air emissions.

The sector was also important as a signal to other sectors – that the government was starting to take environmental impacts seriously and that it is possible for sectors to improve their performance over a short period of time.

5.3 Negotiation of the EA

5.3.1 Overview

5.3.1.1 Parties Involved in the Negotiations:

- From the Government side – DGA (originally DGQA) and DGI;
- From industry – initially the AIP and later CELPA; all four of the Portuguese pulp paper companies – Soporcel, Portucel, Stora and Caima.

5.3.1.2 The Barriers to Participating

Initially many company directors were sceptical of the benefits of EAs and, indeed, of government motives, especially in the light of the traditional government approach of regulation rather than negotiation.

5.3.1.3 Industries' Reasons and Incentives for Participating:

- EAs allowed a negotiated approach to meeting targets –and industry was less likely to be confronted with by sudden imposition of new environmental legislation;
- They offered the possibility of improving the relationship and trust between industry and the government;
- Investment in environmental measures was inevitable anyway and the EA route allowed industry to structure its approach and exchange ideas with other companies.

5.3.1.4 Expected Benefits:

- Water quality and air emissions to meet standards by 1991/92;
- Better understanding and co-operation;
- Financial support for investment.

5.3.2 Development/Negotiation of the EA

5.3.2.1 Industry Sector Coverage

- EA on pulp paper focused only on pulp paper and did not look at forestry or other paper;
- Its specific focus allowed closer identification of targets;
- All companies in sector were covered by the agreement.

5.3.2.2 *Negotiation Between Parties*

AIP helped in the creation of the EA in 1988. The pulp paper industry is an associate of the AIP. The AIP, together with the DGA and DGI, started discussions. CELPA was contacted following the agreement to negotiate the first EA.

The government chose the pulp paper sector because it has a significant environmental impact that could easily be reduced given the financial strength, size and international connections of the industry. It was also important from the point of view that Portugal is a large exporter of pulp paper.

The development of the EAs was not inspired by German or other EU experiences. They did not follow the structure of EAs in other countries. The Portuguese EA was a separate initiative which led to significant environmental improvements.

5.3.2.3 *The Timescale*

The official timescale for the EA for pulp paper was from 1988 to 1991, a three-year period to meet the standards set in the EA. In practice, and unofficially, the EA was extended up to 1995. Thereafter, companies were obliged to maintain emissions at or below the level reached at the end of the contract/agreement.

1987

First contact;

1988

Initial signature (preliminary environmental studies, monitoring, action plan, investments, and further monitoring and reporting);

1989-91

Regular discussions between industry, DGA and regional DGA.

Mill-by-mill approach to reach targets.

1991

Standards in EA become binding;

1992

Inspection to verify compliance started;

1995

Unofficial end of EA.

5.3.2.4 *The Negotiation Process*

The final EA was the result of a series of proposals and counter-proposals. DGQA (now DGA) and DGI initiated the agreement together with the associations, AIP and CELPA. The pulp paper sector was chosen as it was considered to be strong enough to cope with the requirements. The only mill to take it seriously from the beginning was SOPORCEL. Other companies were initially more hesitant. By 1991, when the EA came into force, only SOPORCEL met the standards required. Following inspection of the mills, three mills were found not to meet the EA standards and were fined. The mills went to court, saying that dubious methods were used, and two of the mills won their case.

After this difficult period, the Ministers concluded that it was not very useful to spend time negotiating with industry. Therefore, in 1992, there was an unilateral imposition of regulations. The Ministry of the Environment, Industry and Health together passed the 'PORTARIA' (Portaria n. 506/92). This was a regulation setting up detailed conditions regarding the water effluent of this industry.

CELPA put pressure on to negotiate. The PORTARIA gave mills until 1995 to meet standards. After the mills had won their court case and the new regulations were imposed, all of the mills made the required investments to meet the standards. In 1995, at the end of the EA, all of the mills had reached their environmental targets.

In September/October 1995, the Ministry of Industry and the Ministry of Environment announced that the PARCOM (Convention for the Prevention of Maritime Pollution from Land Based Sources – Paris Convention), which comes into force in the year 2000, was

to become applicable in 1999. The PORTARIA was then dropped on the understanding that industry would meet the tighter deadline. CELPA again started negotiations with the government on how to meet the 1999 requirements.

5.3.2.5 *The Alternative to the EA*

The alternative to the EA is the traditional approach of law/regulation, with potential fines and court cases. This, however, might have been more difficult to implement given the greater need for people to monitor and ensure compliance of companies. An alternative law did not always exist. At the time of the first EA, it was the EA that influenced the law rather than the other way round. This is no longer the case.

The PORTARIA on the impact of the pulp paper industry on water quality allowed targets to be met by 1995. Furthermore, another regulation exists for air, following the principles of the EU Large Combustion Plant Directive. This gave industries more time (end 1995) to meet the target.

5.4 Structure of EA and the Targets

5.4.1 Coverage

All of the pulp paper mills were included in the EA, so there was no issue of free-riders from outside the agreement. However, within the EA, only some of the mills made the required investments in the early years of the EA. During that time, the companies not investing were effectively free-riders. However, with the threat of sanctions, all the mills made the required investments (except one that closed). Consequently, by 1993 there was no longer an issue of free-riders.

PEDIP II offers incentives for environmental improvements. All companies, whether in EAs or not, can obtain finance if they meet the PEDIP conditions. EAs and PEDIP are therefore parallel but separate programmes. However, because PEDIP conditions include

environmental issues, there is some implicit indirect linkage between the two types of initiative.

5.4.2 Targets

The targets for improvements for the EA include:

1. Water Effluents – Biological Oxygen Demand (BOD), pH, Total suspended solids (TSS);
2. Water consumption;
3. Air emissions – particulates, Sulphur, SO₂;
4. Energy saving;
5. Raw materials use and product recovery;
6. Other issues include used oil, waste, PCBs, oil spills etc.

The EA standards set for air emissions were quite demanding (see Table 5.2a). However, for water (as a whole), it was less demanding (see Table 5.2b). Though the first stage of meeting the BOD requirements was fairly demanding, the aim was to induce secondary biological treatment.

Targets set within the EA and the PORTARIA have been superseded by the requirements of the PARCOM. This would require new investments to meet new requirements. However, some standards were higher in the EA – i.e. NO_x and TSS (in water). In the cases where the level of environmental standards is less than the maximum limit set by PARCOM, the mills may not reduce quality.

5.4.3 Other Objectives

The Portuguese Government wanted to use the pulp paper EA as a signal to other industry sectors and to small companies. The government view was that the pulp paper sector:

- was an economically strong sector and could afford to invest to meet the environmental objectives;
- was a coherent sector which facilitated monitoring and negotiation;

Table 5.2a: Targets: Performance Standards for the Pulp Paper Sector

TSS (kg/day)		BOD ₅ (kg/day)		Particulates* (mg/Nm ³)	H ₂ S* (mg/Nm ³)	SO ₂ * (mg/Nm ³)
1987	Target	1987	Target	Target	Target	Target
63070	44341	122796	55863	150	10	500

Source: DGA

*Targets for main boiler unit only; other targets for other auxiliary boiler

TSS and BOD₅ targets are aggregates for all mills

Nm³ = normal cubic meter

**Table 5.2b:
Targets for Waste Water Quality**

	TSS (kg/ton)	BOD ₅ (kg/ton)
Bleached paste (Kraft)	10	9
Sector integrated paper (Kraft Liner)	4	6
Raw pulp (Kraft)	2.5	5
Bleached pulp (using SO ₂)	12.5	4.5

Source: Contrato Programa (1988)

Measures on average daily concentrations based on 24-hour monitoring

useful as a successful case, which would encourage other sectors to follow.

5.4.4 Assessment of the Targets

The standards achieved are significantly better than the ‘business as usual’ scenario, and do represent real investment beyond a ‘no regrets’ strategy, particularly because a plausible alternative scenario would have been the continued non-compliance with the laws. The targets eventually became part of national law for the sector and in two cases are tighter than the new EU legislation which is based on the PARCOM.

5.5 Implementation

5.5.1 Responsibilities for Parties

Meeting the target was the company’s responsibility. While CELPA was a key player in the negotiation of the EA with DGA, DGI and AIP, and therefore had the responsibility of encouraging action, all the explicit measures (excluding awareness issues) to reduce emissions were the responsibility of the company. This included monitoring, investments and progress reports. DGA had responsibility for the inspection of water effluents, while the Institute of Meteorology was responsible for the inspection of air emissions.

5.5.2 Measures

- contained some companies which had international contacts and could, therefore, have access to environmental expertise from abroad;
- had both large, medium and small companies so that the large company SOPORCEL could be used as the EA ‘champion’, which would encourage the smaller companies to follow, and this, in turn, would be a useful signal to SMEs in other sectors;
- had significant environmental impact and significant potential to improve its performance and would, therefore, be

Each mill was required to meet the targets. The route that they took was their own decision, with (in contrast to the new EAs) no need to produce a year by year environmental improvement plan for the government demonstrating how the targets were to be met. There was, however, a plan on the estimated expenditure required to meet the targets.

The measures taken by different mills to meet the same standards were not the same. STORA did not need to install secondary treatment equipment to meet the standards, while PORTUCEL did. This installation took longer than expected and PORTUCEL did not initially meet the standards. This partly reflects the fact that PORTUCEL is a state-owned company, and so it takes longer to push decisions through.

5.5.3 Monitoring, Reporting and Progress on Targets

5.5.3.1 Monitoring and Reporting

Each mill had to provide DGA and DGI with monthly environmental data and a yearly report. In addition, when the EA came into force in 1991, government inspectors had the right to enter company premises whenever they wanted. Two to three inspections of the SOPORCEL mill, were carried out, with special attention paid to water quality, in the first year. Air was more difficult given the lack of appropriated equipment and expertise. The responsibility for monitoring was therefore split between the DGA (water) and the Meteorological Department (air). DGI did not carry out investigations.

5.5.3.2 Target Revision

The targets were not revised within the period of the EA, though the target date was allowed to slip from 1991 to 1995.

5.5.3.3 Stages

In this EA, unlike the new EAs, there was no staging of the targets that had to be reached. There was a single set of targets that had to be complied with, by each mill (three years following signature, or by the second half of

1991). As only two of the eight mills met the standards at this time, the timescale for meeting the standards was extended until 1995 through the publication of parallel pieces of legislation (regulations for water and air) detailing the standards that would be binding for the pulp paper sector from 1995 on.

