Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

22-Oct-2003

English text only

ENVIRONMENT DIRECTORATE
ENVIRONMENT POLICY COMMITTEE

ENV/EPOC/WPNEP(2003)10/PART1/FINAL
Unclassified

Working Party on National Environmental Policy

PROCEEDINGS OF OECD SEMINAR ON EXTENDED PRODUCER RESPONSIBILITY: EPR PROGRAMME IMPLEMENTATION AND ASSESSMENT

PART 1: TAKING STOCK OF OPERATING EPR PROGRAMMES

OECD, 13-14 December 2001

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JT00152068

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FOREWORD

The OECD held a seminar on Extended Producer Responsibility Programme Implementation and Assessment, from 13-14 December, 2001. The main purpose of the seminar was to examine how governments are implementing EPR policies and to discuss their results achieved. The seminar created a forum for member governments to share information about their EPR programmes, discuss pressing issues and to explore ways to implement sounder and more effective EPR policies.

The seminar was divided into four sessions: two sessions consisted of panel presentations from member governments, academia, industry and other experts and two sessions comprised discussion of two consultants' papers with discussants. Over 50 participants attended the seminar, representing government, industry, academia and non-governmental organisations. The outcome of session discussions and recommendations gave OECD clear directions on where to focus its future EPR activities. In particular, participants stressed the need for further guidance on economics of EPR as well as the need for empirical data on the costs and effectiveness of EPR so as to allow for more conclusive policy and programme analysis.

The Proceedings of this seminar are divided into two parts: Part One consists of papers from Sessions 1 and 2. Part Two contains papers from Sessions 3 and 4. The Proceedings contain only papers submitted to the seminar; no presentations are included.

The opinions expressed in these proceedings are those of the authors, and do not necessarily reflect the views of individual member countries. The document is published under the responsibility of the Secretary General.

TABLE OF CONTENTS: PART 1

EXECUTIVE SUMMARY 7

SESSION 1: TAKING STOCK: A LOOK AT OPERATING EPR PROGRAMMES 15

EXTENDED PRODUCER RESPONSIBILITY IN THE NETHERLANDS *by Kees Veerman* 16

RESOURCES IN RETURN:
A REVIEW OF SWEDEN'S EPR PROGRAMMES *by Anita Linell* 17

PRODUCT STEWARDSHIP INITIATIVES IN THE UNITED STATES:
A NATIONAL AGREEMENT FOR CARPET *by Garth Hickle and Catherine A. Wilt* 28

AGREEMENTS ON THE REDUCTION, COLLECTION AND RECOVERY
OF PACKAGING WASTE IN NORWAY *by Knut Krøepelien* 43

IMPLEMENTATION OF EPR IN NORWAY – THE CASE OF PLASTIC PACKAGING
AT NATIONAL, SECTORAL AND COMPANY LEVEL *by Kjetil Roine and Helge Brattebo* 52

EXTENDED PRODUCER RESPONSIBILITY AS AN INSTRUMENT
TO REDUCE PACKAGING WASTE: THE GERMAN EXPERIENCE *by Thomas Schmid* 76

DISCUSSANT COMMENTARY ON PAPERS FROM SESSION 1 *by Reid Lifset* 80

EPR PROGRAMME SUMMARIES SUBMITTED BY GOVERNMENTS 84

TABLE OF CONTENTS : PART 2

[The Table of Contents for Part 2 of this two volume set is included here for information only.]

FOREWORD 145

SESSION 2: ASSESSMENT AND EVALUATION OF EPR POLICIES AND PROGRAMMES 149

EVALUATING THE ENVIRONMENTAL EFFECTIVENESS AND ECONOMIC EFFICIENCY OF EXTENDED PRODUCER RESPONSIBILITY (EPR) *by Michael Sturges* 150

DISCUSSANT COMMENTARY *by Margaret Walls* 212

DISCUSSANT COMMENTARY *by Thomas Eichner* 214

SESSION 3: EPR PROGRAMME IMPLEMENTATION: INSTITUTIONAL AND STRUCTURAL FACTORS 225

EPR PROGRAMME IMPLEMENTATION: INSTITUTIONAL AND STRUCTURAL FACTORS *by Naoko Tojo and Thomas Lindhqvist* 226

DISCUSSANT COMMENTARY *by Pieter van Beukering* 276

SESSION 4: INTEGRATED PRODUCT POLICY (IPP) AND EXTENDED PRODUCER RESPONSIBILITY (EPR) 285

INTEGRATED PRODUCT POLICY AND EXTENDED PRODUCER RESPONSIBILITY *by Claudia Fénérol* 286

INTEGRATED PRODUCT POLICY AND EXTENDED PRODUCER RESPONSIBILITY *by Jacques Desarnauts* 290

PRINCIPLES OF IPP AND EPR: THE PERSPECTIVE OF A GLOBAL CONSUMER GOODS COMPANY *by Marina Franke* 292

DISCUSSANT COMMENTARY *By Bette Fishbein* 295

EXECUTIVE SUMMARY

1. Introduction and background

Governments are looking for new ways to reduce waste and to provide better incentives to producers to create products that are more environmentally compatible. One environmental policy tool being used more and more by member countries to address these issues is Extended Producer Responsibility (EPR). Current trends indicate an expansion in the application of EPR inside and outside the OECD and a widening in the range of targeted products. In 1994, the OECD began a three-phase project to examine the context of EPR and provide guidance to governments wishing to implement EPR programmes and policies. The EPR Guidance Manual for Governments was published in 2001.

Since OECD began its work on EPR, almost every country has implemented one or more EPR programmes. These programmes vary considerably, resulting from a number of factors; principally from the difference in the products or waste streams covered, instruments (instrument mix) used, to how responsibility physical and financial is allocated to the producer. Therefore, it was timely to hold a seminar to take stock of existing programmes, their implementation and to try to gather information about their costs and results achieved across OECD countries. Such information would help governments to better understand the patterns and trends in EPR implementation and the variation in costs and effectiveness between programmes, which in turn will help governments to design and develop more effective EPR policies.

What is EPR?

EPR is a policy in which the producer's financial and/or physical responsibility for a product is extended to the post-consumer stage of the product's life cycle. It specifically focuses on reducing the environmental impacts of a product at the post-consumer phase. There are two key features to an EPR policy: i) the responsibility for a product at its post consumption phase is shifted upstream in the production-consumption chain, to the producer, and ii) it provides incentives to producers to incorporate environmental considerations into the design of their products.

2. Seminar

Following the completion of the Guidance Manual, work on EPR has shifted in context to focus on practical implementation issues. To this end, a seminar on EPR Programme Assessment and Implementation was held in Paris, from 13 to 14 December 2001 to provide OECD governments a forum to share information and experiences in the implementation of EPR programmes, discuss pressing issues and to describe their results achieved. Each session was designed to address a particular aspect of EPR programme implementation and assessment.

The seminar was divided into four sessions: two sessions consisted of the presentation of consultant's papers with discussants and two sessions involved panel presentations by representatives form member governments, industry, non-governmental organisations and academia.

The outcome of the discussions, and subsequent recommendations, gave OECD clear directions on where to focus its future EPR activities. In particular, participants stressed the need further guidance and recommendations for analysing the economics of EPR and its implementing instruments as well as the need for empirical data on the costs and effectiveness of EPR to conduct better and more conclusive analysis. In response to these findings, OECD has initiated new work on the economics of EPR.

2.1 Objectives

The objectives of the seminar were to:

- identify the range of existing (and emerging) EPR programmes, costs and results achieved;
- share practical experience and lessons learned through the implementation of EPR policy and programmes;
- examine the structural and institutional factors affecting the implementation of EPR programmes; and
- consider the role of EPR under the concept of Integrated Product Policy (IPP).

2.2 Summary of sessions

2.2.1 Session 1: Taking stock: a look at operating EPR programmes

Session 1 consisted of several presentations by member countries on their EPR programmes and results to date. This session set the background to the seminar, providing comprehensive descriptions of implemented programmes and their results achieved.

Expansion of EPR

An important theme that emerged from this session is that the type and number of EPR programmes being implemented is increasing rapidly, and different policy instruments are being used to address a variety of products, product groups and waste streams. One current trend in the application of EPR is to electronic and electrical equipment. The key driver in the application of EPR to electronic and electrical equipment is the organisation of the collection, sorting, recycling and reuse of the products to reduce their impact on the environment. The size, volume, life span and complexity of materials found in these products at their post-consumption stage make them apparent candidates for EPR policy.

Examples of results achieved

Several participants presented details of reviews carried out on EPR programmes implemented in their country. The Netherlands found that EPR has been most effective in increasing collection and recycling rates. EPR programmes have also helped augment the development of new technology and in raising resources needed for the sorting and recycling of products.

Germany described the positive success it has had in the implementation of their packaging ordinance. Over time, packaging has decreased around 3% per year, despite forecasts that packaging use would rise at about 2-4% per year. The recycling capacity for packaging was 20 000 tons in 1991, when the ordinance was passed, and it increased to over 500 000 tons by 1996. There are two primary reasons why the approach taken in Germany has achieved positive results: (i) product fees are assessed up front and are differentiated by weight and type of material based on costs for collecting sorting and recycling; and (ii) the high recycling targets drive innovation and change in products to be lighter and easier to recycle, thus lowering costs to the producer. The key barriers identified in the German packaging programme have been free riders and improper disposal by consumers (*i.e.* placing non-packaging items in the collection bins). Both issues have caused the administration costs to increase.

Norway has a voluntary agreement for plastic packaging, beverage cartons, brown paper, and folded cartons with recycling targets. After five years of implementation, they have found that the agreements on packaging waste have been an effective means of achieving high collection and recovery levels for packaging waste. The targets set in the agreement for brown paper was achieved and good progress has been made in achieving the targets for the other materials. For example, the collection and recycling targets for plastic packaging of 30% material recycling and 50% of energy recovery have not yet been met. However, in 2001 material recycling was at 22%, energy recovery was at 57 %. An important point raised at the seminar was that from 1995-2000, there was an 18% reduction in total plastic packaging used in Norway, while over the same time period, there was an increase of 16.2% in packaging consumption. The increased plastic material recycling is attributed to Norway's producer responsibility programmes.

A social cost benefit analysis by the Norwegian Ministry of Environment found that the management efficiency of the agreements has been high and that the agreements have been cost effective. The study also indicated that it was possible to achieve a high level of dynamic efficiency with the agreements.

Recently, the Japanese EPR programme for household appliances went into effect. Early analysis of their programme indicate that it has stimulated competition between firms to lower their costs for end-of-life recycling in hopes of reducing the fee that a consumer must pay at the end of the product's' life to gain greater market share. Fees charged are from 500-2500 JPY (about 4.50 to 21.50 €) per item collected and 2400-4600 (about 21-40 €) for the recycling fee.

Scope of EPR

Another point raised in this session was the application and scope of EPR policy. Discussions centred on whether EPR should be considered as an environmentally effective waste policy or if it also influences waste prevention and resource efficiency actions. While the general position of seminar participants is that EPR does send clear signals upstream to the producer to take environmental considerations into the design (or re-design) of their products, there was some disagreement. One participant, while a strong advocate for EPR, noted that EPR fills a gap in the production-consumption chain of for efficient and effective collection, sorting, reuse and recycling, but they have not found evidence that it promotes upstream changes in materials used or product design. Participants agreed that further research is needed on how EPR programmes affect the production-consumption chain.

2.2.2 Session 2: Assessment and Evaluation of EPR Policies and Programmes

Session 2 addressed the general question of the assessment and evaluation of EPR policies in terms of their environmental effectiveness and economic efficiency. Discussions focused primarily on the particular methodology that should be used to evaluate its effectiveness and efficiency.

Cost-effectiveness study

It was generally agreed that a cost effectiveness study, focusing on the life cycle of a product, would be the preferred approach for evaluating EPR. However, it was noted that the complexity of EPR programmes (allocation of responsibility, actors involved in programmes, different products and markets, *etc.*) necessitate the development of more tailored analytical methods so as to capture the benefits and to quantify applicable costs. An important conclusion from the session was that there still *lacks basic data and information on the operation and results* of EPR policies and programmes to make appropriate determinations on their efficiency and effectiveness. The lack of data is two-fold stemming from the recent implementation of programmes and the lack of built-in monitoring methods and measures.

While this session focussed on the methodologies to be used for assessing the performance of EPR programmes, participants raised the issue of distributive effects of EPR programmes, and they requested further clarity from OECD on which costs should be included in an evaluation of EPR (*e.g.* do we include costs to households). Given that the evaluation of EPR policy is in its infancy, it was requested that more precise guidelines be developed on type of costs to include in an EPR policy evaluation. It was pointed out that some benefits that are less readily quantifiable (such as, improved environmental space, reduction in litter, or less toxic chemicals being deposited in landfills) need to be included in any cost effectiveness evaluation. Participants also emphasised that net costs and net benefits across the product chain should be included in any evaluation.

Market-failure of product re-design

A salient point from this session concerns the market failure for product re-design *i.e.* the lack of price signals for a producer to change their product characteristics to be more environmentally compatible or to promote more recycling and re-use. Again, the issue was raised on how much EPR influences upstream changes in the producer's behaviour. One of the session's discussants emphasised that EPR can be designed to correct this failure.

To make a more conclusive judgement on this point, more empirical data are needed. When appropriate data are collected, the policy objectives and operational targets of EPR policies would need to be examined to determine if (and how) they need to be changed or re-focused to drive more upstream changes in the product.

2.2.3 Session 3: EPR programme implementation: institutional and structural factors

The aim of session 3 was to identify institutional and structural factors that arise during the implementation and operation of EPR programmes. Discussions tended to focus primarily on how the type of product (and its characteristics) and the market structure (*e.g.* the number of producers and importers, size of market, distribution network, *etc.*) affect implementation. Large, widely dispersed distribution networks will affect the co-ordination and functioning of a programme. One solution for products such as packaging (short life products with many producers) is to form a collective organisation such as a producer responsibility organisation. An important point raised was that issues such as free-riding are reduced in systems where there are a limited number of producers and importers. A good example of a product with a small number of producers is refrigerant. In response to the Montreal Protocol and its phase out schedule for CFCs, several refrigerant reclaim programmes have been formed in different OECD countries. There are only a handful of producers and importers. In such cases, peer pressure would generally ensure participation in the programme.

Participants agreed that the current infrastructure for collection, sorting and recycling should be used, to the greatest extent possible so as to minimise additional administrative and transactions costs. Also, factors such as differing costs for wastes and local land value (cost of landfilling) will affect the implementation and participation in an EPR programme.

Transparency

Transparency - from design to implementation - was stressed as a crucial aspect of EPR. Actors across the production-consumption chain - producers to the consumers - need to be cognisant of, and informed about, EPR policy development and programme implementation. Moreover, the type of information (for instance, labels, brochures, posters at retailers that is systematically disseminated) and the manner in which it is provided to actors along the chain (especially the consumer), will strongly affect the success of the system, emphasising the need for a good information dissemination plan integrated at the policy design phase. Additionally, the pricing signal, coupled with well-designed information strategies, play a paramount role in the implementation of EPR.

Voluntary approaches

Voluntary approaches were raised as a viable EPR policy option in certain cases. Preliminary evidence indicates that voluntary programmes are best suited for products that have a higher end-of life value. The end of life value would be the motivating factor for the producer to take action to recover or reuse the product. However, several participants pointed out that, mandatory take back, and other economic instruments would provide better incentives for more upstream changes to product. Many workshop participants were in the opinion that voluntary approaches can play a significant role across the economy, but the drivers, costs and results of these programmes need to be examined in relation to those found in mandatory programmes.

2.2.4 Session 4: Integrated product policy and EPR

The role of EPR under the emerging concept of integrated product policy (IPP) was discussed under Session 4. Discussions following the panel presentations concentrated on how EPR policy supports the objectives of IPP. IPP is an umbrella concept, covering a range of policies that target different parts of a product's life cycle, and seeks to reduce the life cycle impacts of products from resource extraction, production, distribution, use, and waste management. With EPR, the policy intervention is directed at the product's post-consumer phase to reduce the volume of waste and to augment collection and sorting efforts, thus (theoretically) sending signals upstream to influence product design to be more environmentally compatible. In light of this, participants agreed that EPR is a policy that can be used to help meet the objectives of IPP and to, as appropriate, design EPR policies and programmes in a way to help advance the objectives of IPP.

3. Conclusions and recommendations

While most member countries have implemented an EPR programme, and are expanding its application to new products, product groups and waste streams, assessing the implementation of EPR is a relatively recent activity. This is mostly due to the short time frame these programmes have been operating and the fact that relatively few programmes have built in monitoring mechanisms and criteria for assessing and evaluating performance. The apparent lack of data on policy and programme performance is linked to the short operational time of programmes and the lack of built in monitoring mechanisms.

One of the important outputs from the seminar is that it provided a forum to bring together some of the salient issues in the implementation of EPR and provided a mechanism for governments, industry and on governmental organisation representatives to identify what is needed to implement more efficient and effective policies. The key conclusions and recommendations are the following:

- The seminar pointed out the need for more empirical data and <u>further analysis on the economics of EPR</u>, principally the development of an analytical framework for assessing

more precisely the costs and benefits. In addition, the conditions under which EPR should be applied over another waste management instrument warrants further examination so as to provide Member governments with advice on when EPR might be the more cost-effective policy to use to address specific environmental impacts.

- There is a broad range of EPR programmes implemented at different levels within a country and regionally. This trend is expected to continue. Advice on a more strategic approach to EPR at the national and international level could be warranted.

- The issue of the scope of EPR was raised with respect to whether EPR is simply a waste management policy or if the policy extends upstream to prevent pollution and increase resource efficiency. The lack of specific data and information on the *actual* effects of EPR on the production-consumption chain (and how to decipher these effects from those of other factors) hinders any definitive conclusions. The seminar revealed the need for further examination of the *real* scope of EPR (or how the scope can be extended) in relation to the policy objectives, the implementing instrument used and other factors such as targets, economic activity, consumption patterns, and so forth.

- The financing mechanism of the EPR programme can affect its performance (*i.e.* the effect on technical innovation). Further examination and guidance should be given on where to place the financing mechanism and at what level the price signal should be set.

- What effect does EPR have on innovation? Participants noted that further exploration on whether EPR promotes or hinders innovation and the take up of new technologies should be undertaken.

- Additional work is needed on trade and competition effects of the different EPR policy instruments as they are applied to new products and product groups (*e.g.* electronics and electrical appliances). While trade was raised in conjunction with competition, the potential issues with competition would be of priority concern.

- EPR is one tool among others and its application should always be assessed in the context of policy mixes. A number of factors should be taken into account when applying EPR policy, for instance, the characteristics of the targeted products, product categories or waste stream, market structure and power, costs of waste disposal and risk of product at its post consumer stage, to name a few. Thus, setting objectives, designing the policy and programme and any cost and effectiveness studies should be carried out with a view of the varying policy and programme elements that are specific to the concept of EPR.

In the future, the OECD and/or member countries, individually or jointly, could undertake the research and analysis noted above to add to the knowledge base on EPR, helping member countries to create policies and programmes that would better address the environmental impacts from products at their post-consumer phase, and to redefine policies, as appropriate, to make them more cost-effective.

AGENDA

EXTENDED PRODUCER RESPONSIBILITY
PROGRAMME IMPLEMENTATION AND ASSESSMENT

13-14 December, 2001
Paris

THURSDAY, 13 DECEMBER, 2001

09h30-09h40 ***Welcome: Robin Wilson, Chairman***

SESSION 1 - TAKING STOCK: A LOOK AT OPERATING EPR PROGRAMMES

Most Member governments have initiated an EPR programme at the national or sub-national level. The *objective* of this session will be to examine operating EPR programmes and their results. The session will focus on several issues, such as: the type of policy instrument used to implement EPR; the scope of the policy in terms of products, product categories or waste streams; and, the nature of responsibility for different actors in the product chain. A principal *aim* of this session will be to develop a kind of taxonomy of EPR programmes based on the type policy instrument, programme design and components.

09h40-13h00

Panel presentations on national programmes*:*

- *Kees Veerman, VROM, Netherlands*
- *Kazuyoshi Okazawa, Ministry of Environment, Japan*
- *Anita Linell, Ministry of Environment, Sweden*

11h00-11h30 Break

- *Garth Hickle, Minnesota Office of Environmental Assistance, USA*
- *Kjetil Roine, Norway*
- *Thomas Schmid, Ministry of Environment, Germany*
- *Reid Lifset,Yale University, will be the discussant*

13h00-15h00 Lunch

SESSION 2 - ASSESSMENT AND EVALUATION OF EPR POLICIES AND PROGRAMMES

This session will focus on the economic efficiency and environmental effectiveness of EPR. Following on from the previous session, the *objective* of this session will be to identify the conditions (e.g. product choice, market structure, number of producers, distribution chain, instrument choice, etc.) under which EPR is likely to be an effective and efficient environmental policy instrument.

15h00-18h00

Paper presentation with discussant:

- *Michael Sturges will present a paper on Evaluating the Environmental Effectiveness and Economic Efficiency of Extended Producer Responsibility.*
- *Margaret Walls, Resources for the Future, USA, will be a discussant*
- *Thomas Eichner, University of Siegen, Germany, will be a discussant*

16h00-16h30 Break

FRIDAY, 14 DECEMBER 2001

SESSION 3 EPR PROGRAMME IMPLEMENTATION: INSTITUTIONAL AND STRUCTURAL FACTORS

The *aim* of this session is to build on the experience of countries in addressing particular institutional and structural issues that arise during the implementation and operation of an EPR programme. For example, what are the means used to avoid the potential for free riding or collusion in EPR programmes implemented at the sectoral level? It will also address issues associated with the treatment of orphan and existing products under EPR programmes and other structures (e.g. Producer Responsibility Organisations). Finally, factors surrounding the distribution of information, responsibility of producers, co-ordination within the product chain for the collection of products and their effect on EPR programme implementation, will be discussed.

09h30-12h30

Paper presentation with discussant:

- *Naoko Tojo and Thomas Lindqvist, LUND University and Gary Davis, Clean Technology Center; will present a paper on institutional and structural factors.*
- *Pieter Van Beukering, Free University, Amsterdam, will be the discussant*

12H30-14H30 LUNCH

SESSION 4 - INTEGRATED PRODUCT POLICY AND EPR

Integrated Product Policy (IPP) is an emerging concept in Europe and in other regions of the OECD. As this concept is being discussed more and more in the context of product policy, the questions to be answered are what is the role of EPR and how can EPR help meet the objectives of IPP. The *objective* of this session is to discuss the current working definition of IPP and, based on this definition, identify what is the role of EPR under IPP. An issues paper will be prepared by the OECD Secretariat.

14h30-17h30

Panel presentations with discussant:

- *Jacques Desarnauts, Atofina, France*
- *Otto Linher, European Commission*
- *Marina Franke, Proctor & Gamble Services, Germany*
- *Bette Fishbein, Inform Inc., will be the discussant.*

15H45-16H15 BREAK

SESSION 5 – SUMMARY

The chairman will summarise key points from the seminar and discuss next steps.

17h30-18h00

- Chairman's summary of seminar
- Next steps

The meeting will adjourn at 18h00.

SESSION 1: TAKING STOCK: A LOOK AT OPERATING EPR PROGRAMMES

EXTENDED PRODUCER RESPONSIBILITY IN THE NETHERLANDS

by
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The Netherlands

Summary

The Netherlands has more than 10 years experience with EPR. Voluntary systems have been developed, like with plastic (PVC) tubes, End of Life Vehicles, float glass, PVC window frames. They mandated systems like with batteries, car tyres, packaging, agricultural plastic films and waste electric and electronic equipment.