5.5.4 Incentives for Participation and Free-Riders

5.5.4.1 Level of Participation and Free-Riders

All four companies – SOPORCEL, PORTUCEL, STORA, and CAIMA – agreed to take part in the EA, given the perceived benefits. There was, therefore, no issue of companies acting as free-riders by not signing the agreement. The only possibility of free-riding was if signatories did not comply with the standards.

This was the case during the period 1988 to 1992 when only some of the mills made the necessary investments to meet the standards.

5.5.4.2 Penalties for Non-Compliance of Signatories

Companies that did not comply with the standards faced fines/penalties. Indeed, as some of the companies did not meet the targets in 1991, they were taken to court and fined though two of the three companies then took the government to court and won. This was followed, however, by real investments by those mills which were still below the standards. This was an indication that they realised that they would face serious sanctions if improvements were not made.

5.5.4.3 Level of Public Participation

There was no involvement of NGOs or consumer/public representatives. However, the government did use television to discuss the EA – sometimes positively and sometimes negatively. Some of the companies noticed that, after the positive press coverage (which included an explanation of what was being attempted), the number of complaints dropped considerably.

5.6 Outcome

The overall view of most parties to the EA was that the pulp paper EA was a success overall, despite the delay in meeting the targets.

5.6.1 Progress Reported Towards Meeting the Targets

Of the four companies (eight mills), only SOPORCEL had met the standards by the 1991 deadline. One mill closed in 1992/93, because, mainly, of a lack of economic viability and available markets though it was also clear that the mill could not meet the

environmental standards required. The closure gave rise to a large number of complaints from the public.

By 1993, nearly all mills had met all the standards and, in many cases, far surpassed them. Mill by mill data for each of the pollutants exist, as required by the EA. Seven of the eight mills showed real environmental improvements over the period 1988 to 1993 and further improvements by 1995. The greatest improvements were on water and on air emissions. Improvements in the area of waste were more modest.

Table 5.3a: Pulp Paper Environmental Performance — Water Quality (1987 & 1993)

Total Suspended Solids (TSS)			Biological Oxygen Demand (BOD ₅)			Chemical Oxygen Demand (COD)		
kg/day 1987	kg/day 1993	% reduction	kg/day 1987	kg/day 1993	% reduction	kg/day 1987	kg/day 1993	% reduction
63 070	103 33	84%	122 796	37 075	70%	467 543	106 092	77%

Source: DGA

In addition for the validity period (1991 cf. 1988), the following reductions had been achieved: TSS 58%; BOD₅ 72%; COD 52%; AOX 88%.

Table 5.3b: Pulp Paper Environmental Performance — Air Emissions (1987 & 1993)

S			Particulates			SO ₂	H ₂ S
t/yr 1987	t/yr 1993	% reduction	t/yr 1987	t/yr 1993	% reduction	t/yr 1993	t/yr 1993
This was a regulation setting up detailed conditions regarding the water effluent of this industry.							
17 826	4 082	77%	23 291	4 291	82%	4 636	1 875

Source: DGA

Specific values for S range from 0.1 to 6.4 kg/t pulp paper – across different mills

Specific values for H₂S range from 0.03 to 10.5 kg/t pulp paper – across different mills

Specific values for Particulates range from 0.5 to 11.1 kg/t pulp paper – across different mills

Table 5.4a Performance in 1993 versus the Standards Required
Performance of pulp paper sector as a whole

Total Suspended Solid (TSS)					Biological Oxygen Demand (BOD ₅)				
kg/day		% reduction	Target	Perf. vs. target	kg/day		% reduction	Target	Perf. vs. target
1987	1993				1987	1993			
63 070	10 333	84%	44 341	429%	122 796	37 075	70%	55 863	151%

Source: DGA

Note: TSS - all mills met targets in 1993

BOD₅ - one mill was far from standards in 1991, another just over

Table 5.4b: Performance in 1993 versus Standards Required
Performance of pulp paper sector as a whole

Particulates			H ₂ S			SO ₂		
mg/Nm ³		Perf. vs. target	mg/Nm ³		Perf. vs. target	mg/Nm ³		Perf. vs. target
1993	Target	% red'n	1993	Target	% red'n	1993	Target	% red'n
42	150	357%	3.2	10	313%	84	500	595%

Source: DGA

Note: Targets for main boilers, and performance averages for all mills.

red'n = reduction

Table 5.5: Investment in Environmental Measures (in PTE)

Air	Water	Material recuperation/minimisation	Target in plan	Realised (1992)	Realised (1995)
(1)	(2)	(3)	(=1+2+3)		
6,117,150,000	17,139,700,000	17,836,880,000	41,093,731,000	22,757,738,000 (55% of target)	34,000,000,000 (83% of target)

Source: DGA

Note: PTE - Portuguese Escudos

Accelerated progress to existing targets. The EA is now over. Seven of the eight mills met the standards by 1995. The other mill closed on economic grounds. There was no evidence of accelerated progress towards the targets although it should perhaps be noted that two mills were in effect EA 'champions' and, with their new investment programme and international support, were able to meet the target more quickly than the others.

5.6.2 Information on Costs of the EA

5.6.2.1 Companies

To meet the environmental targets set in the EA, companies had to invest on average an extra 2.5% over the normal investment sum. Exact figures for the industry as a whole are given in Table 5.5. These are environmental domain specific costs. The management of the process and the monitoring and reporting

requirements involved additional costs. These have not been quantified, and are likely to be far less significant than those noted in Table 5.5.

5.6.2.2 Government

Government costs have not been estimated but would include the time taken in negotiation, inspection, the training of local environmental experts and the provision of specific funds to support investment.

5.6.3 Benefits

The use of EAs can encourage industry, by focusing first on the large industries which can afford the costs, such as pulp paper, petrochemicals, cement. The AIP worried about the medium and small companies, though making something work with large companies can encourage SMEs. EAs give companies more time to meet the targets and, therefore, make it more likely that industry will meet them.

The main benefit is the opportunity EAs provide for increasing the level of discussion within and between industries, and between industry and government. In this context, ISO14001 is likely to be of increasing interest. There will probably be a clear benefit from complementing EAs with EMAS or ISO14001. These build on the monitoring, environmental improvement plan and reporting process already instigated by the EA, and would encourage further improvement.

5.6.3.1 Companies

Companies benefited from the pulp paper EA in the following ways:

- improved trust both between companies and between the sector and government: without EAs the industry would be encouraged to play cat-and-mouse with the government;
- companies understood that they could meet together and could agree on some points on

how to improve performance, sharing solutions;

- financial support for investment, at the time, through the PEDIP programme (to meet the air and effluent standards, SOPORCEL got around 300,000,000 PTE for investment programmes);
- internal/staff motivation improved;
- improved the eco-management, both internally and externally;
- enhanced public image and relations with neighbours; the government used the EA as a positive example of the new approach – and this led to greater understanding by the local population and fewer complaints;
- the EA allowed a timescale in which to meet the law and was, therefore, less restrictive than the law itself;
- allowed companies to meet standards following their own investment cycle and may have led to a minimal cost route of meeting the standards;
- an EA is not an imposition and companies therefore had a more positive attitude to meeting the standards;
- companies could develop their own motivation for environmental improvement;
- companies became more public orientated;
- improved the technical teams' ability to tackle environmental issues at the right time;
- has put the companies in the position to go for EMAS.

5.6.3.2 Government

The pulp paper EA was of benefit to the government in that it:

- helped ensure that the pulp paper sector complied with environmental legislation;
- helped increase understanding of the actual environmental impact of the sector, and its

- ability to improve performance, - effectively, demystifying the process;
 - increased understanding of real impact, thus helping the government in the drafting of legislation;
 - helped prioritise environmental funds allocation to ensure optimal environmental improvement;
 - provided an example and encouragement to other sectors;
 - encouraged a more positive approach to meeting environmental requirements, rather than the traditional approach of taxes, fines, jail, etc.;
 - helped develop greater confidence and trust between government and industry.
- Some experts regard EAs as appropriate only as a temporary measure, while new legislation is being implemented.

5.6.4 Other Impacts

Three of the big mills, which already had ISO9000, decided to go for EMAS. The view is that EMAS is a natural step to take after the EA (with its monitoring requirements etc.) However, EMAS is not yet very well understood in Portugal. It is a new idea, but its benefits are becoming apparent (e.g. in that EMAS could lead to a reduction in licensing).

Foreign competition was considered a real danger. If the system were one of regulation, fines and closure, foreign competitors could take Portuguese companies to the European Court of Justice and claim unfair competition on the grounds that Portuguese companies were not complying with EC law. The EAs helped avoid that.

Criticisms:

- The targets were not reached by all mills in 1991, the date when the EA was to become binding. With the exception of two mills, serious progress was made only following fines and public pressure;
- Some people hold the view that the EA gives companies the opportunity to delay before investing in environmental measures;

5.7 Assessment of Effectiveness

5.7.1 Environmental Assessment

5.7.1.1 The Reference Situation

Prior to the agreement, the environmental situation was as stated in Tables 5.3 and 5.4 (1987 figures).

5.7.1.2 The Baseline

Business as Usual

The baseline for the EA was taken to be the level of environmental performance at the time of negotiation and signature of the EA. Had there been no EA, it is likely that little would have been invested in environmental measures beyond those improvements linked to required investments in changes of capital stock. If the path chosen had been regulation rather than agreement, some companies would probably not have complied with the regulations, would have gone through a period of fines, negotiation and eventual investment. The most appropriate baseline for this assessment is, therefore, the environmental performance of the reference year 1987/88.

5.7.2 Environmental Improvement/Effectiveness

5.7.2.1 Environmental Improvement

The EA started with only two of the eight mills making significant investments in environmental improvements. Only two mills and one company, SOPORCEL, met the standards at the deadline of 1991. Following pressure through fines, court cases and negotiation, a further five mills made serious efforts to improve performance. Consequently, seven of the eight mills (the other one closed) showed marked environmental impact improvements over the period from 1987 to 1993, and further improvements by 1995. By 1993, nearly all mills had met all the standards laid down in the EA, and, in many cases, far surpassed them.

The greatest improvements were in water quality. Reductions in specific air emissions were also very significant. There were more modest improvements on waste reduction.

5.7.2.2 Environmental Effectiveness

Assuming that no significant emissions reductions would have occurred if no EA had been agreed, the baseline is thus close to the environmental situation in the reference scenario – although great uncertainty exists as regards the impact of fines and possible closures. Still, given the absence of a discussion of alternative instruments and the poor data available, no conclusions can be drawn on environmental effectiveness.

5.7.3 Assessment Against Wider Impacts

5.7.3.1 Economic Efficiency

The timescale of the EA allowed investments to be made more in line with the investment cycle of each company than probably would have been the case had mills been suddenly required to meet new legislation. Furthermore, it is likely that there would have been greater costs to the companies through fines and (possibly) closures, had no EA been in place. In addition, there has been some exchange of experience between companies which may have led to some cost reductions. The EA can therefore be regarded as being more cost-effective than the alternative of regulation supported by fines and potential closure. Still, no quantitative data are available to support this.

5.7.3.2 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 real innovation in the area of technical change.

5.8 The Future

5.8.1 Future Development of the EA and other EAs

5.8.1.1 *Past Improvements*

Initially, an EA required a global environmental plan. Now it requires a list of all companies and each company has to put forward a year-by-year environmental improvement plan that must be met. These plans cannot be changed except in exceptional circumstances or if new agreements or Community laws have come into force.

5.8.1.2 *Possible Future Improvements*

Suggested improvements of the EA could include:

- greater emphasis on the idea that EAs are there to solve problems and not to enforce the law;
- EA is an instrument for bringing people together. The increased dialogue role and value of EAs should be further developed;
- greater reliance on phased EAs, as having a firm end-date is of limited value;
- the inclusion of a more forward looking element, at least warning of future developments, as some EAs do not talk of IPPC;
- modest monitoring requirements – e.g. a report every six months or even every year (instead of every month);
- public access to the results of an EA through the publication of documents containing precise and detailed information on: participating companies/sectors and relevant data on them, standards, company specific water quality, emissions etc., to enable the public to see the real importance of the EA.

5.8.1.3 General Requirements for New EAs (Government View)

- initial diagnosis required;
- need for technical or expert advice (environmental consultancy companies);
- list of companies involved in EA;
- EA adoption plan for each plant;
- integrated approach – but with priorities depending on sector environmental impacts;
- focus on clean measures/processes, prevention rather than clean-up;
- no discussion on number of standards that have to be reached (as in this EA);
- no finite end-date to the EA, which should be seen more as a step in an ongoing process.

5.8.1.4 Other EAs

Other EAs are discussed in Section 3 on negotiation and context. A new EA for the pulp paper sector is not yet foreseen. More recent EAs have annual quantified targets, tied to specific agreed measures. These targets are staged, and, tightening year by year, comply with EU legislation, by the end point.

- Following the pulp paper EA (1988), three more were signed in 1989 and 1990 (though these were more protocols than EAs).
- These were followed by the signature of a Framework Agreement on EAs (1994) with the subsequent signature of around 10 further EAs.
- The new government, however, prefers more traditional instruments (regulation,

standards etc), and is freezing the current EAs (possibly as a further negotiation tactic which has been used before, even in the pulp paper EA).

- The use of Portuguese style EAs should be of great interest in countries where there is some difficulty in compliance with legislation, notably when the amount of new legislation being passed is too great to be assimilated by the, often under-staffed (sometimes non-existent), environmental teams in companies. They have a clear potential for other Cohesion Fund countries and new member states.
- More public involvement could ensure greater public pressure, though this may still be relatively insignificant given the embryonic NGO infrastructure and the low level of environmental awareness among the public, and, therefore, less delaying in meeting the targets. More participation could foster greater environmental awareness and further participation in future.

5.9 Conclusions

The Portuguese Pulp Paper EA, the first EA in Portugal, is generally regarded as a successful application of the EA instrument, despite the fact the many of the mills failed to meet the targets within the agreed timescale. It is regarded as a success because the environmental performance in 1993 was improved significantly beyond the targets set, and the EA has been influential in the development of a whole series of other EAs across a range of other sectors.

5.10 Information Sources

Interviewees

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6. Case Study 6

Denmark: Agreement on Recycling of Transport Packaging^{*}

6.1 Summary Information on EA

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

p 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 re-use of packaging and recovery/recycling of materials.
p Target	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 Start Date	August 1994
p Timescale	Six years; to August 2000.
p Number of Signatories	Two main and two acceding.
p Parties	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).
p Type of EA	Implementation Agreement, based on a target derived from the 1992 Government Action Plan for Waste and Recycling, to implement the EC Packaging and Packaging Waste Directive (94/62/EC)
p Sanctions/ Enforcement Mechanisms	There are no explicit sanctions. Public and peer pressure are seen as a threat to free-riders. Implicit sanctions were imposed 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 introduced since the mid 1980s.
p Other provisions/ principles	The agreement was used by industry to apply the 'shared responsibility' principle for the costs of meeting the target.
p Legal Basis	A politically binding gentlemen's agreement. The agreement has no legal basis

^{*} The case study was revised by Ellen Margrethe Basse (CESAM, Århus Universitet, Århus).

6.2 Background and Context

6.2.1 The Country Context

Since the mid 1980s, environmental regulations in Denmark have been subjected to several rounds of reform, on pollution with an emphasis prevention rather than abatement as the overall policy goal. Consequently new policy instruments such as environmental agreements, technology promoting standards, incentives and, to an extent economic instruments have been added to the first generation of science-based emission standards. Over a decade ago, the Danish Federation of Industri, Dansk Industri, said 'Industry has reached the regulatory limit, and could take no more' (Dansk Industri, 1983). Industry's stance has since changed to a more proactive approach that acknowledges that international competitive advantage can be achieved through stringent regulations (Dansk Industri, 1993).

Regulatory reforms have tried to address both problems of administration in reaching policy goals and of relying on direct regulation, rather than market based instruments (Miljøministeriet, 1988). The current Danish environmental policy approach was marked by the publication of the government's Action Plan for the Environment and Development – Our Common Future 1988, which indicated a change to a strategic environmental policy approach. A number of policy changes followed, culminating in revisions of the original 1974 Environmental Protection Act in 1991 and 1994 to form the Consolidated Environmental Protection Act 1994 (CEPA), one of the key elements of policy, which gives priority to pollution prevention via permitting and licensing procedures.

Although Denmark is an unitary state in which the central government has a good overview of the situation and great influence, the practical implementation of environmental policy is now based on the decentralisation of responsibility and authority from the Minister/Ministry of Environmental Protection (EPA) to regional and municipal levels of government. As municipalities

account for about 65% of public expenditure on the environment, they have a long tradition of negotiation on laws and bylaws and considerable experience of the imposition of economic obligations and the costs of implementing legislation. Enforcement of regulations is carried out, largely, at the level of the individual municipality. This is because municipalities have a lot of discretionary power, which results in municipal enforcement by consultants/service partners or by policemen (Georg, 1995). Regulatory enforcement is characterised by a low level of conflict and low involvement of the judiciary system (Ministry of the Environment, 1985).

6.2.2 History of Environmental Agreements in Denmark

Denmark has a tradition of high levels of organisation and negotiation in both commercial and environmental matters: realising that the investments necessitated by environmental requirements would have to be paid for by enterprises themselves, the Danish EPA tried to gain the acceptance of trade and industry.

Uniquely in Europe, there are provisions for agreements in administrative law, embodied in S10 of the CEPA 1994 which empowers the Minister to make binding agreements with enterprises or trade associations with the aim of pollution reduction/waste minimisation and enables him/her to decide upon the implementing instruments for the agreement.

The Minister can also appoint persons to be responsible for implementation, set performance rules and reporting arrangements and lay down penalties for breaches, although disputes over content are the domain of industrial tribunals. Such an agreement requires negotiations with relevant national trade and environment organisations, local authorities and other state authorities and the agreement's requirements may be imposed on other companies/associations not party to the agreement, if they are substantially responsible for the waste in question. The Minister also has authority to change conditions or requirements in the agreement. The provision provoked considerable debate

Table 6.1: Danish Industry

Main branches of Danish Trade & Industry (500,000 employees)	% of GDP	Ranking of highest pollution impact
Iron & metal	35	1
Food, drink & tobacco	19	3
Chemical substances	14	2
Paper & printing	10	
Wood & furniture	5	

in Parliament in 1991, particularly over the power given to the Minister, the implications for local authorities' influence over industry and the favourable reaction of industry organisations. However, no trade and industry organisation has since been willing to enter into binding agreements of the type suggested in the provision, mainly because of the binding and policy role required of industry organisations to secure compliance. S10 of the Act has, therefore, proved redundant.

In the past decade, the trend has been for new environmental requirements to be intensively negotiated with Dansk Industri or other affected organisations. Only in exceptional circumstances has the Minister for the Environment insisted on unilaterally imposing his will. In return, Dansk Industri has accepted the requirements adopted and has often helped to gain its members' acceptance of them. This has resulted in a number of agreements entered into by Environment Ministers, including agreements on waste, e.g. lead accumulators and cadmium battery agreements (Ostergaard, EPA; Blom, Dansk Industri). Usually the government promises to desist from political intervention if the other party promises to work towards a specific environmental goal. Some of these agreements have brought about the desired environmental results. One example is the Danish Oil Industries Environmental Clean-Up Association and PVC Agreement, where

the positive results achieved are attributed to the direct negotiations (EPA Web Site, 1996).

Compliance with the agreements cannot be enforced through the courts, and each of the parties can withdraw from the agreement at any time. The agreements are solely politically binding in character. Although no formal evaluation has been undertaken of the 12 agreements at present in force, partly because they have not been in operation for very long, they are seen as a useful policy tool. However, in one case a tax on nickel-cadmium batteries had to be introduced, after an environmental agreement on the collection of used batteries of this kind had failed (Danish Ministry of Finance, 1995, p. 23f.).

6.2.3 The Environmental Issue

6.2.3.1 Packaging Waste and Its Significance

Industrial pollution is a major problem in Denmark, with commercial waste forming a major waste stream and, of this, transport packaging constitutes about 50% of all packaging waste (Ostergaard, EPA). Packaging waste is, therefore, seen as one of the most rational, highly concentrated ways of achieving both national and EU waste targets (EPA 1996b). Transport packaging plays an important role in the Government's Waste Action Plan, the strategic basis of official waste policy from 1993-1997 and fits into the

an overall recycling target of 55% of all waste by the year 2000 (of the remaining waste, 25% waste is to go to energy recovery and 20% to landfill).

Focusing attention on transport packaging also implements the 'producer responsibility' principles contained in the CEPA 1994 and partly implements the EC Packaging and Packaging Waste Directive 94/62/EC (hereafter referred to as the EC Packaging Directive).