Propositions, based on this experience:

1. Use EPR when the recycling of a product costs money (has a chain deficit). By making producers responsible for this deficit, you get the recycling financed.
2. Use EPR when managing the whole chain is necessary for getting separate collection and/or recycling of a product started in a useful manner. EPR leads to a greater efficiency of waste management of products. Results as with end of life vehicles (EOLV), batteries, packaging and waste electrical and electronic equipment (WEEE) would not have been there.
3. Do not try to stimulate prevention or design for recycling with EPR, (especially not with products with a long lifecycle):
   - differentiation of recycling costs per product / brand is difficult;
   - administrative costs of differentiation are high;
   - environmental burden of a product during lifetime is far the most in using it, not in the waste stage. Use energy consumption as a differentiation instrument.
4. When introducing EPR, make it for producers easy to tackle the (financial) problem of historical waste as well of the orphans. An Advance Disposal Fee, possibly externalised, makes the introduction of EPR much easier.
5. Consumer pays the costs of EPR.
6. To prevent evasive behaviour, make producers responsible for the whole waste-chain or make everybody's responsibility clear.
7. To prevent leakages, the last owner should have the possibility to discard at least for zero. Also collectors should have this possibility in discarding to the producers system.
8. Collective systems of producers should be promoted: cheaper, approachable for industries as well for the government, better environmental results.
9. Promoting collective systems by supporting legislation (making voluntary agreements generally binding), by stimulating it in legislation and by strong enforcement of free riders.

RESOURCES IN RETURN: A REVIEW OF SWEDEN'S EPR PROGRAMMES

Summary of the Report from the Commission to Review Producer Responsibility

by
Anita Linell
Ministry of Environment
Sweden

I. Introduction

The following paper summarises the main outcome from an extensive study undertaken by the Commission to Review Producer Responsibility for the Swedish Ministry of Environment to evaluate the environmental effectiveness and economic efficiency of EPR programmes in Sweden.

II. Summary of the Commission's Report

1. Terms of reference

The terms of reference for the study consisted of several parts. Primarily, they were to evaluate of existing producer responsibility programmes for packaging, tyres and waste paper, the systems for returnable beverage containers, the voluntary measures for office paper and the construction sector, and to make recommendations for improvements. The terms of reference also instructed the Commission to consider whether the statutory producer responsibility should be extended to additional groups of products. The terms required the Commission to investigate and make proposals on financial guarantees for compliance with producer responsibility.

2. Starting points

The evaluation and recommendations are based on the environmental policy objectives for producer responsibility. The aims of producer responsibility in Sweden are to:

- reduce the quantity of waste sent to landfills;
- reduce the environmental impact on by resource-efficient use of materials and energy during the life cycle of the product;
- reduce the use of hazardous chemical substances;
- reduce litter.

Other important bases for the evaluation and recommendations of the Commission are the roles of the participants in the programme, the efficiency of the systems, socio-economic effects and aspects relating to competition, such as, for instance, problems with non-compliance and monopolistic tendencies.

3. Result of the evaluation

The following criteria were used for the Commission's evaluation: recycling targets, environmental policy objectives; socio-economic effects; the role of the participants and the efficiency of the systems; competition; and links to other means of control.

Recycling targets. The assessment showed that the recycling targets for the statutory producer responsibility, returnable beverage containers and the voluntary measures were satisfactorily achieved in most cases. Areas where the targets have not been attained include certain kinds of packaging and the voluntary undertakings of the construction sector.

Environmental policy objectives. The main environmental policy objectives for producer responsibility have been achieved, *i.e.* reduced quantities to landfills and resource-efficient use of material and energy. Life cycle analyses shows that landfilling is the worst alternative from an environmental point of view. Material recovery is preferable to use as a source of energy. In certain cases, the environmental differences between material recovery and use as a source of energy are small, for instance, in the case of paper packaging. Producer responsibility has led to a reduced use of hazardous chemical substances although other legislation has also been a very important factor here. The deposit-refund system for beverage containers has contributed to reduced litter.

Socio-economic effects. The evaluation shows that the current levels of recycling are socio-economically defensible. However, any future changes of the level of objectives must be assessed on the basis of new socio-economic analyses.

The role of the participants and the efficiency of the systems. Problems that exist in the systems are often related to lack of clarity about the role of the participants which in turn has a negative effect on collaboration. The systems for collection from households are relatively new and need to be further developed, for instance, to make it easier for consumers. Producer responsibility has been developed in stages for different groups of products. In the future, a more holistic concept is required on how the systems are related to each other and that they would have a stronger focus on the consumer as an important link in the producer responsibility chain.

Competition. The statutory producer responsibility has given rise both to monopoly tendencies and problems with non-compliance, *i.e.* producers who do not take their responsibility. Other problems are insufficient supervision and monitoring.

In summary, the existing producer responsibility is both environmentally and socio-economically justified. It should therefore continue to apply substantially in its present form. Since the systems have not existed for such a long period, there are in my view many untried solutions to test to overcome the problems related to competition, the roles of participants and collaboration and the efficiency of the systems.

Link to other means of control. The ordinances on statutory producer responsibility are dependent on other means of control to function well. Those affected must receive information about how the systems work and why they have been introduced. These ordinances also need to be combined with financial means of control that serve as driving forces for increased recycling, *e.g.* a tax on waste sent to landfills.

It may be an advantage to let legislation on producer responsibility be preceded by voluntary undertakings to gain time to learn more about how the systems work as regards competition, the economy and practical issues. This may also result in voluntary undertaking working so well that legislation is not required.

4. Future

Based on the current assessment of the programmes, in 2010, it is expected that there will be a flourishing recycling market. Progress has mainly been made by extensive voluntary undertakings in the business sector in a dialogue with and working together with the state. Producers will think in a life-cycle perspective when products are designed. The end-of-life products are processed on the basis of functioning markets. To date a variety of new technical solutions for sorting and recycling of various kinds of material have been developed and it is expected to continue. The logistic systems for producer responsibility already created will be built up in collaboration with producers, municipalities, property owners, trade, recyclers and others concerned. The consumer will be an important focus and viewed as an important link in the chain of producer responsibility.

In 2010, it is envisaged that waste is a resource and not a residue problem.

5. Recommendations on expanded statutory producer responsibility and voluntary undertakings

Considerations on expanded producer responsibility are based on a number of case studies of some interesting groups of products. Each product group is listed in sub-sections below. The product groups differ, for instance, due to the environmental impact and in the phase of the products' life cycle in which the environmental impact arises. The selection of product groups has been made on the basis of a newly made compilation of expertise, "The environmental impact of different groups of products", but also on the basis of the wishes of different participants.

The construction sector. There are many reasons that argue in favour of a statutory producer responsibility in the construction sector. Some of the most important of these are the large quantity of material and goods that are produced annually and handled by the industry, at the same as large quantities of waste are generated. Another reason for introducing producer responsibility is to obtain better control of the chemicals that building materials may contain. Furthermore, there is a great potential, to economise with resources in the form of energy and materials in the industry through recycling and material recovery. This type of economical use has recently started and a lot remains to be done. It is also a large, complex sector where it can be difficult to get through with the message about voluntary undertakings to all participants.

The construction industry's Ecocycle Council has presented a new action plan to the commission of enquiry. It is considerably better designed than the first action plan which was concluded in 2000. The objectives are measurable both as regards when the undertaking is to be completed by and what is to be achieved by that date. Moreover, there is a description of the way in which the objectives are to be achieved and how they are to be monitored. In my assessment, the construction sector should have good prerequisites to comply with the new action plan.

Despite there being a lot in favour of a statutory producer responsibility for the construction sector, my assessment is that the work with voluntary undertakings should continue for a few more years. The reason for this is that the sector has presented a new action plan which makes a credible impression.

Heavy vehicles. I note that a very large proportion of end-of-life heavy vehicles are taken care of already since there is an efficient market for spare parts and material recovery. Moreover, a lot of the second-hand vehicles are exported for continued use in other countries. A new regulatory framework comes into effect on 1 January 2002, and a ban on landfilling of unsorted combustible waste will be introduced. Moreover a new classification of hazardous waste is being introduced. This will increase the demands on how end-of-life heavy vehicles are to be taken care of. In my assessment, therefore, there are no reasons to introduce a statutory producer responsibility.

Impregnated timber. Impregnated timber needs to be taken care of according to existing rules. Opportunities exist for re-use of for instance posts and sleepers by cutting off damaged parts of the wood. One problem is the large number of users, both large and small. The lifetime can be 30 years or more, which further complicates the situation as regards responsibility. In my assessment, producers should take increased responsibility although a statutory producer responsibility is not currently under consideration.

Lead batteries. Lead batteries are already subject to legislation in the form of the Batteries Ordinance. The taking care of and recycling of batteries is working well. The problem of poor prerequisites to create a long-term approach in planning activities can be solved by changed agreements between Returbatt AB and the Environmental Protection Agency. In my assessment therefore, there is no reason to propose new legislation in the form of a statutory producer responsibility.

Furniture. The flows of material that are created in conjunction with the use of furniture are relatively large in a national perspective. Further measures are required as regards reduced use of chemicals. There is a good potential for increased material recovery. Due to some furniture having a lifetime of a hundred years or more, it is not self-evident how financial guarantees can be created for taking care of them. My assessment is that producers should assume greater responsibility in the furniture industry although the time is not ripe for statutory producer responsibility.

Toys. The quantity of materials used in toys and the quantity of waste that arises are small in relation, for instance, to the construction industry and the furniture industry. Some toys are covered by producer responsibility for electrical and electronic waste. Toys are sometimes handed down from generation to generation and it is not obvious how financial guarantees can be created to take care of them. Viewed from a resource management perspective, there are groups of products that should be given greater priority in an expanded producer responsibility. I therefore make the assessment that there are no reasons to propose a statutory producer responsibility.

However, there is an educational perspective. Toys are children's first possessions of their own. Through the toy industry involvement and contribution of taking back toys that are no longer wanted, the industry can contribute to insight among children at an early age of different ways of economising with resources.

A large proportion of toys are imported. As regards demands for reduced use of chemicals and the design of the product, it may be difficult for a small country to make demands on producers alone. There are therefore strong reasons for co-ordinating demands within the EU.

Paper products from gambling. My recommendation is a voluntary undertaking for paper products from gambling on the basis of the material provided to the enquiry by ATG and Svenska Spel. The aim of the undertaking is, among other things, to increase material recovery by increased sorting at source and to reduce litter.

Agricultural plastic. My recommendation is a voluntary undertaking for agriculture's silage plastic on the basis of the material that the concerned industrial interests have provided to the enquiry. The objective is at least 30 per cent of material should be recovered by 2004. I would additionally like to underline the importance of the plastic that cannot be recovered being incinerated according to current rules.

Summary assessment and recommendations. I have carried out a number of case studies of products to see whether there are reasons for suggesting an expansion of the statutory producer responsibility. I have arrived at the conclusion that there is s a clear need for an increased taking of

responsibility on the part of the producers to reduce the quantity of landfilled waste, and resource-efficient use of energy and materials, reduce use of hazardous chemical substances and litter.

However, products in which there are clear justifications for a statutory producer responsibility with immediate effect have not yet been identified. There are a number of reasons for this, a large part of the products have a lifetime of several decades, sometimes a hundred years or more. It is difficult then to create financial guarantees for the fulfilment of producer responsibility and time is needed to find forms that could work. In many cases, an expanded statutory producer responsibility would entail an overlapping of existing ordinances. This can create problems as regards the issue of responsibility, which also requires time to clarify. There are also examples of products where reuse and recycling have made a lot of progress without legislation and where new legislation in the field of waste will serve as a driving force for further measures.

As an alternative to an expanded statutory producer responsibility, it is recommended that extensive efforts to permit producers to develop voluntary initiatives are undertaken.

In some cases, proposals exist for voluntary undertakings in this report, based on the material submitted by the affected parties. This is the case for products that are in the border zone of current ordinances, agriculture's silage plastic and paper products from gambling. For the construction sector, there is a proposal on a renewed voluntary undertaking. Some products that can be of interest for new voluntary undertakings, besides those already mentioned, are heavy vehicles, textiles and shoes, furniture, timber and toys.

In order to obtain sufficient interest and back-up from the business sector as regards voluntary initiatives, it is important that the government underlines the importance of this work and its will to support it and monitor it. One possibility for quickly starting this process is to create a dialogue and consultation body that is close to the government.

It is, therefore, recommended that the governments appoint a delegation or committee which will be instructed to assume a driving and supporting role in contacts with the business sector over a three to five year period. I also recommend that a special preparatory group with experts from different ministries be instructed to monitor this work. If these initiatives work well, there may be reason to establish a permanent organisation.