6.2.3.2 History of Packaging Waste and Transport Packaging

Recycling and waste regulations go back to the mid-1980s, when waste management was already seen as central to environmental policy. CEPA 1994 targets reflects this. Their aim is:

'to reduce the use and wastage of raw materials and other resources, to promote the use of cleaner technology and to promote recycling and reduce problems in connection with waste disposal. When determining the extent and nature of measures to prevent pollution, consideration shall be given to: (1) the nature of the physical surroundings and the likely impact of pollution thereon, and (2) the whole cycle of substances and materials, with a view to minimising wastage of resources' (Ministry of Environment, 1992a).

6.2.4 The Sector

6.2.4.1 Structure of Sectors Affected by the Agreement

Transport packaging covers a long chain of industry sectors, from producers and importers, to manufacturers, converters, packers and fillers, users, retailers and recyclers – many of whom come from very different industrial sectors and are connected only by virtue of being users or sellers of transport packaging. The distribution is shown in Table 6.1. Danish enterprises are small by international standards, with 80% of jobs

found in SMEs of less than 500 employees and less than 300 companies employing more than 500 employees.

6.2.4.2 Environmental Awareness

The environmental awareness of industry is seen as high in Denmark. This has been attributed, partly, to a number of widely publicised disclosures of companies violating environmental regulations but also to a high level of public awareness from the early 1980s on and to changes in the administrative and regulatory environmental practices of the municipalities (Georg, 1995). The strength of the Danish EPA and Ministry of Environment also plays a key role in industrial awareness.

Awareness of the environmental impact of transport packaging is seen by all parties as medium to high and increasing, partly because of previous regulations in this area for some businesses and industry and, partly and indirectly, to the effects of the agreement, particularly in the case of SMEs via the trade associations. It is also indicative of a willingness of industry to be environmentally aware (Ostergaard, EPA) and this has resulted in a minimum level of concern and positive action, for example in the development of environment friendly products and better supply chain management (Blom, Dansk Industri; Niklasson, Emballageindustrien).

6.2.4.3 Sector Compliance With Legislation

Industry has generally complied with waste management legislation to date. Paper waste for retailers and municipal waste collection schemes, for example, have been seen as 'fairly successful', although there are no formal evaluations to support this view (Ostergaard, EPA). There have been problems in regulating this area efficiently and in assessing compliance as there are no data on past recycling rates for many materials apart from paper, the recycling rates of which have been recorded as a result of the 1986 Regulation on recycling paper (Blom, Dansk Industri; Niklasson, Emballageindustrien).

6.3 Negotiation of the Agreement

6.3.1 Negotiation Time

The Agreement took about two and a half years to negotiate. This compares with an average of two years to conclude other agreements and to the lead-in time for environmental legislation, which can be anywhere from between six months to five years (Lorenzen et al 1995; Elmvang, EPA).

6.3.2 Parties Involved in the Negotiations

A total of 10 parties were involved in the negotiations (see Table 6.2). All parties were well established bodies or trade associations at the time of the agreement. With the

exception of the EPA, none of the other parties have legally binding powers over their members but are purely representative bodies.

The Danish Ministry of Environment and Energy with its administrative branch, the EPA, is a relatively strong ministry, with power of authority over industrial polluters. The ministries responsible for the sectors in which the polluting industries are located have not played any role. However, the level of environmental awareness in a polluting sector is considered to be an important factor in determining the results achieved (EPA Web page 1996). Dansk Industri is one of the most influential trade associations in Denmark, being long-established and representing most trade and industry.

Table 6.2: Negotiating Actors and Signatories in Danish Transport Packaging Agreement

Actors	Type of Actor	Party to Negotiation	Signatory	Agreement Working Group	Comments
Miljøstyrelsen, EPA	Central government	•	•	•	Non-binding main signatory
Kommunernes Landsforening	Local government	•		•	Legislative implementation authority
Frederiksberg Kommune	Local Government			•	Special municipal/county status
Kopenhagen Kommune	Local Government			•	Special municipal/county status
Dansk Industri	Industry	•	•	•	Non-binding main signatory
Emballageindustrien	Industry	•	•	•	Non-binding acceding signatory
Plastindustrien	Industry	•	•	•	Non-binding acceding signatory
Dansk Handel Service	Industry	•		•	Views too disparate from other industry
Paper/Pulp & Recycling Mills	Industry	•		•	Initial consultations over capacity only
Forbrugerrådet	Consumer organisation	•		•	Consultees
CO-Industri	Employees organisation	•		•	Consultees
Danmarks Naturfredningsforening	Environmental NGO	•		•	Consultees

The labour organisation, CO-Industri, does not play such a prominent role in environmental policy as industry sector organisations. However, it is routinely involved in the drawing up of new legislation. The most powerful municipal organisation is the National Association of Local Authorities in Denmark, Kommunernes Landsforening (KL), which represents all Danish municipalities, other than Copenhagen and Frederiksberg, and is extremely powerful in the area of environmental policy. KL's influence arises from its apolitical nature and its primary objective which is to safeguard and strengthen local self-government. It is legitimated by the fact that rulings on environmental questions are initially made by local politicians and by the considerable practical experience in environmental administration of municipal officials, which adds a professional dimension to KL's role in environmental policy-making. The Association of County Councils in Denmark does not have the same political clout and weight as municipal politicians. Nor does it present such a united front on environmental matters, although county officials often have considerable expertise and influence.

Danmarks Naturfredningsforening (Danish Society for the Conservation of Nature) (approx 250,000 members) had considerable influence in the 1980s but has since declined, and other 'green' organisations, such as Greenpeace (approx. 20,000 members), have occasionally had some influence. Taken together, though, nature and environmental organisations have not had anything like the same influence as the Confederation of Danish Industries or KL.

6.3.3 Their Reasons and Incentives for Participating

A major reason for government's willingness to participate in the agreement was to find the most cost- and environmentally-effective solutions to meet the targets of the forthcoming EU Packaging Directive. The EPA were also keen to reach a complementary solution through an agreement rather than by

going through the full legislative process (Ostergaard, EPA). The Minister was clear that 'something' would happen if an agreement was not reached, but never stated exactly what the consequences of failure to reach an agreement would be (Ries, KL).

A major incentive for industry was this implicit, unclear threat of either legislation or other economic/fiscal instruments. This was perceived as a real threat by Dansk Industri and the two trade associations in the event of the agreement failing. Firms are offered no additional benefits for participating in the agreement, other than the promise of no direct regulation of individual firms, only of industry via municipal legislation. Industry is obliged to control its packaging waste under the CEPA 1994, the Waste Action Plan and the EC Packaging Directive. The CEPA requires all manufacturers and users to contribute to the limitation and recycling of waste. The Minister can regulate deposits, impose binding targets to limit the use, discharge or disposal of specified products or materials and has legal authority to claim producer responsibility. The agreement was used to apply the principle of 'shared responsibility' to the financing of waste disposal, to enable industry to allocate responsibilities and costs more flexibly and to ensure that the costs of environmentally friendly packaging are fairly allocated and absorbed across industry instead of by consumers (Blom, Dansk Industri; Arnoldsen, Danisco Pack). For individual companies, membership of one of the participating trade associations provides the opportunity for direct representation to the EPA. DHS pointed out that they see little incentive for some producers/industry to participate if they are not bearing the costs of collection or sorting, e.g. when this is passed on to other parties such as retailers, who are not part of the agreement (Biil, DHS).

Local government participated because of its major role in industrial waste collection and recycling. The agreement indirectly binds the Kommunes, as of 1 July 1998 and they have to provide collection and re-use schemes (Bylaw on the Disposal and Re-use, Planning

and Registration of Waste 24 June 1996), privately or publicly, and are thus committed to collecting waste from producers. The by-law contains only 'soft targets' stating that 'substantial parts of the waste should be re-used', but these are in line with the Government's Waste Action Plan and EC Packaging Directive and therefore also the agreement. The Kommunes also foresaw the agreement as having a unifying effect and used its targets as a base for subsequent standard regulations to deal with transport waste and to standardise the different waste collection and disposal systems developed over the past 20 years by individual or groups of municipalities. As municipalities charge fees to finance waste systems, whether these are operated by the authority or subcontracted privately, it was also important for them to be involved in the negotiations regarding recycling capacities, projections of waste volumes and material types (Environmental Protection Agency 1992, Kommunernes Landforening 1990, Reis, KL).

All parties saw the agreement as a way of further increasing awareness of transport packaging. The good relationship between Dansk Industri and the EPA, the history of largely successful negotiations, and the mutual respect and medium to high levels of trust that developed among all the parties further increased the acceptability of an agreement as a valid first approach to the issue. Dansk Handel Service (DHS), for example, are used to negotiating with the Industry Ministry but agreements are a relatively new element in their working relationship with the EPA with whom they have a more strained and less stable relationship. They believe, however, that the EA is a step in the right direction.

6.3.3.1 Expected Benefits

Industry

- Total packaging chain coverage
- Distribution of obligations over sector, among different branches, and over time
- Responsibility spread across all industry
- Self determined cost allocation
- Flexibility in cost allocation, e.g. importer/exporter obligations.
- Pragmatic approach to capacity and capability
- Generally cost effective (profitability can depend on market prices)
- Cost neutral implementation on average
- Advocates only cost-effective recycling/recovery technology
- Long term agreement allows for investment plans
- Representation of interests directly to EPA over future obligations
- Improved co-operation
- Increased influence of industry on measures to achieve goals.

Regulators

- Promotion of a greater understanding of industry
- Positive scope for discussion with all parties
- Securing of compliance with basic measures and beyond legal requirements
- Targeting of a new area e.g. materials previously unrecovered/recycled
- Increased level of dialogue among regulators, authorities and industry
- Provision of a Framework Agreement for national implementation by industry and municipalities.

Table 6.3a:
Structure of Signatories and Parties to Danish Transport Packaging Agreement

Sector	Trade association	Industry coverage	Nr of Members	Proportion of SMEs
General Industry	Dansk Industri	80%	4,200	75% SMEs ¹ 25% large companies = 80% of total membership ¹
Plastics industry	Plastindustrien	80-85%	340	60% approx.
Paper & Board converters	Emballageindustrien	90%	n/a	60%
Retail and Trade	Dansk Handel Service (DHS)	75% approx	n/a	70% approx.
Municipalities	Kommunernes Landsforening (KL)	100%	285	n/a
Paper & Pulp Mills	-	100%	n/a	n/a

¹ Calculated on the basis of proportion of salary turnover in Denmark

6.4 Structure of Agreement and the Targets

6.4.1 Number and Type of Signatories

Of the four signatories, two main signatories are Miljøstyrelsen (the EPA) and Dansk Industri. The national packaging industry trade associations, Plastindustrien and Emballageindustrien were acceding signatories.

It is important to note that not all parties involved in the negotiations were also signatories to the agreement. This is partly due to the fact that all companies handling transport packaging, from industry to retailers, are obliged to participate in municipal waste collection and sorting schemes. This then extends the issue to the municipalities, who are responsible for ensuring the implementation of waste collection schemes. KL was a party to the negotiations, but felt unable to sign, because of political commitment, its legal role in municipal law making and implementation and uncertainty over the economic and technological feasibility of the goals. The Executive Order on Waste has been amended (in order to help reach the goals laid down in the EU Directive on Packaging and Packaging Waste), so that, from July 1998, the municipal authorities will

be obliged to collect certain types of waste (e.g. plastic transport packaging) from private enterprises. This will mean that the agreement is, in fact, being implemented through formal rules. The retailers association, DHS, was also originally party to negotiations, but left prior to signing, as their views on the responsibility of retailers receiving transport packaging and on a perceived conflict with the 1986 Executive Order on waste paper, were too divergent from the other parties for an agreement to be concluded. Both parties, however, have welcomed the opportunity to be part of the Agreement Working group and feel that this indicates commitment enough to the goals of the agreement.

In contrast, the signatories (industry, producers and central government), all of whom have obligations to reduce packaging, are not necessarily those who are wholly responsible for fully implementing the agreement. The implementers are, rather, the municipalities, retailers and some industry. This means that the responsible parties are not the actual producers of the product that becomes waste, but rather the bodies that ultimately have to get rid of the waste. However, all parties are involved in the Agreement Working Group and work together on a practical basis. This development can

partly be explained by the history of the negotiations and the relationships that developed between parties during them with each party trying to allocate responsibilities on a least cost basis.

6.4.2 Coverage as Proportion of Market

Dansk Industri estimates that 90-95% of industry is effectively covered by the agreement. This comes to around 25,000 companies (Blom, Dansk Industri). The other 5-10% are mostly SMEs. In practice, about 80% of the packaging chain is covered: of this, 75% are comprised of signatories to the agreement i.e., central government, industrial manufacturers and producers, and the Working Group members who cover the remaining 25% of retailers and services, local authorities and interest groups. The 20% not included in the agreement are effectively covered indirectly by municipal executive orders governing waste sorting and collection.

6.4.3 Source of Transport Packaging Waste and Proportion of Total Waste

50% of all transport packaging in Denmark, is imported and, conversely, 50% of Danish-produced packaging is exported. However, all packaging waste, whether produced internally or imported, is covered by the agreement.

Industry and commerce generate 'most of the waste in Denmark'. The quantity of industrial and commercial waste exceeds domestic household waste. Transport packaging waste constitutes 50% of all industrial waste (Ostergaard, EPA). Data on where transport packaging originates and ends up are unavailable. The København Kommune, however, has assessed primary packaging, which goes direct to the consumer, and secondary packaging, which is used along the product chain, for plastics and calculates that of the total of 33,000t of plastic waste involved, 88% came from industry. The approximate proportions of transport packaging waste being handled by the various groups are: manufacturers 25%, retailers 20%,

producers/packers/fillers 50% (Blom, Dansk Industri).

6.4.4 Targets Set

The overall target is that 80% of the volume of transport packaging should be collected and recycled, either through direct re-use or material recovery, by the year 2000 (See Table 6.3b). This includes all forms of transport packaging destined for Danish manufacturing firms, excluding exports but including imported transport packaging.

This target was not negotiated but was 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 which applied, initially, to paper. The overall target contains specific quantitative and qualitative targets. However, the specific goals for materials, the means used to reach targets and the allocation of responsibilities were negotiated. Interim targets for the year 2000 were also negotiated on the basis of predictions of recycling and collection capacities.

There are no targets for individual companies in the agreement and no relation between overall targets and the sum of company targets. The targets are industry-wide goals for everyone dealing in transport packaging. The goals, however, are translated into obligations on individual companies to participate in municipal collection, or other recognised, schemes.

6.4.5 Quantitative Targets

This target is divided further into specific quantitative targets for material types.

6.4.6 The Timescale

Six years: August 1994 to August 2000.

6.4.7 Termination Provision

All parties must give three months' notice in the case of legislation or new regulations significantly changing the prerequisites of the agreement, and if agreement cannot be reached.

6.4.8 Assessment of the Targets

All parties see the targets as moderately ambitious but achievable. They go above the quantities suggested in the packaging directive and beyond a 'business-as-usual' approach – mainly because this is a new area for recycling of waste. Furthermore, this reflects a 'no regrets' policy, where most businesses accepted that recycling was necessary and could even be profitable and good for business. 'It is absolutely possible to reach the goals set out in the agreement' (Jens Arnoldsén, Dansico Pack)

6.4.9 Legal Status

The legal status is that of a non-binding, non-legal, gentlemen's agreement. This agreement was not formulated to come under S10 of the CEPA and is not, therefore, legally binding. However, the agreement is, in effect, translated into a legal obligation under municipal law for individual companies who are required to join municipal waste

collection, or other recognised, schemes (Reis, KL). There are no legal penalties for non-compliance with the agreement per se but there is a veiled threat of regulation or economic instruments and a strongly felt moral and political pressure to comply. (Blom, Dansk Industri; Ostergaard, EPA).

DHS has raised the question of an apparent contradiction with S9a of the CEPA and the principles of producer responsibility, arguing that these have not been properly applied in this agreement (i.e. that all those responsible are not formally part of the agreement) and raising the possibility of a conflict between the agreement and the law (Biil, DHS). In practice, however, S9 and S10 have been used only once.

Note: No targets are set for:

- distribution between re-use and recovery;
- recycling for packaging purposes;
- reduction in total volume of packaging.

Table 6.3b: Quantitative Targets in the Danish Transport Packaging Agreement

Material	Supply Volume (tonnes) at baseline year	Recycling Target %			
		1996	1997	1998	2000
Plastics^a	<i>Estimated</i>				
LDPE	25,000	-	50		80
HDPE ^b	11,000	-	70		80
EPS	5,000	-	50		80
PP	6,000	-	40		80
Other plastics ^c	12,000	-	-	-	-
Plastic Total	59,000	-	52	-	80
Paper	<i>Actual</i>				
Corrugated board	164,000	70	70	80	80
Other board	50,000	50	70	80	80
Paper	45,000	50	50	80	80
Paper Total	259,000	56	63	80	80
Packaging Total	318,000	56^d	57	80^d	80

Sources: Status Note on Transport Packaging 28 May 1996, Transportemballage Agreement 1994, Rendan 1996

^a Solely preliminary recommendations for targets and timescales, dependent on the November 1996 analysis report prepared by Dansk Industri and Rendan to map actual supply volumes.

^b Currently no available technology for recovery of HDPE, EPS and laminated plastics materials.

^c No targets set for 'Other plastics' in the agreement.

^d Not including plastics.

Table 6.3c: Qualitative Targets in the Danish Transport Packaging Agreement

Responsible Party	Action	Date
Municipalities	Extension of existing recycling schemes to include collection and recycling of transport packaging made from plastics and to include all types of commercial activity generating transport packaging. Collection programmes should be implemented in step with the supply of processing systems. Preparation of standard regulations to help municipalities prepare individual regulations for commercial waste (taking into consideration cost effectiveness of recycling and waste volumes).	
Municipalities & Recovery & Recycling Industry	Recovery capacity and the market for recovered products must be developed and an increase in recycling must be achieved by developing existing waste and recycling schemes and the existing recovery industry.	
Dansk Industri	Environment-economic studies to be carried out prior to any decision on the increased recycling of various materials.	
Dansk Industri Emballageindustrien Plastindustrien	Promotion of a reduction in the volume of packaging material per unit (no concrete targets set). Trade associations jointly assume the obligation to work towards increasing the recycling capacity of industry to meet targets, especially in plastics, with Dansk Industri assuming an overall obligation to take necessary initiatives. Trade associations jointly assume the obligation to finance the information tasks of industry and the operation of the Agreement Group. Recycling promoted by packaging size, type and materials selected to optimise re-use and recovery possibilities, with regard to functionality, resource minimisation and environmental impact.	
Dansk Industri	Preparation of specifications of fractionated materials for separate collection. Analysis of metal, textile and wood transport packaging supply volumes, concrete targets and timescales may then be set.	August 1995
Dansk Industri and Municipalities	Establish Agreement Working Group Secretariat. Consultation with KL over introduction of waste regulations to require companies to sort waste at source and provision of descriptions and specifications for recyclable materials.	
Plastindustrien	Technology to be developed and made available to achieve targets for other HDPE, EPS and other plastics.	
Dansk Industri, Emballageindustrien, Plastindustrien, Kommunernes Landsforening, CO-Industri, København and Frederiksberg Kommuner	Set up the Agreement Working Group.	
Agreement Working Group	Evaluation of the results of the agreement and recommendation to the parties to the contract, of changes and supplements to the contract. Evaluation of the results of analyses, including environment-economic analysis, in co-operation with affected industries. Registration of recycled material volumes and preparation of annual report for Minister. Monitoring of fulfilment of targets and time limits. Monitoring of implementation of municipal regulations on sorting at source. Registration of any unintended environmental effects. Recommendation of changes and supplements to the agreement to parties. Implementation of development projects to promote recycling of transport packaging waste.	Initial Report due April 1996. Annually thereafter
Agreement Working Group Secretariat	Solution of administrative tasks relating to agreement.	

6.5 Implementation

6.5.1 Distribution of Responsibilities Between the Partners

Responsibilities are assigned to both parties to the agreement, to their members and to members of the Agreement Working Group as prescribed in the agreement targets (See Table 6.3a and 6.3b). Implementation is also via sub-groups of the Agreement Working Group, known as Materials Working Groups, arranged along industry sector and materials types and via negotiations between the industry associations and their members (Østergaard, EPA). Targets will, to a large degree, actually be fulfilled by individual companies joining municipal waste collection schemes and complying to sorting and disposal requirements aimed to meet the agreements targets.