6. Recommendations on improvements of the current producer responsibility and systems for returnable beverage containers

Overall issues

The intention and objectives of producer responsibility. There are different reasons to make producer responsibility clearer by certain amendments to the Environmental Code. By producer responsibility in this context, all products are included, *i.e.* including those that are not subject to statutory producer responsibility. The intention of the amendments to the law being proposed is to create a clearer connection between legislation and the policy work that is taking place within IPP (Integrated product policy), where statutory producer responsibility and voluntary undertakings are a part of the policy work.

The first proposition concerns a supplement in Chapter 1, Section 1, of the Environmental Code. This recommendation entails that the Environmental Code's preamble paragraph be complemented, so that the issue of an environmentally compatible product development be more clearly expressed as an issue of special importance in order to achieve the objectives of the code. According to the proposal, a new sixth point is to be introduced in the second paragraph, which establishes that the Environmental Code is to be

applied so that the impact on health and environment of goods and products is kept to a minimum with the whole life cycle in mind.

Further, it is recommended that an amendment is made to Chapter 15, section 7 of the Environmental Code to the effect that the government or the agency appointed by the Government be authorised to notify regulations on the composition, reuse and recyclability of other goods and product groups besides packaging.

It is recommended that government should consider introducing a new interim target on resource-efficient use of material and energy for goods and services viewed in a life-cycle perspective. This is an interim target of the environmental quality objective of a *Good built environment*. The proposed complement means that the most important aims of producer responsibility and IPP should not only be reflected in the environmental quality objectives but also in the interim targets.

As regards the issue of setting objectives at the local and regional level for waste that is subject to producer responsibility, it is considered that this would entail an unnecessarily detailed regulation. I t is proposed that there would be monitoring at the municipal level of all fractions, which are collected from households, and that these be presented as a quantity collected per inhabitant and year. If the national objectives are not achieved, there will then be a basis for assessing the results and the need of further measures on a municipal basis taking into consideration local conditions.

It is recommended that the requirements of the Ordinance on Landfilling of Waste on sorting of combustible waste be co-ordinated with the recycling objectives in the ordinance on producer responsibility for packaging. This should take place in conjunction with the implementation of the EU's revised packaging directives in Sweden.

Increased use of recovered raw material. It is proposed that industrial associations, materials companies and individual enterprises intensify their efforts aimed at increasing use of recovered raw material and that a life-cycle perspective is taken into consideration. It is also desirable that the proportion of recovered raw material in products is reported.

Improvements from a consumer perspective. An evaluation of the alternatives as regards the responsible agents for the collection of packaging and waste paper from households was conducted. One alternative is for the municipalities to take over responsibility for collection, the other alternative is that the producers (materials companies) retain responsibility and improve their systems. The intention has been to create clearer roles among the participants and more efficient systems. It is proposed that responsibility shall remain with the producers (the materials companies) and that they should improve the systems on the basis of the voluntary initiatives that they have submitted to the enquiry. This proposal is in line with the vision of the future in which waste shall eventually become a resource that is processed on functioning markets.

It is recommended to expand collection close to properties as an important way to increase service and accessibility for consumers. This should be developed on a voluntary basis and in co-ordination between materials companies, municipalities, property owners, collection contractors, and consumers. Before collection in the vicinity of properties is introduced, the environmental and financial effects should be considered in each case. It is also important that alternative technical solutions be considered for the choice of collection systems. It can be financially beneficial to co-ordinate collection of waste paper and packaging with other household waste.

It is recommended that producers and materials companies in consultation with municipalities, among others, intensify information to consumers as regards collection of packaging and waste paper.

Information is required about how the time for work in connection with sorting at source can be reduced, on the benefit of sorting at source and in certain cases information about sorting.

It is recommended that the materials companies continue to try to find suitable solutions for rural areas and that the requirement of at least 500 persons in a collection district should not necessarily be linked to an all-year-round shop for establishment of a collection point. It should also be possible to locate recycling stations in the neighbourhood of schools, day care nurseries, and village halls or in the vicinity of other traffic flows.

Additional information efforts are required for institutional households and other activities with packaging and paper waste. My recommendation is that the work of information that has been started in collaboration between the materials companies and institutional households should continue and that information should if possible be specially adapted for other types of activities.

Reduced monopoly effects. I note that various initiatives are in process and planned on the part of the materials companies to reduce existing tendencies to monopoly. My view is that it is appropriate to allow this work to continue with voluntary undertakings as regards taking action against collection and client monopolies. However, it is important that this work is monitored.

It is therefore proposed that the Competition Authority be instructed to evaluate producer responsibility and competition within a couple of years to see what are acceptable consequences of legislation and the effects that the voluntary efforts have had.

It is propose that new forms of responsibility should be tried out on a voluntary basis as regards waste from activities. The new form of responsibility means that those who produce waste that is subject to product responsibility also bear the financial and physical responsibility for its collection.

The intention is to strengthen the presence of market solutions in the field of recycling, which is a part of my vision. This model can appropriately be developed and tested within the framework of the organisation for development of voluntary initiatives that I have proposed. In this assessment, the voluntary initiatives for agricultural plastic could constitute a pilot project as regards testing new forms responsibility for those who produce waste.

Tools to assess and reduce environmental impact from products. The LCA tool is a good tool for producers who want to show that they comply with the knowledge requirement according to the Environmental Code and it is well in accord with the work of the EU within IPP (Integrated Product Policy). It fulfils an important function when the producer has to show that the introduction of new material and new product design has been made on an environmental perspective. The Commission's assessment is that the time is not yet ripe for a legislature demand for producers to carry out standardised life cycle analyses. Hence, the proposal is that the LCA tool should be further developed, for instance, within the framework of the Environmental Protection Agency's work to co-ordinate and make more efficient the Integrated Product Policy (IPP).

It is recommended that producers, on a voluntary basis and in consultation with the Swedish Consumer Agency, expand the sorting instructions on packaging. The Swedish Consumer Agency should be instructed to initiate this work. If this does not work, the Environmental Agency can consider issuing regulations with requirements for sorting instructions pursuant to section 13 of the Packaging Ordinance.

As regards larger products which are not to be taken part by the consumer and which are covered by voluntary undertakings or statutory producer responsibility, some form of permanent labelling is required on the product informing the consumer of what the different parts of the product contain. It is recommended that the permanent marking tool be further developed, for instance within the framework of

the work of the Environmental Protection Agency to co-ordinate and make effective the existing Integrated Product Policy (IPP).

Supervision. It is recommended that Chapter 15, section 6, of the Environmental Code be complemented with a view to creating better opportunities to exercise supervision of the producers that do not comply with their responsibility. Each individual producer must be able to show that his goods or packaging are included in a collection system that meets certain requirements and which is approved in a special arrangement or that the individual producers' own systems are notified to a competent authority. An environmental sanction fee targeted at producers who breach these rules should be put into place to support these demands.

The proposal moreover contains demands that the collection systems as better organised and effectively supervised. In this way, the activities of the materials companies will be regulated in legislation and create a formal basis for agency requirements directly targeted on them. The fact that is not possible in the present system has been considered to be a deficiency.

Monitoring. It is proposed that the waste, which is collected from households, be monitored on a municipal basis and that they are presented as collected quantity per inhabitant per year. A better feedback loop is required on how households' sorting at source develops over time. The materials companies for packaging and waste paper have submitted a voluntary initiative for monitoring from 2002. The Environmental Protection Agency proposes in its government instruction on ecological handling of household waste that regulations concerning municipal monitoring be produced.

It is recommended that monitoring of activities continue to take place at national level.

7. Proposals concerning individual producer responsibility

Packaging. It is proposed that the material recovery targets for aluminium and steel containers be combined in a common target in the Ordinance (1997:185) on Producers' Responsibility for Packaging and that the recovery levels for packaging of metals be retained according to the existing ordinance.

It is further recommended that the materials companies continue to work on the basis of the initiatives submitted to the enquiry with a view to achieving the new, higher recovery targets that are in force from 1 July 2001. However, the assessment indicated that the Plastkretsen [Plastic group] needs to increase its levels of ambitions over the plans submitted to the enquiry if the objectives are to be achieved. This applied both to increased information initiatives to municipalities and activities.

Cars. The proposal is that the government should initiate an enquiry with a view to making more stringent car owners obligations and limit the possibilities of temporary de-registration with a view to presenting dumping of scrapped cars.

It is proposed that possibilities of managing and using the car scrapping fund more effectively be further examined. Such an enquiry should also take up the issue of the demands of the EC directive for a cost-free handing of cars that are not subject to producer responsibility.

Further research and development are recommended on the approach that has been undertaken with a view to finding cost-effective recycling solutions for cars so that the objectives can be achieved in the longer term.

It is recommended that the Swedish Environmental Protection Agency carry out information campaigns to increase knowledge among the smaller importers of cars with a view to those who are not

official *marque* representatives for cars being able to comply with their obligations as importer and producer.

It is recommend that certification of car dismantling facilities be investigated with a view to increasing environmental compatibility and preventing distortion of competition.

Tyres. The recommendation is to amend the Producer Responsibility Ordinance for Tyres so as to be compatible with the Ordinance (2001:512) on Landfilling of Waste. The reformulation entails more stringent demands to avoid landfilling.

It is recommended that requirements for reduced use of environmentally hazardous substances in tyres be pursued in conjunction with further work to implement EU chemicals policy .The motive is that the major part of tyres are manufactured outside Sweden.

Both national government and Svensk Däckåtervinning AB finance, conduct research on how to shows the environmental and socio-economic benefits of various ways of taking care of end-of-life tyres, through re-use, material recovery and use as a source of energy. The intention is to obtain better knowledge about the method of handling that should be given priority.

Waste paper. The Ordinance (1994:1205) on Producer Responsibility for Waste Paper should be amended in such a way that the definition of producer be narrowed down and more succinctly defined. This proposal means that those who print or have newspapers printed are to be exempt from the category of responsible producers. Newspapers in this context include magazines, direct advertising, telephone directories, mail order catalogues, and similar products made of paper. Despite this amendment, the same quantity of waste paper will be covered by the ordinance as before. The intention is to reduce the problem with non-compliance and simplify supervision.

Office paper. It is suggested that the Swedish Environmental Protection Agency together with the affected parties produce a new voluntary initiatives that would contain increased target levels for collection of office paper.

Returnable beverage containers. It is proposed that steel cans be included in the deposit-refund system and regulated in the same way as aluminium cans, according to the Act (1982:349) on Recycling of Aluminium Beverage Containers. In conjunction with steel plate being included in the Act, its name should be changed to the Act on Recycling of Metal Beverage Containers. Steel cans and aluminium cans should be commonly defined as metal cans. The recommendation also leads to certain other consequential changes in the Ordinance (1997:185) on Producer Responsibility for Packaging.

The definition of the packaging to be covered by the Act (1991:336) on Certain Beverage Containers is changed from solely referring to PET containers to include all containers of ready-to-drink beverages made of polymer material.

It is recommended that both the Ordinance (1991:338) on Certain Beverage Containers and the Act (1982:349) on Recycling of Aluminium Beverage Containers be amended in a way to allow for a check of illegal import and trade with PET bottles and returnable beverage cans.

It is recommended that the supervisory responsibility of the Environmental Protection Agency under the Ordinance (1991:338) on Certain Beverage Containers be transferred to the Swedish Board of Agriculture.

The Commission proposed that industry through its own undertakings solve the problems with non-achievement of the recycling targets for aluminium cans and recyclable PET. The industry has presented plans to the enquiry for extensive information activity aimed at achieving the targets.

The food trade and the brewing industry improve service to consumers by increasing the number of reception points with machines for accepting returnable beverage containers. This increase is motivated, among other reasons because new types of stores are developing. It is considered that Systembolaget AB should improve its participation in the return system in a tangible way in addition to the material that has been presented to this enquiry.

In the evaluation of returnable beverage containers, the need for financial efficiency has been highlighted. The recommendation is to have industry itself undertake measures by the voluntary initiatives presented to the enquiry.

Electrical and electronic products. It is recommended that an addition on Producer Responsibility for Electrical and Electronic Products in the form of a reference in the Ordinance (2001:208) be made to clarify the authorities that should exercise supervision.