6.5.2 Use of Complementary Measures

- The agreement complements and supplements a number of other regulatory measures:
- Executive Order on Certain Demands for Packaging 1996
- Consolidated Environmental Protection Act No. 590, 27 June 1994 (last amended April 1996)
- EC Packaging and Packaging Waste Directive 94/62/EC
- Regulation 131 on the Disposal, Planning and Registration of Waste, 21 March 1993 (last amended June 1996)
- Government Action Plan for Waste and Recycling 1993-1997 (1992)
- Act 1701 on Taxation of Waste and Raw Materials, 23 December 1992
- Regulation 882 on Municipal Collection Schemes for Recyclable Materials and Products from Commercial Companies, 11 December 1986
- Amendment to the Act on Recycling 1984

- Waste Management Plan 1982 (for completion by municipalities in 1990)
- Act on Recycling 1978
- Municipal regulations on waste sorting, collection, disposal and treatment.

The Waste Action Plan and CEPA play important framework roles, requiring all manufacturers, users and consumers to contribute to the recycling of waste and the limitation of waste disposal problems. It is then 'up to industry, trade and municipalities to fill in the frame with practical arrangements which ensure fulfilment of the goals in the transport packaging agreement and, thereby the directive' (Ministry of the Environment, 1996b). Municipal waste collection schemes and regulations further complement and implement the agreement.

6.5.3 Monitoring Arrangements

Monitoring is coordinated by the Agreement Group members. The first report was at the end of the initial 18-month period. Henceforth, reports are to be produced annually. The progress of the agreement and its relation to the targets are also discussed among signatories. In the first year and a half of the agreement, meetings were held every month; now they occur roughly every three months, on an 'as-and-when-needed' basis, subject to a minimum of one meeting per annum. The issues monitored (in tonnes) are:

- Volumes of waste recycled
- Waste supplied (i.e. sent to the market)
- Material type (paper, plastics, metal, textiles, wood)
- Proportion of imported/home-produced waste.

6.5.4 Reporting Arrangements

The results of analyses, monitoring, annual reports, developments and statistics are circulated among all parties and the Agreement Working Group and are open to public scrutiny, largely via government-published statistics and bulletins. Information

is passed around members of the Working Group as is relevant (e.g. to individual municipalities and to companies in that municipality, to individual companies in associations etc.). The annual report is the main reporting tool. The first of these was published in November 1996, seven months later than the suggested target date. If targets

are not met, Dansk Industri is obliged to make information more widely available, which would mean incurring the extra cost of having to target companies that are not members of the trade associations in the Agreement Group.

Table 6.4: Monitoring and Reporting Parties

Party	Nature	Responsibilities
Rendan	Independent environmental and waste consultants	Contracted by the Agreement Working Group to produce data on the achievement of targets.
Municipalities	Local Government	Municipalities feed data into ISAC (Information System on Waste and Re-use), run by the EPA, on all types and quantities of waste streams received and treatment. Issues annual reports and distributes results of analyses to individual municipalities.
Konkurrence Rådet (Danish Competition Council)	Central Government Agency (Ministry of Industry)	Acts as an economic watchdog on aspects of competition.
Individual Companies	Industry & Commerce	Companies also have to carry out a degree of self-assessment when complying with municipal schemes.
Agreement Working Group		Evaluates results of analyses, including environment-economic analysis, in co-operation with affected industries. Monitors fulfilment of targets and time limits, report annually to Minister. Registers recycled material volume and reports annually on volumes and expectations for next year to Minister. Monitors technical, economic and environmental developments and uses experiences through continual adjustment of agreement.
Trade Associations	Industry	Distributes first to their members, as relevant, and, if the agreement is not fulfilling targets, then also to companies outside their membership.
EPA	Central Government	EPA informs the Ministry and other government departments. EPA runs ISAC 'Information System on Waste and Re-use'; a waste reporting scheme for which municipalities and companies provide data. Reports on received quantities of waste and re-use, to provide a national view. Statistics also published as government statistics in government journals and sent to EC as required by EC Packaging Directive.

6.5.5 Arrangements for Participation of NGOs or Consumer/Public Representatives

Under the CEPA 1994, S10, before implementing an agreement made with industry, the Ministry should negotiate, not only with the relevant authorities and organisations but also with the organisations specified in S11, i.e. 'the most relevant national trade and environment organisations, organisations of local authorities and with other state authorities involved, including the Minister of Labour.' If an agreement is not made under this section, there appears to be no such requirement, although in practice this is what usually happens (Georg, 1995). However, a low level of public participation is found in practice. Under Danish administrative law, parties with a 'significant individual interest' have the right of complaint. Since 1982, this has been available, not just to 'neighbours', but also to the major environmental organisations, including Danmarks Naturfredningsforening and Greenpeace. During the initial negotiations on the transport packaging agreement, the EPA invited Danmarks Naturfredningsforening, Forbrugerrådet and CO-Industri for comment. The latter two are part of the Agreement Working Group, although Greenpeace and the Naturfredningsforening appear to be no longer actively involved. The EPA was uncertain about the level of any other public interest or of any requests for information or public participation.

6.5.6 Public Access to Information

Public access to information is not generally an issue in Denmark, due to the well-developed 1970 Freedom of Information Act, an open press and media system and a tradition of free access to administrative information (Ministry of Environment 1996b). Public access to the agreement and all reports, official documents and statistics is possible through the EPA.

6.5.7 Penalties for Non-Compliance

There are no official penalties for non-compliance, i.e. for either party failing to meet the targets. The perceived penalties are, rather, the threat of regulation, other economic instruments (which are seen as a worse threat) and the negative impact on moral and political public commitments (Blom, Dansk Industri; Ostergaard, EPA). However, penalties exist outside the agreement to enforce company responsibilities in municipal collection schemes and, at the end of the day, a municipality can take a company to court or refer it to the Home Affairs Minister, although in practice discussions are usually held to find solutions (Reis, KL)

6.5.8 Enforcement and Measures for Dealing with Free-Riders

The first step in enforcement is seen as gaining acceptance among the majority of industry by negotiating the agreement, following this, measures such as reporting and monitoring requirements, goodwill, political will, co-operation, avoidance of public criticism and bad publicity are seen as the main pressures and tools for enforcing the agreement (Ostergaard, EPA). For example, companies that are not members of the trade associations will be targeted and the Working Group will direct discussions to problem areas in materials flows for the Materials Working Groups to monitor and to implement suggested remedies (Blom, Dansk Industri). This approach is backed up by second-line legislative enforcement: monitoring by municipal environmental officers achieves an annual average of 90% environmental compliance rate; the judicial system is relied on for the remaining 10%, about 200 to 300 cases per year, with criminal or civil penalties (Ministry of Environment 1996b). The EPA states that enforcement will be increased only if the scheme does not reach targets (Ostergaard, EPA).

All industries, except those which are legally exempt, must join either a municipal or a recognised waste-collection scheme. In practice, Dansk Industri accepts that there may be a minimal number of physically isolated companies, particularly SMEs, acting illegally as 'free-riders'. However, none of the parties to the agreement saw free-riders as an issue.

6.5.9 Provisions for Review of Progress, Revision of Targets, Setting New Targets for the Future

There are provisions for both positive and negative revision of targets and to allow parties to revise the agreement, if a number of preconditions are eliminated or radically changed or if new legislation is introduced in the area. This is decided at Agreement Working Group meetings and is based on the results of agreed analyses and attaining interim targets and on the imperative of meeting the EC Directive's goals and of avoiding subsequent infringements of EC law. Progress is reviewed annually by the Working Group, at which time targets may also be reviewed or changed (Blom, Dansk Industri; Niklasson, Emballageindustrien).

6.6. Outcome

6.6.1 Reported Progress Towards Meeting the Targets

The first progress report, the Status Note, was delivered to the Environment Minister in May 1996, and the first annual report published in November 1996, 18 months after the implementation of the agreement. Progress has been reported by all parties. The report contains a number of estimates concerning the current supply and level of recycling of transport packaging waste fractions, based on surveys and analyses by Dansk Industri and Rendan. The most important results are presented in Tables 6.5a and 6.5b. It should be noted that the recycling targets achieved and reported in the table are drawn from the

Rendan monitoring report and are based on the data available on transport packaging supply and recycling volumes for 1994 and 1995.

All parties believe they are on target to achieve current goals.

6.6.2 Proportion of Firms in the Sector Participating in the Agreement

Figures are unavailable on the actual numbers of companies implementing the agreement (Ostergaard, EPA), as this depends on municipal collection schemes. However, some municipalities report a doubling of waste recycling in general to about 60% since 1992, with about 35% of commercial waste being recycled, particularly in cardboard, paper and glass, which can be roughly extrapolated to transport packaging (Maskell, København Kommune).

6.6.3 Effect of External Factors on Progress to Set Targets

World market prices for recycled materials have fluctuated heavily in the past five years (Ministry of the Environment, 1996d), for paper waste in particular and this has severely affected the profit incentive to join recycling schemes by increasing or decreasing the attractiveness of recycling and thus the rate of profit in waste disposal. Dansk Industri attributes the success in signing the agreement partly to favourable economic circumstances at the time.

The situation of municipalities as quasi-legal monopolies for collection and recycling of waste has been questioned by DHS. More competition is thus envisaged, for example through the use of private contractors (Ries, KL).

Anti-competitive behaviour arising from agreements in general has been examined by Konkurrence Rådet. However, this agreement has not yet come under scrutiny, mainly because of its total coverage of the area.

Table 6.5a: Results of the Danish Transport Packaging Agreement: Progress to Quantitative Targets

Material	% of Total Transport Packaging	Supply Volume (tonnes)	Supply Volume (tonnes) Reference situation	Actual Recycling Volume (tonnes)			% Re-cycling achieved	% Interim & Final Recycling Targets		
Year	1994	1990-1991	1994	1994	1995	1996	1994	1996	1997	2000
Plastics^a		<i>Estimated</i>	<i>Actual</i>							
LDPE	10.8	25,000	22,350	n/a	6,200 ^e	n/a	30		50	80
HDPE ^b	2.4	11,000	6,100	n/a	3,600 ^e	n/a	80		70	80
EPS	0.8	5,000	6,150	n/a	100 ^e	n/a	5		50	80
PP	2.3	6,000	4,000	n/a	150 ^e	n/a	5		40	80
Other plastics ^c	1.4	12,000	n/a	-	-	-	-		-	-
Total Plastic	18	59,000	38,600	n/a	10,000 ^e	n/a	30*	-	52	80
Paper		<i>Actual</i>	<i>Actual</i>							
Corrugated board	35.2	164,000	229,484	n/a	139,152	114,800	60	70		80
Other board	8.6	56,000	13,393	n/a	n/a	28,000	35.7 ^d	50		80
Paper	5.4	45,000	39,281	n/a	18,787	22,500		50		80
Total Paper	49.3	259,000	282,158	n/a	157,739	165,300	56.0 ^f *	56*		80
Total Paper & Plastic	63.6	318,000	320,758	n/a	167,739	n/a	n/a	n/a	-	80
Other Materials^g										
Metal	10.4	n/a	88,498							
Textiles	0.1	n/a	1,843							
Glass	18.3	n/a	156,361							
Wood	7.6	n/a	64,532							
Total	100	n/a	852,461	n/a	n/a	n/a	n/a			80

Sources: Status Note on Transport Packaging 28 May 1996, Transportemballage Agreement 1994, Rendan 1996)

^a Solely preliminary recommendations for targets and time-scales, dependent on the November 1996 analysis report prepared by Dansk Industri and Rendan to map actual supply volumes.

^b Currently no available technology for recovery of HDPE, EPS and laminated plastics materials.

^c No targets set for 'Other plastics' in the agreement.

^d Combined figure for mixed paper and board

^e Supply volumes, recycling targets and time limits were not mapped for these materials in the agreement.

^f EPA uses the figure of 56%.

* Approximate volumes or percentage only

**Table 6.5b: Results of the Danish Transport Packaging Agreement:
Progress to Qualitative Targets**

Responsible Party	Action	Targets fulfilled	Details
Municipalities	Extension of existing recycling schemes to include collection and recycling of transport packaging made from plastics, as well as all types of commercial activity that generate transport packaging.	✓/?	Environment Minister reiterated this promise by industry – industry still has to develop fully.
	Collection programmes should be implemented in step with the supply of processing systems.	?	
	Preparation of standard regulations to help municipalities prepare individual regulations for commercial waste (which consider cost- effectiveness of recycling and waste volumes).	✓/?	Currently being prepared.
Municipalities & Recovery & Recycling Industry	Recovery capacity and the market for recovered products must be developed and an increase in recycling achieved by further developing existing waste and recycling schemes and the existing recovery industry.	✓/?	Two pilot projects have been conducted on plastics to establish capacity and technologies, volumes, production, etc.
Dansk Industri	Environment-economic assessments to be carried out prior to any decision on the increased recycling of various materials.	✓/?	Materials Working Groups working on such studies.
Dansk Industri Emballageindustrien Plastindustrien	Promotion of a reduction in the volume of packaging material per unit (no concrete targets set).	?	No overall data provided.
	Trade associations jointly assume the obligation to work towards increasing the recycling capacity of industry to meet targets, especially in plastics, with Dansk Industri assuming an overall obligation to take the necessary initiatives.	✓/?	Minister reiterated that industry should continue to work with municipalities. Current capacity is estimated as sufficient for paper, plastics, Goals to remain as recommendations only while capacity is developed.
	Recycling promoted by packaging size, type and materials selected to optimise re-use and recovery possibilities, with regard to functionality, resource minimisation and environmental impact.	?	
Dansk Industri	Preparation of specifications of fractionated materials for separated collection.	✓	
	Analysis of metal, textile and wood transport packaging supply volumes; concrete targets and time-scales may then be set.	✓	Analysis conducted, Working Group agreed not to set specific goals for these materials as result of analyses, taking existing systems and quantities into consideration.
	Establish Agreement Working Group Secretariat	✓	

Responsible Party	Action	Targets fulfilled	Details
Dansk Industri and Municipalities	Consultation with KL over introduction of waste regulations to require companies to sort waste at source and provision of descriptions and specifications for recyclable materials.	✓	
Plastindustrien	Technology to be developed and made available to achieve targets for other HDPE, EPS and other plastics.	✓/?	Minister agreed to maintain temporary goals for plastics whilst being investigated by Materials Working Groups.
Dansk Industri, Emballageindustrien, Plastindustrien, Kommunernes Landsforening, CO-Industri, Copenhagen and Frederiksberg Kommunes	Set up the Agreement Working Group	✓	Working Group set up and operating. Co-operative aspect with industry, trade and municipalities praised by Minister for positive working together.
Agreement Working Group	Evaluate results of the Agreement and recommend changes and supplements to the contract to the parties in the contract.	✓	
	Evaluate results of analyses, including environmental-economic analyses, in co-operation with industries concerned.	?	
	Register recycled material volumes and prepare annual report for Minister	✓	Initial Report provided in from of Status note in May 1996. First report published November 1996
	Monitor fulfilment of targets and time limits	✓	
	Monitor implementation of municipal regulations on sorting at source	✓	
	Register any unintended environmental effects	?	
	Recommend changes and supplements to the agreement to parties	?	
	Implement development projects to promote recycling of transport packaging waste	?	
Agreement Working Group Secretariat	Solution of administrative tasks relating to agreement	✓	

Note: ✓ Task fulfilled
 ✓/? Task partly fulfilled
 ? Task not fulfilled

6.6.4 Information on the Costs of the Agreement

Few data are available or calculated on the costs of implementing the agreement. Dansk Industri suggests one possible way of calculation is on the basis of a proportion of normal operating costs/wages of the parties involved in the agreement, but this was not done, nor thought necessary. The costs of implementation are spread across the EPA for negotiating and monitoring; Dansk Industri and the trade associations for the Working Group's administration and research; individual companies for sorting and disposal costs; and Municipalities and KL for introducing the necessary schemes and increasing capacity. As the agreement is being implemented through municipal regulations, this makes it complicated to distinguish the effects of the agreement from the effects of the Executive Order and difficult if not impossible to measure the costs of implementing the agreement (Ostergaard; EPA).

København Kommune has carried out an assessment of 'before-and-after costs' for companies in its waste-recycling scheme and this illustrates the effects of a general scheme on industry. A total of 70% of companies noticed no increase in costs/price paid for waste disposal, while 20% reported lower costs and 10% reported higher costs. On the whole, smaller companies, found sorting systems a neutral or positive cost, whereas larger companies found them a positive benefit. These results could also be realistically applied to transport packaging.

The EPA carried out a comparative study of systems for packaging waste in neighbouring countries, particularly the German DSD system, and estimated that implementing the same system in Denmark would be five times as costly as the system in the agreement. The Swedish tax-based producer responsibility system, Belgium eco-taxes and French 'eco-emballage' systems were also seen as more costly on industry and consumers (Arnoldsen, Dansico Pack; Ostergaard, EPA).

6.6.5 Technical Change

There has been a 'low to medium-level impact on innovation', which may be attributed partly to the agreement, particularly in plastics, where the agreement has acted as a spur to the development of technologies for recycling and recovery (Blom; Dansk Industri, Ostergaard; EPA).

6.6.6 Other Impacts

The agreement may have some effects upon the competitiveness of Danish companies at home and abroad. Some minimal negative effects are anticipated as regards imports/exports into and out of the EU, because of the unevenness of the packaging market. However, compared to countries such as Germany and Sweden, industry and the EPA agree that the agreement is conducive to a highly competitive approach (Ostergaard, EPA).

The agreement may 'vaguely' contribute towards eco-labelling, especially of plastics.

In general it is too early to see other impacts and it is seen as very hard to separate this agreement from other factors (Ostergaard, EPA).

6.7 Assessment of Effectiveness

6.7.1 Environmental Assessment

6.7.1.1 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 point of reference. 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 increased. These rough estimates show the need for better data, the production of which is one of the aims of the EA.

6.7.1.2 *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, on the basis of 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% (pending the final conclusions of a pilot project).

6.7.1.3 *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.

6.7.1.4 *Environmental Assessment*

Environmental Effectiveness/Improvement

Since data on the level of pollution in 1995 (which, when the case study was chosen, were expected to be available by June 1996) are still not available, an environmental assessment against the 'business-as-usual' situation or against the reference situation could not be made.

6.7.2 *Assessment Against Wider Impact*

6.7.2.1 *Cost-Effectiveness*

An assessment of cost-effectiveness against another instrument could not be carried out.

However, at least some assessments against systems operating in other countries were made. The agreement is seen by all parties interviewed as being cost-effective. The major aim was to minimise costs for all parties by concentrating on the end-use and collection system and by allowing for choice in terms of sorting, collection and materials selection. It also largely takes into consideration the economic factors involved in recycling and recovery and, so, is based on both commercial and governmental interests. 'We have found a good and cheap way to get a reasonable collection of waste material' (Blom; Dansk Industri; Niklasson, Emballageindustrien).

Cost-effectiveness was measured against a European baseline; the EPA concluded in 1993 that the Danish system was 80% cheaper than the German DSD system,. This was extrapolated to take account of future developments (e.g. plastics recycling technologies). Compared to the Swedish system, also, the agreement was seen to promote more efficient administrative control. Cost effectiveness was also assessed on the basis of the domestic waste baseline; transport packaging waste was selected as the most cost- and environmentally effective waste stream for recycling and as the most effective in terms also of quantities, qualities and cleanliness.

It compared particularly favourably with the costs of previous schemes for recycling/recovering household waste (Ostergaard; EPA, Reis; KL). Cost-effectiveness is also a question of who it is effective for. Industry believes that the agreement is cost neutral overall (Arnoldsen, Danisco Pack), despite having to bear many of the information and research costs.

For municipalities, effectiveness was ascertained on the basis of comparison with alternatives such as the cost of extending recycling and recovery systems, enforcement costs, the degree of central government financing, and the financial system necessary for collection systems and waste fees. Retailers were less certain about the

effectiveness of the agreement, fearing they would bear an unreasonable burden of the costs unless market prices for collected materials were high (Biil, DHS). For the EPA cost-effectiveness was connected with the length of negotiations, which can be compared, in this instance, to the legislative process and, although it is not known if targets will be met faster than if no agreement were signed, it is felt that compliance will be higher and, thus, that implementation could be cost effective. The cost-effectiveness of other policy instruments, such as taxes and legislation, was not considered, as an agreement was seen to be the preferred option (Elmvang, EPA). However, industry in particular was convinced that an agreement was more cost-effective than economic instruments.

6.8 The Future

Agreements are seen very much as a dynamic policy tool which can be revised according to changes in circumstances (e.g. viability of recycling various materials, economic circumstances, changing technologies, increase in data and knowledge, interaction

with parties, interaction with economic markets, etc.). Because of this, there appear to be no plans in Denmark for significant revision of the instrument, although there are doubts regarding the continuing validity of agreements and about inconsistencies between practice and the legislation relating to agreements in S10 in the CEPA 1994, a concern which has been raised by DHS.