It is proposed that a supplement be made to the Refuse Collection Ordinance (1998:902) in the form of a new section, section 25a. This section means that a demand for sorting at source is introduced for waste from electrical and electronic products.

8. Financial guarantees for the completion of producer responsibility

Comparison between different kinds of financial guarantees. I have examined a comparison that has been made between different types of financial guarantees which could be of interest in guaranteeing compliance with producer responsibility. The alternative is a traditional insurance solution, captive insurance, or the producer making a deposit in a fund of his own or a state fund. These alternatives have been analysed with respect to the security offered by the system as regards compliance with producer responsibility, incentives for the producer to make the product environmentally compatible and the possibility for a market return on the capital deposited by the producer.

The evaluation shows that the greatest security for compliance with producer responsibility is obtained by a state fund and secondly by a traditional insurance solution. Security cannot be completely guaranteed in the captive insurance alternative or by an alternative of the producer making a deposit in a fund of his own.

Both types of insurance solution and the alternative where the producer makes deposits in a fund provide an incentive for the producer to make the product environmentally compatible and the opportunity for a market return on the capital invested. Funds with the same charge for all regardless of the design of the product, provide scant incentives for environmental product improvements. As regards state funds, funds should kept separate from central government finances in order to permit a market return on the funds.

In-depth analysis of the insurance solution. With the exception of an in-depth analysis of the possibilities of using a traditional insurance solution for producer responsibility, I note the following:

The Swedish insurance industry is positive to finding insurance solutions for producer responsibility.

Goods that are relatively large in volume and have a low turnover rate are suitable for insurance solutions. Goods that can be covered by such a solution are for instance white and brown goods and, if producer responsibility is to apply to these products, other motor vehicles.

A voluntary or compulsory insurance solution for producer responsibility, guarantees financial security is guaranteed at the end of the product's lifetime even if the producer is insolvent or has ceased operations. Moreover, exactly as in the case where the producer makes his own deposits, the cost for the consumer is low as the insurance premium earns interest and there is an incentive to make environmental product improvements.

A large portion of knowledge needed allows an insurance company to calculate premiums and deal with the product must be obtained from the manufacturer of the product. An advantage with the producer being responsible for the financing is that there is a closer connection between the design of the product and the provisions the company is forced to make. The producer receives a clear incentive to adapt the product to the eco-cycle.

In conclusion, the assessment indicated that traditional insurance is not a suitable solution for all types of products. Since financial guarantees are to be considered for a product group, other solutions should be taken into consideration, everything from funds and insurance solutions to materials companies. The purpose should be to find an optimal solution in the individual case. It is proposed that a committee or delegation be appointed to develop work with voluntary undertakings in a dialogue and consultation with the business sector. This should also include the task together with the affected industries so considering different types of financial guarantees.

PRODUCT STEWARDSHIP INITIATIVES IN THE UNITED STATES: A NATIONAL AGREEMENT FOR CARPET

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1. Introduction

This paper will summarise the recently concluded agreement with the carpet industry in the United States to assume responsibility for discarded carpet according to a ten-year schedule. The initiative with the carpet industry arose from the State of Minnesota's efforts to develop and adopt a product stewardship policy and subsequent decision to examine voluntary initiatives to achieve product stewardship outcomes.

The Midwestern Workgroup on Carpet Recycling, a multi-stakeholder process to examine product stewardship for carpet and facilitated by the University of Tennessee, was convened in 2000 as the first initiative to establish a voluntary product stewardship agreement. The Workshop resulted in a commitment to establish national negotiated reuse and recycling goals for carpet and the creation of a producer responsibility organisation charged with achieving the ten-year schedule for the recycling and reuse of carpet.

As well as examining the elements contributing to a successful initiative, the paper will describe the barriers and opportunities to initiating a state-led product stewardship initiative that addresses products manufactured by national and international producers.

The paper will also identify how the experience with the carpet industry may inform other product stewardship efforts for consumer products in the US, most notably PET containers and consumer electronics.

2. Product Stewardship in Minnesota

In an attempt to develop a framework for product stewardship in Minnesota, the Minnesota Office of Environmental Assistance (OEA), a state agency, developed a product stewardship policy proposal for consideration during the 1999 legislative session. The proposal articulated a comprehensive framework for product stewardship signalling the state's expectations for all players involved in the manufacture, sale, use, and disposal of products.

The policy was motivated by the growth in Minnesota's waste generation and the subsequent escalating costs for managing waste. Minnesota's per capita waste generation increased by 21% between 1992 and 1998. If present trends continue, MSW generation is Minnesota may increase as much as three fold by 2020. Spending on household hazardous waste (HHW) programs in Minnesota nearly doubled between 1993 and 1997 to $7.1 million. Faced with such ominous projections, the question of who should bear the financial burden for managing waste becomes critical.

While Minnesota has adopted the term "product stewardship" for product-oriented policy development, followers of environmental policy will recognise several related terms such as shared responsibility, extended producer responsibility, and manufacturer responsibility. These terms are often used interchangeably, though each term differs slightly in its assigning of roles for responsibility for a product's life-cycle.

Minnesota defines product stewardship as follows: "all parties who have a role in designing, producing, selling, or using a product shall assume responsibility for the environmental impacts of that product throughout its life." While often characterised as simply a tool for end-of-life management or product take-back, in this context, product stewardship presents a comprehensive framework addressing all steps in the product life-cycle from the selection of materials, the production processes, and the impacts from the products use and ultimate disposal.

The product stewardship policy, as proposed by the OEA, advances several environmental and economic goals. First, product stewardship provides cues to manufacturers to examine their products from a life-cycle perspective and to improve product design while enhancing environmental attributes. This may mean redesigning products to reduce or eliminate toxic constituents or reduce the number of components to promote recyclability. Second, Minnesota's version of product stewardship emphasizes the environmental impacts of product disposal and is expected to lead to higher recovery and recycling rates. Third, under this product stewardship framework, the financial responsibility for managing products at end of life is borne by manufacturers and users rather than the general taxpayer.

While the proposal acknowledges that all stakeholders along the product chain have a responsibility to minimise environmental harms during the product's life-cycle, the manufacturers are best positioned to reduce adverse impacts through product design. Manufacturers, while stipulated as financially responsible in the proposal, are provided significant flexibility in how to meet the expected outcomes. Depending upon the product, manufacturers may choose to meet the requirements through means such as offering a product leasing program or establishing a producer responsibility organisation whereby manufacturers band together to offer a unified collection and management program.

While the OEA believes that a comprehensive framework for product stewardship is warranted, the proposal identified several specific products, identified as priority products, including CRT-containing products (such as televisions and computer monitors), paint, and carpet as good candidate products for stewardship initiatives. In an effort to bypass the "product of the month" approach to managing troublesome products, the proposal identified a process, sanctioned by selection criteria, whereby additional products could be assigned priority product status. This process ensures that a uniform approach to managing problem wastes is established and a common of set of expectations is applied to those products.

3. Product Stewardship Strategy

The concept of product stewardship, initially referred to as "extended product responsibility" in the US, was promoted by the President's Council on Sustainable Development (PCSD) during the Clinton Administration. However, Congress has yet to define a clear federal role to promote product stewardship. In the absence of a pronounced federal role, product stewardship in the United States can be characterised as dominated by state-led, voluntary initiatives with support from US EPA and non-governmental organisations.

In an attempt to implement the voluntary approach to product stewardship, Minnesota convened multi-stakeholder taskforces for latex paint and electronics with CRTs in 1999. Recognising the limitations of an individual state enacting a product stewardship agreement with manufacturers, the OEA approached the neighbouring states of Iowa and Wisconsin to convene a dialogue with carpet manufacturers.

4. Carpet and Product Stewardship

As opposed to other products often considered for product stewardship, very little government policy, at either the federal or state level, exists to promote the recycling of discarded carpet. Carpet was identified as a product ripe for consideration under a product stewardship system due to a number of factors, including the difficulty of managing this bulky product within the traditional municipal solid waste infrastructure, the growth of manufacturer-based reclamation services for commercial carpet, and the opportunity to recycle post-consumer carpet into a variety of value-added applications.

Many critical issues are pertinent to an understanding of the potential for enhanced product stewardship of carpet in the United States. These include:

- Approximately 4.7 million tons are disposed annually in the US;
- A reuse and recycling rate of less than 5%;
- 65% of carpet sales are for residential application;
- Approximately 55 domestic manufacturers of carpet and four major resin producers supplying fiber to the industry (this number continues to shift based on continuing consolidation within the industry);
- Carpet Recycling Europe (CRE) PRO based in Germany;
- Several companies (*e.g.* Collins & Aikman, Milliken) have instituted innovative reuse and recycling programs for commercial carpet; and
- A limited collection infrastructure, particularly for residential carpet.

5. Midwestern Workgroup on Carpet Recycling

The states of Minnesota, Iowa and Wisconsin and US EPA convened the Midwestern Workgroup on Carpet Recycling to examine the development of a product stewardship system for discarded carpet in January, 2000 and concluded initial work in November. The multi-stakeholder dialogue included approximately 30 stakeholders representing carpet manufacturers, raw material suppliers, carpet retailers, installers, federal, state and local governments as well as NGO representatives. The dialogue was planned and facilitated by the Center for Clean Products and Technologies at the University of Tennessee.

The Midwestern Workgroup participants signed a Memorandum of Understanding (MOU) in January, 2001 to initiate the creation of an industry funded and managed third-party organisation to be responsible for the collection and recycling of discarded carpet. The MOU also stipulated that industry and government would continue a stakeholder dialogue and jointly develop “Negotiated Outcomes” for carpet stewardship, including a ten-year schedule of national reuse and recycling rates for discarded carpet. The MOU also stated that a set of model procurement guidelines would be developed and implemented by government to enhance and promote the stewardship activities of the industry.

6. Negotiated Outcomes

The Negotiated Outcomes group, a newly-convened stakeholder group, met between March and October 2001 to establish national reuse and recycling rates for discarded carpet over a ten-year timeframe. This group was composed of approximately 30 stakeholders representing 7 state governments, the federal government, carpet and fiber manufacturers, and environmental NGOs. The carpet industry, represented by the Carpet and Rug Institute, articulated a long-term goal to completely eliminate the disposal of carpet. The Negotiated Outcomes group agreed upon a broad goal of forty percent diversion of carpet from landfills.

Several of the carpet and resin manufacturers proposed that the Negotiated Outcomes group examine the inclusion of carpet as feedstock for cement kilns and waste-to-energy (WTE) facilities. At present, very little carpet is being diverted to such facilities in the US for use as an alternative fuel. The states involved reluctantly supported limited goals for carpet directed to cement kilns and WTE as another potential outlet to support the collection infrastructure.

After more than six months of continued discussion, the Negotiated Outcomes group reached consensus on creating a national framework for carpet stewardship; the agreement (see Attachment A) is structured as an MOU (distinct from the original MOU signed in January 2001). The Parties to this Agreement have established the following national goals for 2012. The Parties further agree to a total landfill diversion goal of 40% to be achieved by the following range of management methods and allocated as follows:

(1) Reuse: 3-5% At least 200 million to 340 million pounds (101,500 to 169,500 tons).

(2) Recycling: 20-25% At least 1.4 billion to 1.7 billion pounds (677,000 to 846,500 tons).

(3) Cement kilns: 3% or 200 million pounds (100,000 tons).

(4) Waste-to-energy: 1% or 67 million pounds (34,000 tons).

The Memorandum of Understanding stipulates that the carpet industry, through a third-party organisation called CARE (Carpet America Recovery Effort), will be responsible for meeting the Negotiated Outcomes.

7. Implementation

The Memorandum of Understanding is set to take effect in January 2002 with the official signing of the agreement by the participating entities. While the agreement represents a significant milestone for voluntary product stewardship initiatives in the United States, several challenges exist for successful implementation of the agreement.

While the markets for post-consumer carpet are expanding, many technical and logistical problems exist to ensure the viable markets necessary to achieve the negotiated outcomes. Of particular concern is the recent closure of the depolymerization facility in Augusta, Georgia, previously the largest end-market for collected carpet in the US. The end-market limitations will require a concerted effort to support research and development activities for new products and applications.

As with other producer responsibility organisations, the CARE organisation will need to fully incorporate the often divergent perspectives of the individual carpet manufacturers and act in a co-ordinated fashion. Such co-ordination requires a cultural transition amongst competitors to act collectively on behalf of the industry as a whole.

The agreement articulates a role for government in supporting the achievement of the negotiated outcomes through the provision of, amongst other support, technical assistance and government procurement of environmentally-preferable carpet. However, government engagement to ensure the achievement of the negotiated outcomes will also be required to participate and analyse the evaluation towards meeting the goals by the CARE organisation.

8. Lessons Learned

The process to develop a voluntary agreement with the carpet industry has yielded several lessons that should be considered when constructing dialogues with similar desired outcomes.

A clear statement of expectations and desired outcomes, in this case developed by the government conveners, was essential to establishing a dialogue with a product stewardship system as the expected outcome. In the case of the Midwestern Workgroup, the expectations that were framed by Minnesota's product stewardship policy not only directed the course of the dialogue but raised the spectre of government intervention pending the failure of a voluntary agreement. The backdrop of government policy or legislation not only inserts an incentive for participation by impacted industry members but also is useful for a clear statement of expectations by the government entities.

The process also benefited from a defined timeline to achieve an agreement rather than open-ended discussion. In an atmosphere of competing demands for staff and financial resources, stakeholders were all respectful of the need to keep to goals and milestones established for the dialogue. Additionally, as the group became more enthused about possible outcomes of the dialogue, they were more willing to establish expanded timelines as required.

Importantly, the government convenors solicited participation from the leading industry innovators in the expectation that as the dialogue developed, other manufacturers would be compelled to participate. By pursuing product stewardship objectives initially with the leading companies, the competitive nature of the industry ensured that broad participation would be forthcoming.

Having an outside facilitator familiar with product stewardship and EPR initiatives proved to be quite useful. For the carpet dialogue, it was key to stress that the facilitation role was not to be one of a classic, unbiased facilitator, but rather one that would advocate for the process and for a product stewardship outcome as well as to provide research of benefit to stakeholders and the process during the dialogue. As negotiations progressed, the facilitator was also able to work between parties to help bridge differences of opinion and keep the negotiations on track.

The carpet initiative also stressed the importance of a consensus approach to establishing quantifiable reuse and recycling goals. Such consensus was not only needed on the specific numerical goals to be achieved within a specified timeframe, but also on the methodology for establishing the baseline data.

9. Implications for other products

While the agreement with the carpet industry is the first voluntary national product stewardship agreement in the US, several other initiatives are underway that are similar to the multi-stakeholder approach employed with carpet. Many of these initiatives are using the carpet dialogue as a reference in pursuit of the unique product stewardship issues related to the products under consideration.

The National Electronics Product Stewardship Initiative (NEPSI) was launched in June 2001 and is expected to conclude in late 2002 with a national agreement creating a collection and recycling system for consumer electronics with a significant, defined role for manufacturers. This process has been convened with approximately 45 stakeholders representing electronics manufacturers, 15 federal, state, and local government representatives, environmental NGOs, and recyclers.

A similar product stewardship effort has also been created to solicit greater manufacturer responsibility for beverage containers. The dialogue initiated by a coalition of businesses and environmental advocacy organisations to develop recommendations to achieve an 80% recycling rate for beverage containers nationally.

Inspired by the manufacturer responsibility measures for automobiles in several European nations as well as by the European Union, several states as well as environmental research and advocacy organisations are examining opportunities to promote product stewardship for discarded automobiles. Most prominently, there is interest in reductions in toxic materials in automotive applications and increases in amounts of recycled content as the primary drivers for pursuing product stewardship within the auto industry.

A Memorandum of Understanding on Carpet Stewardship

This Memorandum of Understanding (Agreement) is entered into between the undersigned carpet manufacturers, fiber manufacturers, material suppliers, (hereinafter collectively referred to as the Carpet Industry) state governments, the U.S. Environmental Protection Agency (hereinafter collectively referred to as Government Entities), and non-governmental organizations (hereinafter collectively referred to as NGOs) as an expression of their good faith agreement to accomplish the Negotiated Outcomes Goals pursuant to the roles and responsibilities set forth in this Agreement.

Creates No Binding Obligation

Nothing contained in this Memorandum of Understanding is intended to create a legally binding obligation or rights on any signatory hereto or any third party not a signatory to this agreement. Notwithstanding any language used herein that may give rise to a contrary implication, this document creates no legal rights or obligations.

Preamble

This memorandum represents a voluntary, good faith and transparent partnership between the Government Entities, members of the carpet industry and NGOs to increase the value recovered from post-consumer carpet. While the focus of the Negotiated Outcomes is to increase the reuse and recycling of carpet, the signatories recognize that long-term efforts must address all the social, environmental and economic facets of what is becoming commonly known as sustainable development.[1] This agreement is meant to promote the concept of product stewardship, which asks manufacturers to reduce the environmental impacts of their product throughout its life cycle.[2]

While technical, logistical and communications barriers exist to economically recovering carpet, the Negotiated Outcomes signatories are committed to working together to overcome these barriers and to develop a system that treats discarded carpet as a resource rather than a waste product.

Issue background

In January 2001, the Carpet and Rug Institute (representing over 90% of the carpet industry) and the Minnesota Office of Environmental Assistance (representing state governments participating in the Midwestern Workgroup on Carpet Recycling) signed a Memorandum of Understanding to achieve the following:[3]

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1 Sustainable development means development that maintains or enhances economic opportunity and community well being while protecting and restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.

2 Product stewardship means that all parties involved in designing, manufacturing, selling and using a product take responsibility for environmental impacts of the product at every stage of that product's life.

3 For more information on the Midwestern Workgroup on Carpet Recycling and the January 2001 Memorandum of Understanding, please see http://www.moea.state.mn.us/policy/carpet/.

- **Negotiated Outcomes.** To achieve the goal of a flexible and sustainable voluntary industry-led approach, manufacturers and government will develop a negotiated schedule for the eventual elimination of land disposal and incineration with energy recovery of post-consumer carpet and establish escalating goals for recycling and reuse, both in a manner consistent with resource conservation.[4] It is recognized that significant technical and logistical challenges currently exist that will require finding new or yet unrecognized solutions.
- **Third-Party Organization.** The carpet industry will establish a small and effective third party organization (3PO) that will be responsible for seeking to achieve the negotiated outcomes to increase the recycling and reuse of post-consumer carpet in a manner consistent with resource conservation. It is understood that the 3PO will examine the formulation of partnerships, joint working relationships, joint promotion, and joint responsibilities in order to achieve the negotiated outcomes.
- **Model Procurement Guidelines.** It is further understood that the workgroup will seek to develop and agree upon model procurement guidelines for public entities to adopt. These model procurement guidelines for environmentally preferable carpet will be tailored to support the efforts of the third party organization.[5]

With the signing of the January 2001 Memorandum of Understanding, state governments and the carpet industry agreed to jointly develop the Negotiated Outcomes Goals.

The Negotiated Outcomes participants (hereinafter collectively referred to as the Negotiated Outcomes Group) included carpet manufacturers, the Carpet and Rug Institute, fiber manufacturers, material suppliers, seven state governments (California, Iowa, Maryland, Massachusetts, Minnesota, North Carolina and Oregon), the U.S. Environmental Protection Agency, and non-governmental organizations (the Northeast Recycling Council and the Reuse Development Organization). The Negotiated Outcomes process was facilitated by the Center for Clean Products and Clean Technologies at the University of Tennessee.

NOW THEREFORE, the undersigned parties to this Agreement agree as follows:

1. Aspirational Goal

As stated in the January 2001 Memorandum of Understanding for the Midwestern Workgroup on Carpet Recycling, the aspirational goal is the development of a flexible and sustainable voluntary, industry-led initiative by which manufacturers and government will develop a negotiated schedule for the eventual elimination of land disposal, incineration and incineration with energy recovery of post-consumer carpet and establishing escalating goals for recycling and reuse consistent with resource conservation. The Negotiated Outcomes Goals should be viewed as steps toward the industry's long-term commitment to achieve the aspirational goal.

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4 The term resource conservation refers to the reduction in the use of water, energy and raw materials.

5 Since January 2001, state government and industry representatives have been collaboratively working to create model procurement guidelines that will encourage the purchase of environmentally preferable carpet and bolster the Negotiated Outcomes Goals. It is anticipated that the guidelines will be completed by the end of 2001.

2. Negotiated Outcomes

a. Background and Definitions

For the purposes of this Agreement, the Negotiated Outcomes Group established national goals and a ten-year timeframe for the management of discarded carpet, using the following management methods: reuse, recycling, use of cement kilns and waste-to-energy facilities, and landfilling. See Appendix A, Summary of Goal Areas, which is attached hereto and made a part hereof. In establishing these goals, the Negotiated Outcomes Group used available information on the amount of carpet destined for each management method in 2001.

For the purposes of this Agreement, these terms are defined as:

- Reuse: The reuse of recovered carpet in a manner that retains the original purpose and performance characteristics of the carpet.[6]
- Recycling: Recovering or otherwise diverting recovered carpet from the solid waste stream for use in one of the following ways:
    - Closed loop recycling, where the carpet is recycled back into carpet product and/or carpet product components.
    - Recycling into feedstock (raw material) for other value-added products.
- Recycling does not include carpet used for alternative fuels, incineration or waste-to-energy.
- Cement kilns: The use of recovered carpet as an alternative fuel source and as an additive in cement production.
- Waste-to-energy: A technology that uses recovered carpet as a fuel source to generate electricity.
- Landfilling: Landfilling includes the placement of recovered carpet into a permitted landfill disposal facility.

b. Goals for 2012

The Parties to this Agreement have established the following national goals for 2012.[7] The Parties further agree to a total landfill diversion goal of 40% to be achieved by the following range of management methods and allocated as follows: [8] [9]

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6 The term recovered means waste material and by-products which have been recovered or diverted from solid waste, but the term does not include those materials and by-products generated from and normally reused within an original manufacturing process.

7 Please refer to the appendix for a chart with the Negotiated Outcomes Goals for 2012 as well as interim goals.

8 The goals, as stated, do not add up to 40%. The goals for individual management methods are expressed in a range to allow some flexibility to achieve and potentially exceed the 40% overall diversion goal.

9 These goals represent a consensus agreement to recover the maximum amount of value from carpet consistent with resources conservation. Further, it is recognized that cement kiln and WTE applications are lower on the value recovery chain than recycling, but still preferable to incineration and landfilling.

- Reuse: 3-5% At least 200 million to 340 million pounds(101,500 to 169,500 tons).
- Recycling: 20-25% At least 1.4 billion to 1.7 billion pounds (677,000 to 846,500 tons).
- Cement kilns: 3% or 200 million pounds (100,000 tons).
- Waste-to-energy: 1% or 67 million pounds(34,000 tons).
- Landfills and/or incinerators will receive a maximum of 4.1 billion pounds in 2012 or 60% of discarded carpet. For purposes of comparison, the Carpet and Rug Institute provided baseline estimates for carpet disposal in 2002. This estimate shows disposal of 4.68 billion pounds of carpet, with approximately 5% being managed through reuse and recycling opportunities.

These goals for the year 2012 shall collectively be referred to as the Negotiated Outcomes Goals.

To encourage the collection infrastructure for reuse and recycling, the goals for cement kilns and waste-to-energy are the maximum amount of recovered carpet to be directed to these management methods. If new research, large-scale kiln test burn results, or other information is presented to the CARE Executive Committee that the Committee, after deliberation, concludes reasonably demonstrates that an increase in the amount of carpet managed in cement kilns will substantially improve the collection infrastructure for carpet recycling, then the CARE Executive Committee may reconvene the MOU signatories. The MOU signatories will review all relevant data, including an assessment of the economic and environmental benefits, the existing regulatory environment, and the potential for enhanced infrastructure development. If warranted, a change in the Negotiated Outcomes goal for cement kilns will be reached by consensus.

The Parties agree that the Negotiated Outcomes Goals are the first steps toward reaching the aspirational goal of removing carpet from the national waste stream. Pursuant to the terms set forth in Section 4 of this Agreement, the Parties agree that the progress toward the Negotiated Outcomes Goals shall be regularly evaluated and that commencing in 2010 the parties shall set goals for the years 2012-2022.