6.9. Conclusions

The only monitoring data available date from 1994, the first year of the agreement. These data show 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 significance 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.

6.10 Information Sources

Interviewees

Main signatories:	Industry
Lars Blom, Dansk Industri (Federation of Danish Industries) (I)	Marie Lewis Kauman, Emballage Nævnet (Danish Packaging Council) (T)
Vibeke Ostergaard, Head of Section, Miljøstyrelsen (Danish Environmental Protection Agency) (I)	Jens Christian Sørensen, Packaging & Transport Institute (TNO) (T)
Hannah Miljøstyrelsen (Danish Environmental Protection Agency) (I)	Charlotte Biil, Chief Consultant, Dansk Handel Service (I)
Kurt Bjerre Petersen, Legal Office, Miljøstyrelsen (Danish Environmental Protection Agency) (T)	Jens Arnoldsen, Danisco Pack (T)
Helle Husum, Municipal Office, Miljøstyrelsen (Danish Environmental Protection Agency) (T)	Government & Local Government
Marianne Elmvang, Industry Office, Miljøstyrelsen (Danish Environmental Protection Agency) (I)	Anker Reis, <i>Kommunernes Landsforening</i> (Federation of Danish Municipalities) (I)
Peter Krau, Industry Office, Miljøstyrelsen (Danish Environmental Protection Agency) (T)	Signe Krarup, AKF Institute of Local Government Studies (T)
Helge Anderen, Chief of Waste Department, Miljøstyrelsen (Danish Environmental Protection Agency) (T)	Lars Gårn Hansen, AKF Institute of Local Government Studies (T)
Other signatories:	Sosanna Leenhaard, Konkurrence Rådet (Danish Competition Council) (T)
Jetta Rasmussen, Direktor, Platinidsutrien (T)	Staten Info (State Information) (C)
John Niklasson, Direktor, Emballageindustrien (I)	Helle Poulsen, København Kommune (Municipality of Copenhagen) (T)
Professor Ellen Margrethe Basse, Director, CESAM Centre for Social Science Research on the Environment, Aarhus Universitet (T/C)	Kim Maskell, København Kommune (Municipality of Copenhagen) (T)
Martin Enevoldsen, CESAM Centre for Social Science Research on the Environment, Aarhus Universitet	NGOs
Susse Georg, Copenhagen Business School (T)	Thomas Breck, Forbrugerrådet (Consumer Council) (T)
Hanning Bregusbo, Aarhus University (T)	Jorgen Moltzen, CO-Industri (Central Organisation for Employees) (T)
Consultants	Tarje Haaland, Greenpeace Denmark (T)
Gert Hansen, Rendan (T)	Allan Andersen, Danmarks Naturfredningsforening (Danish Association for Nature Conservation) (T)
Rene Rechtman, KS Consult (T)	(T = Telephone, I = Interview, C = Correspondence)
Daniel Puig, COWI (I)	

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5EAP	5 th Environmental Action Programme
A	All Länder of Germany
ADEME	Agence de l'environnement et de la maîtrise de l'énergie, France
AFNOR	French standard on the design of vehicles to optimise their recycling/ re-use at end of life
AIJ/JI	Activities implemented jointly/Joint Implementation
AIP	Associação Industrial Portuguesa, Association of Portuguese Industries
BAU	Business as Usual
BDI	Bundesverband der Deutschen Industrie, Federal Association of German Industry
BDZ	Bundesverband der Deutschen Ziegelindustrie, Federal Association of German Cement Industry
BGW	Bundesverband der deutschen Gas- und Wasserwirtschaft, Federal Association of German Gas and Water Utilities
BMW	Bayerische Motorenwerke (car manufacturer), Munich/Germany
BOD	Biological Oxygen Demand
CAIMA	Small Portuguese pulp paper producing company
CEC	Commission of the European Communities
CEFIC	European Confederation of Chemical Industry
CELPA	Sector da Pasta de Papel, Portuguese pulp paper association
CEP	Company Environmental Plan, Netherlands
CEPA	Consolidated Environmental Protection Act, Denmark
CFC	Chlorinated Flour-Carbons
CFF	Compagnie Française de la Feraille, French Company operating many shredder sites.
CGS	Centre de Gestion Scientifique, Unit in 'Ecole de Mines', Paris/France
CIREN	Centre International de Recherche sur l'Environnement et le Développement, International Centre for Research on Environment and Development, France
CNPA	Conseil National des Professions de l'Automobile, association of car dismantlers, France
CO	Carbon monoxide
CO ₂	Carbon dioxide
COD	Chemical Oxygen Demand
COP	Conference of the Parties
D	Germany
DCMR	Association of Provinces, Netherlands
DG	Directorate General (of the European Commission)
DGA	Direcção-Geral Do Ambiente, Portuguese Environment Ministry
DGI	Direcção Geral Da Indústria, Portuguese Industry Ministry
DHS	Dansk Handel Service, Danish Trade Service
DIW	Deutsches Institut für Wirtschaftsforschung (German Institute for Economics Research)
DK	Denmark
DOE	Department of Environment, (here: Ireland)
DRIRE	Regional environmental regulator, France
DSD	Duales System Deutschland
DSM	Demand side management
EA	Environmental Agreement
EC	European Commission

ECU	European Currency Unit
EEA	European Environment Agency
EEB	European Environmental Bureau
EIONET	European Environment Information and Observation Network
ELV	End-of-Life Vehicles
EM	Environmental Management Act, Netherlands
EMAS	Environmental Management and Auditing System
EMS	Environmental Management System, Netherlands
en.	Energy
EP	European Parliament
EPA	Environmental Protection Agency, here: Sweden, Denmark
EPS	Expanded polystyrene
ERM	Environmental Resource Management, British Consultant
est.	estimated
ETUC	European Trade Union Confederation
EU	European Union
EURELECTRIC	Grouping of the Electricity Supply Industry
FCCC	Framework Convention on Climate Change
FEDEREC	Fédération Française de la Récupération pour la Gestion Industrielle de l'Environnement et du Recyclage, French Recovery Federation for Industrial Management of the Environment and Recycling
FGD	Flue Gas Desulphurisation
FO	Consultative Group for the Chemical Industry, Netherlands
FoE	Friends of the Earth, environmental NGO, here: Sweden
FR	France
FRF	French Francs
GHG	Greenhouse gas
H ₂ S	Hydrogen Sulphide
HDPE	High-density polyethylene
ICCA	International Council of Chemicals Associations
IEA	International Energy Agency, Paris/France
IETP	Integrated Environmental Target Plan, Netherlands
ifo	Institut für Wirtschaftsforschung, Institute for Economics Research, Munich/Germany
IPPC	Integrated Pollution Prevention Control
ISO	International Organisation for Standardisation
ITOT	International Environment Technology Transfer Centre, Leipzig/Germany
KL	Kommunernes Landsforening, National Association of Local Authorities, Denmark
KPMG	International Consultant Group
LDPE	Low-density polyethylene
MEP	Member of Parliament
MSW	Municipal Solid Waste
MWV	Mineralölwirtschaftsverband, Oil Refining Industry, Germany
MYA	Multi-year agreement
N	New Länder, former part of East-Germany
NEPP	National Environmental Policy Plan, Netherlands
NFP	National Focal Point (of the EEA)
NFR	Swedish Packaging Council
NGO	Non-Governmental Organisation (here mainly used for environmental ones)
NL	Netherlands

NM ³	normal cubic meter
NO _x	Nitrogen oxides
O	Old Länder, former part of West-Germany
OECD	Organisation for Economic Co-operation and Development, Paris
P	Portugal
P&P	Pulp Paper
PAH	Polycyclic (or polynuclear) aromatic hydrocarbons
PARCOM	Convention for the Prevention of Maritime Pollution from Land Based Sources (Paris Convention)
PCB	Polychlorobiphenyls
PEDIP	Specific Programme for Development of Portuguese Industry
Perf.	Performance
Pers. Comm.	Personal Communication
PET	Polyethylene terephthalate
PORTARIA	Portuguese law on water/effluent and air emissions of pulp paper industry
PORTUCEL	Large Portuguese pulp paper producing company
PP	Polypropylene
prod.	Production
PRTR	Pollutant Release and Transfer Register
PSA	French car company with the two constituent companies Peugeot and Citroën
PTE	Portuguese Escudos
PVC	Polyvinylchlorine
PWS	Priority Waste Streams
R&D	Research and Development
red'n	Reduction
Ref.	Reference
REPA	Repapregistret, Swedish Packaging Collection Scheme
RES	Renewable Energy Sources
RUE	Rational Use of Energy
RWE	Rheinisch-Westfälisches Elektrizitätswerk, Utility company, Germany
RWI	Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Rhine-Westphalian Economics Research Institute, Germany
S	Sweden/Sulphur
SEARN	Secretarias de Estado do Ambiente e dos Recursos Naturais
SEI	Secretarias de Estado da Industria
SEK	Swedish Kronas
SME	Small and Medium-sized Enterprises
SNM	Stichting Natuur en Milieu, Dutch Environmental NGO
SO ₂	Sulphur dioxide
SOPORCEL	Large Portuguese pulp paper producing company
sp.	Specific
SPMP	Syndicat des Producteurs de Matières Plastiques, Association of plastic manufacturers, France
STORA	Medium Portuguese pulp paper producing company
TEU	Treaty on European Union
tot.	total
TSS	Total Suspended Solids
UK	United Kingdom
UNCED	United Nations Conference on Environment and Development

UNICE	Union of Industrial and Employers' Confederation of Europe
VA	Voluntary Agreements
VCI	Verband der Chemischen Industrie, Association of Chemical Industry, Germany
VDEW	Vereinigung Deutscher Elektrizitätswerke, Association of German electricity supply companies
VDZ	Verein Deutscher Zementwerke, Association of German cement companies
VIK	Verband der Industriellen Energie- und Kraftwirtschaft, Federation of Industrial Energy Consumer and Self-Producers, Germany
VKU	Verband kommunaler Unternehmen, Association of Municipal Enterprises, Germany
VNCI	Dutch Chemical Industries Associations
VNONCW	Confederation of the Netherlands' Industry and Employers
VROM	Dutch Ministry of Housing, Spatial Planning and the Environment
WWT	Waste Water Treatment
yr	year
ZEW	Zentrum für Europäische Wirtschaftsforschung, Centre for European Economics Research, Mannheim/Germany
ZVEI	Zentralverband der Elektro-Industrie, Association of the Household Appliances Industries, Germany