3. Roles and Responsibilities of the Parties

a. Carpet America Recovery Effort (CARE)

For purposes of implementing this agreement, the Carpet Industry has established a third-party organization known as the Carpet America Recovery Effort (CARE).

The Carpet Industry agrees to work through CARE to achieve the Negotiated Outcomes Goals set forth in Section 2 of this Agreement, using market-based solutions for recovering the value from post-consumer carpet. The Carpet Industry agrees to use CARE to:

- Enhance the collection infrastructure for post-consumer carpet;
- Serve as a resource for technical, economic and market development opportunities for recovered carpet;
- Develop and perform quantitative measurement and reporting on progress toward the Negotiate Outcomes Goals as set forth in Section 4 of this Agreement; and
- Work collectively to seek and provide funding opportunities for activities to support the Negotiated Outcomes Goals.

b. Carpet and Rug Institute (CRI)

CRI commits to the following activities to assist in achieving the Negotiated Outcomes Goals for the management of post-consumer carpet. Provided services include:

- Chairperson of CARE;
- Staff support for each of CARE's committee and subcommittees;
- Secretarial, communication, logistical support for CARE's meetings;
- Act as a technical resource link between the carpet industry and others such as collection agents and value-added manufacturers to maximize the reuse and recycling of carpet; and
- Provide technical consultation and support to other signatories on procurement of environmentally preferable carpet.

c. Carpet Industry [10]

The Carpet Industry acknowledges that it has primary financial responsibility for the implementation of the Negotiated Outcomes Goals.

d. Government Entities

The Government Entities agree to assist CARE in achieving the Negotiated Outcomes Goals set forth in Section 2 of this Agreement. Their tools may include, but are not limited to:

- Participating on the Executive Committee and subcommittees of CARE;
- Increasing the number of states supporting the Negotiated Outcomes Goals;
- Providing technical and financial assistance for market development opportunities, when feasible, to carpet reuse and recycling initiatives;
- Developing, adopting and promoting the model procurement specifications by signatory and non-signatory states; and
- Employing policy and regulatory tools as appropriate to bolster the agreement and implementation toward meeting the goals such as incentives for recycling carpet and/or disposal bans and manufacturer responsibility measures.[11]

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10 "Carpet Industry" refers to the universe of participants involved in the production of carpet, including carpet manufacturers, fiber manufacturers, material suppliers, *etc.* It includes, but is not limited to, the members of CRI.

11 By signing the Agreement, the government signatories in no way abrogate their statutory or regulatory authority and responsibilities, nor remand, repeal, or otherwise alter the laws or regulations of their states and their agencies, including those of regional, county and local governments, and may exercise their statutory and/or regulatory authority during the life of the Agreement.

e. Non-Governmental Organizations

Non-governmental Organizations that are signatories to this Agreement commit to the following activities to assist in achieving the Negotiated Outcomes Goals set forth in Section 2 of this Agreement:

- To participate in one or more of the CARE subcommittees and the CARE Executive Committee as appropriate.
- To provide technical assistance for reuse and recycling of carpet as applicable within the scope of their mission, goals and fiscal circumstances.
- As appropriate, assisting with data collection, public education in support of carpet reuse and recycling, and other outreach efforts.

4. Evaluation and Performance Schedule

a. Progress Reports

The Carpet Industry and the Government Entities agree that they shall be jointly responsible through CARE for monitoring, assessing and reporting on the progress toward the Negotiated Outcomes Goals as set forth Section 2 of this Agreement. While reporting on the progress toward the Negotiated Outcomes Goals is the responsibility of CARE, stakeholders from both the government and non-government organizations will maintain active roles in CARE to assist with data collection, analysis, and program evaluation to ensure transparency in reporting on the status of activity.

In each case where a report is required under this agreement the report shall at a minimum include progress toward meeting the Negotiated Outcomes Goals identified in Section 2, The CARE reporting schedule shall be:

- **Annual Report.** CARE shall publish an annual report on or before March 31 of each year commencing in March 2003. This report shall contain, at a minimum, an update on market development opportunities for recovered carpet, information on quantities managed through the various management options outlined in the Negotiated Outcomes Goals, an assessment of successes and obstacles encountered during the reporting period, a summary from each signatory state on its efforts to remove obstacles and present opportunities within their respective state, an assessment from EPA on federal initiatives taken over the last year and planned initiatives, and an overview of planned activities, financial planning and priorities for the coming year. These reports shall be made available to the public through the CARE website and through any other means the parties deem appropriate. Please see the evaluation criteria below for further detail.
- **2005 Report**. On or before March 31, 2005, CARE shall produce a status report documenting progress made toward meeting the first interim management goals as set forth in Appendix A of this Agreement which is attached hereto and made a part hereof.
- **2007 Report.** In year five (2007), an independent study, supported jointly by the Government Entities and the Carpet Industry and selected by the CARE Executive Committee shall be commissioned to evaluate the progress and identify existing barriers toward meeting the Negotiated Outcomes Goals set forth in Section 2 of this Agreement and the Interim Management Goals. (See Appendix A) A jointly supported and facilitated multi-stakeholder group composed of CARE members will be convened to review the report and develop implementation strategies. If necessary, the study shall conclude with

recommendations for improving the recovery and integrated management of post-consumer carpet**.**

- **2010 Negotiations.** In year eight (2010), CARE and other stakeholders shall create a multi-stakeholder process for developing recommendations and goals for the next ten-year period. Invited stakeholders shall include but not be limited to no less than ____ states, ____ members of the Carpet Industry, the U.S. Environmental Protection Agency, and ___ NGOs.
- **Final Report.** In 2012, CARE shall develop a final report detailing progress made in meeting the Negotiated Outcome Goals of the first ten-year planning horizon as set forth in Section 2 of this Agreement.

b. Evaluation Criteria

Progress toward the Negotiated Outcomes goals shall be evaluated based upon:

1) A quantitative assessment of the amount of post-consumer carpet diverted to reuse, recycling, cement kilns, waste-to-energy, and incineration. This assessment should indicate progress toward meeting the Negotiated Outcomes Goals.
2) An assessment of the economic results/benefits of post-consumer carpet economic activity, such as the number of reuse and recycling establishments, employment, annual payroll, estimated receipts, and throughput of recyclable materials.
3) An assessment of the efforts that have been undertaken by each of the parties identified in Section 3 of this Agreement toward meeting the Negotiated Outcomes Goals.
4) A thorough assessment of the efforts and results to date, including recommendations for changes in strategies and additional efforts to reach Negotiated Outcomes Goals.
5) An assessment of planned efforts by each of the parties as identified in Section 3 of the Agreement for the upcoming year.
6) When feasible, an assessment will be performed of the resources saved as a result of diverting post-consumer carpet from landfills or incineration and a quantification of greenhouse gas and other environmental savings achieved by diverting recovered carpet from landfills.

c. Evaluation Outcomes

1) The signatories to this Agreement shall, after consideration of this information, make a subjective determination by weighting efforts, results, challenges, recommendations and other significant criteria to determine if any overall goals or strategies should be changed.
2) If at the conclusion of the 2007 evaluation period, the signatories to this Agreement determine that CARE has been unable to achieve the interim goals as set forth in Appendix A of this Agreement, CRI (as the industry representative) shall direct CARE to develop a detailed analysis with specific recommendations on how to proceed with an alternative strategy.
3) CARE will then, to the best of its ability, implement these recommendations.

5. Addition of Parties to the Agreement

Parties may be added to this Agreement at any time pending approval by the CARE Executive Committee.

6. Withdrawal of Parties to the Agreement

Any signatory to this Agreement may withdraw at any time upon 60 days notice in writing to all other signatories to the Agreement. The reasons for withdrawal shall be given and offered in the spirit of advising other signatories on improving and enhancing the progress toward the Negotiated Outcomes Goals.

7. Effective Date

This Agreement shall be effective on January 1, 2002.

8. Termination

This Agreement will continue until superseded by another agreement, in keeping with the expectation under Evaluation and Performance Schedule to develop a process and goals for additional planning horizons. However, at the conclusion of the full evaluation and status determination by the signatories to the MOU in 2007, the government signatories shall determine whether the MOU shall remain as the preferred governmental strategy or if an alternative approach is necessary.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement.

Signatories

(Subject to change)

Sherry A. Enzler, Director
Minnesota Office of Environmental Assistance

Werner Braun, President
Carpet and Rug Institute

Richard W. Collins, Director
Waste Management Administration
Maryland Department of the Environment

Bob Durand, Secretary of Environmental Affairs
Commonwealth of Massachusetts

Winston H. Hickox, Agency Secretary
California Environmental Protection Agency

Stephanie Hallock, Director
Oregon Department of Environmental Quality

Liz Christiansen, Division Administrator
Iowa Department of Natural Resources

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Marianne Lamont Horinko, Assistant Administrator
U.S. Environmental Protection Agency
Office of Solid Waste and Emergency Response

Signatory TBD
Interface Flooring Systems

AGREEMENTS ON THE REDUCTION, COLLECTION AND RECOVERY OF PACKAGING WASTE IN NORWAY

A Social Cost-Benefit Analysis of the Targets of the Agreements and an Evaluation of Whether the Agreements are Appropriate and Effective Policy Instruments

by
Knut Krøepelien
Ministry of Environment, Norway

1. Introduction

The following paper summarises the social cost-benefit analysis and the evaluation of the agreements on packaging waste as a policy instrument for achieving Norway's targets that have been set for the collection and recovery of packaging waste. It describes the background behind the targets and the conclusions of the cost-benefit analysis and evaluation of agreements that was conducted by the Norwegian government.

1.1 Description of the Norwegian waste policy and the analytical process.

Norway's strategic objective as regards waste, as first formulated in Report No. 44 (1991-1992) to the Norwegian Parliament – The Storting, requires policy instruments and measures introduced in the field of waste to be based on socio-economic considerations. Report No. 8 (1999-2000) to the Storting makes it clear that this will continue to be an important principle of Norwegian waste policy. This is the background for the social cost-benefit analysis of the targets that have been set for collection and recovery of packaging waste described in this report.

Quantitative targets for collection and recovery levels have been laid down in the voluntary agreements concluded between the environmental authorities and the packaging industry. These agreements were concluded in response to the requirement for greater producer responsibility laid down in important political documents on waste management. The agreements on packaging waste are an important instrument of this aspect of waste policy, and this report includes an evaluation of whether the agreements have proved to be appropriate and effective instruments for achieving the targets relating to waste.

1.2 Summary of Conclusions

The following main conclusions can be drawn from the social cost-benefit analysis and the evaluation of the agreements on packaging waste as a policy instrument for achieving Norway's targets:

- The agreements on packaging waste have been an effective means of achieving high collection and recovery levels for packaging waste.

- The targets set in the agreements have either been achieved (in the case of brown paper) or are nearing achievement. Good progress is being made towards achieving the targets fully for all materials, although somewhat later than the deadlines set in the agreements.

- If the agreement for the classification of packaging materials is followed, Norway will have achieved the targets set out in the EU directive on packaging and packaging waste (94/62/EC).

- The overall social benefits to be obtained by achieving the operational targets of the agreements are estimated at just over NOK 600 million in 2000. However, this figure is based on a number of underlying assumptions with a high level of uncertainty.

- Sensitivity analyses (of the time costs of sorting, material and energy prices, and environmental costs) show that changes in these factors will of course affect unit prices and thus the end result. However, it should be noted that none of these analyses indicated that the overall socio-economic benefit of NOK 600 million would be reduced so far as to become negative, *i.e.* a cost to society.

- If the various material types are considered separately, the analysis shows that the economy of the system and the levels of collection and recovery are good for plastic and brown paper, whereas the positive results for folded carton and glass are much less robust. For beverage cartons and metal, the results are negative, but not very significantly. The differences in the results largely reflect differences in where the waste is generated and the types of collection schemes that have been chosen. The analyses suggest that there may be reason to adjust the target figures in the agreements.

There may also be reason to change other elements of the agreements on packaging and packaging waste. The main conclusions of this evaluation are elaborated in the following sections.

2. Evaluation of the packaging agreements as instruments of waste policy

The agreements on packaging and packaging waste were one of several policy instruments established to deal with waste management. It is very difficult to isolate the importance of a particular instrument for the results achieved with respect to packaging waste. Our task was not to consider whether the same results could have been achieved in a different way, but to evaluate whether the agreements on packaging have been an effective and appropriate way of achieving Norway's targets. However, in doing this we have also evaluated how other policy instruments have contributed to these targets.

2.1 Results

The agreements describe in detail the obligations of each of the parties. The agreements were thoroughly evaluated in 1998 by the Norwegian Pollution Control Authority and the packaging industry, and the results were published in September 1998 in a report entitled *Evaluering av emballasjeavtalene*. The main conclusions of the report were as follows:

Both parties have generally followed up the requirements set out in the agreements.

- It appears to be possible to achieve the target figures for waste recovery within a reasonable time frame. The recovery target has already been achieved for brown paper,

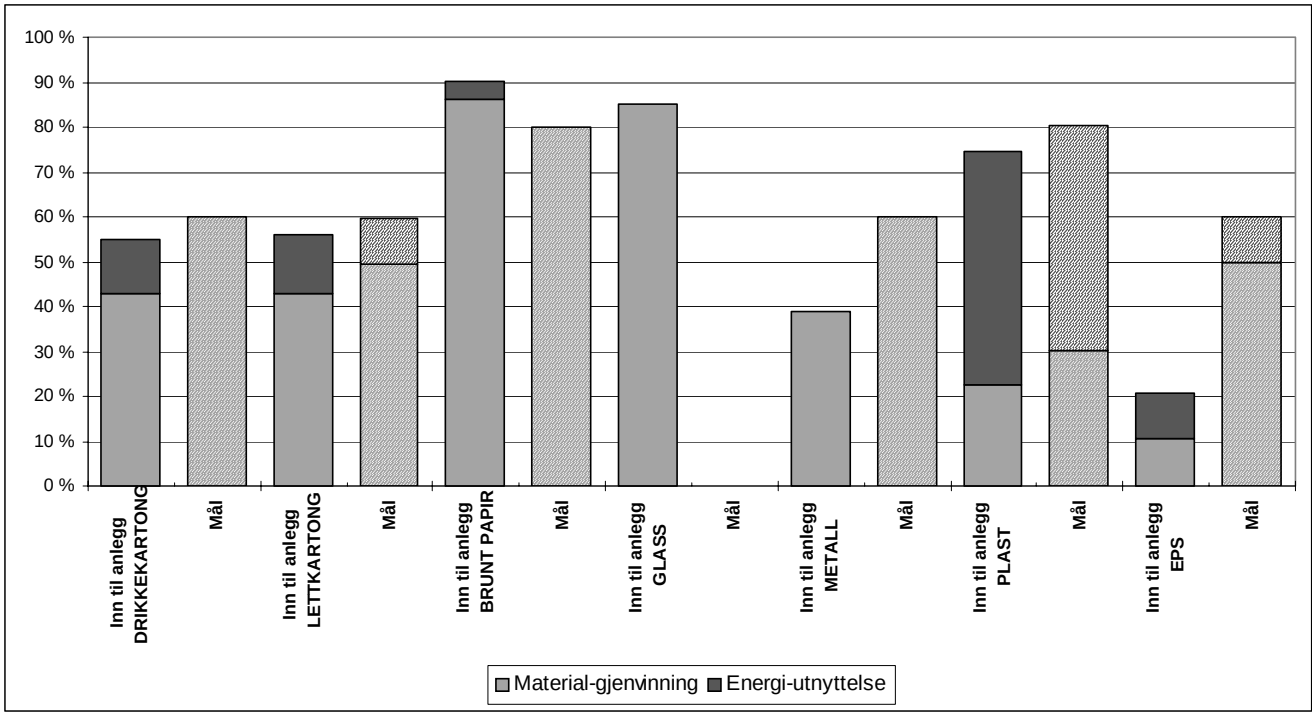
and the proportion of waste recovered is also high for the fractions glass, beverage cartons and folded carton.

- Further effort is needed as regards waste reduction measures.
- There does not appear to be any need for fundamental changes in the agreements. Nevertheless, the need for minor adjustments and editorial changes should be considered.
- The statistics on packaging waste and waste recovery must be improved.
- The requirements for reporting according to the agreements on packaging and packaging waste should be better co-ordinated with the reporting required in accordance with other agreements and legislation.

The 1998 report did not include an evaluation of the targets specified in the agreements, but reviewed whether the obligations set out in them were being followed up. In this report, we have not considered further those obligations that were clearly identified as having been met in the previous evaluation.

The results for 1999 as reported by the packaging industry are shown in the figure below:

Figure 1: Results reported for 1999. Based on quantities collected, i.e. not corrected for degree of utilisation of waste collected (figures were corrected for this in the Norwegian Pollution Control Authority's evaluation)



Source: Report of 31 March 2000 from the PROs to the Norwegian Pollution Control Authority on quantities of packaging waste collected in 1999

The EU directive on packaging and packaging waste requires the recovery of at least 50% of all packaging waste, and recycling (material recovery) of at least 25% of all packaging waste, by 2001. In addition, at least 15% of each type of packaging waste is to be recycled. If the EU system for classification of packaging materials is followed, Norway had achieved the targets for the relevant materials in 1999.

The EU directive also specified maximum percentages for the recovery of various types of packaging. The current collection and recovery schemes mean that Norway has already exceeded several of these. A separate report on this has been drawn up and submitted to the EFTA Surveillance Authority (ESA).

The user surveys that have been carried out, mainly for private households, show that willingness to sort packaging waste is high. For households, the main reason for this is a desire to do something to improve the environment, whereas in the business sector the main reason is economic gain.

The results of the surveys carried out in 1999 show how much people know about the various schemes for sorting waste and what reasons they have for sorting their waste (*Feedback Research, Undersøkelse om kildesortering, 1999* (Survey of waste sorting at source, commissioned by the Ministry of the Environment).

Table 1: Survey of schemes for sorting waste at source (Feedback Research, 1999)

	Beverage cartons	Brown paper/folded carton*	Glass	Metal	Plastic
Schemes used during the past year	42-56%	89-95%	74-92%	24-81%	45-85%
Fraction it is most important to sort	3%	12%	45%	22%	21%

* No distinction was made between brown paper and folded carton in the survey.

The support from households is reflected in the number of municipalities that take part in the collection schemes. The example below, which shows figures for beverage cartons, indicates that the producer responsibility organisations (PROs) have achieved a great deal of support in the municipalities, even though the municipalities are not one of the parties to the agreements.

Table 2: Number of municipalities which have agreements with Norsk Returkartong on the collection of beverage cartons

	1994	1995	1996	1997	1998	1999
Number of municipalities	20	196	80	357	358	402

(Annual report for 1998 published on the Internet, pers.comm. Sveinar Kildal/Norsk Returkartong, 2 May 2000)

It is of crucial importance for the long-term success of the agreements that they have the support of industries in the packaging chain. Without this, it will be very difficult to maintain industry loyalty to the agreements. The level of support varies from one PRO to another, but they are also at different stages of development. Support from the business sector is growing. Important reasons for this appear to be the work being done by the PROs, the establishment of a joint system for collecting fees for participation in the collection system established by the PROs through the company Materialretur AS, and the fact that the company is licensed to approve the use of the Green Dot trademark in Norway.

2.2 Are the agreements effective policy instruments?

As regards packaging waste, the main policy instrument Norway uses to reduce waste generation and ensure waste recovery is the producer responsibility, a principle that was already established but has been formalised through the agreements between the Ministry of the Environment and the packaging

industry. The agreements can be regarded as indirect policy instruments. When evaluating the use of policy instruments, it is common to consider their management efficiency, cost-effectiveness and dynamic efficiency.

Our conclusion is that the **management efficiency** of the agreements has been high. Through the agreements, the authorities have been able to ensure that operators in the packaging industry have taken joint responsibility for achieving the targets. Even though the targets have not yet been met in full, substantial results have been achieved in only a few years, and we are now very close to achieving waste collection and recovery targets fully for all relevant fractions.

Other factors have also helped to achieve these results, and we would particularly like to mention the following:

- Political signals about the responsibility of the business sector and the threat that the state may introduce taxes.
- The fact that co-operation between the PROs and the municipalities has gradually gathered headway.
- The importance of other related policy instruments such as the Pollution Control Act, the tax on final treatment of waste and relevant regulations.

We also conclude that there is evidence that the agreements are **cost-effective**. The business sector itself is responsible for achieving the targets, and is obviously interested in keeping the costs as low as possible. However, this does not mean that there is no room for improvement. In this connection, we would like to point out that it takes time to establish a new system properly, and that this applies both to the physical establishment of the system itself and to bringing about the necessary changes in attitudes and behaviour. Once this process has been completed, the level of cost effectiveness may improve. Growing support from the business sector (with fewer ”free riders”) will have a similar effect.

We also conclude that the agreements make it possible to achieve a high level of **dynamic efficiency**. Stiff competition between economic operators in itself makes dynamic efficiency essential in relation to product development, economy and environmental issues. The environmental authorities and the business sector often share the same interests in this respect. Several of the measures published by the *Styringskomitéen for reduksjon av emballasjeavfall* (packaging waste minimisation committee) show both financial benefits and a reduction of the environmental impact, often through a reduction in the use of materials. Nevertheless, in our view a number of measures to optimise all phases of the packaging life cycle, improve transport efficiency and develop new products based on recycled raw materials would probably never have been implemented if the agreements on packaging and packaging waste had not existed.

The agreements set out detailed targets for relatively narrow sectors of the waste stream. At the same time, the ”correctness” of the target figures is influenced by many factors that fall outside the scope of waste management policy. This means that the target figures may be poorly adjusted if it is not possible to alter them from time to time. However, the uncertainty of the underlying data is so high that there is little reason to adjust the target figures frequently if we are reasonably sure that they are resulting in the desired trends. In our view, the provisions on evaluation and review of the agreements are sufficient to meet the requirement for dynamic efficiency.

In our view, the PROs now have at their disposal the most important instruments and measures that can be used to continue the development of the recovery schemes and ensure that the targets for packaging waste are achieved. Measures to ensure those economic operators in the packaging sector support the recovery schemes need to be further developed. Their development has been started by means of co-operation between the PROs. This is also in accordance with the principle of producer responsibility.

2.3 Waste reduction

In addition to the operational targets for collection and recovery, the agreements include requirements for waste reduction. These are not quantitative, and the social cost-benefit analysis is therefore restricted to an evaluation of the targets for collection and recovery. We have therefore evaluated the provisions of the agreements relating to waste reduction on a more general basis.

The agreements require figures for the waste reduction actually achieved and projections for subsequent years to be included in the annual reports. This has not been followed up by the packaging waste minimisation committee, which since 1998 has been charged with fulfilling the responsibility of the PROs to take steps to reduce waste generation. The Norwegian Pollution Control Authority is aware that it is difficult to obtain and report figures for waste reduction, and has therefore accepted reports of the measures actually implemented instead. The committee has also been developing a model for packaging development based on a special packaging index. At the same time, a training concept has been developed based on the idea of optimising all phases of the packaging life cycle rather than focusing entirely on reducing waste generation. In our view, revision of the agreements should be considered, so that they focus more on reducing resource use rather than only on reducing the quantity of packaging.

The fees for participation in the collection system paid to the PROs, like the more general measures they have implemented, act as an incentive for industry to reduce its consumption of packaging. Thus, the fees can be said to have an influence on the total quantities of packaging waste.

Although we recommend amendments to the text of the agreements as regards waste reduction, we are of the opinion that the wording of the agreements has helped to put waste and resource issues on the agenda among industries in the packaging chain. We would particularly like to mention the following points:

- It is unlikely that the activities that have been initiated by the packaging waste minimisation committee would have taken place if the issue had not been mentioned in the agreements.
- The agreements and the system whereby fees are paid according to the quantity of packaging used act as incentives to reduce the use of packaging.
- As regards optimisation of the packaging life cycle, both environmental and economic considerations generally indicate that we should aim for the same targets, *i.e.* reduction of resource use and the development of cost-effective solutions.

Nevertheless, it should be noted that it took some time before the industries in the packaging chains started work on waste reduction, as the Norwegian Pollution Control Authority has pointed out in its responses to the reports submitted by the packaging industry.

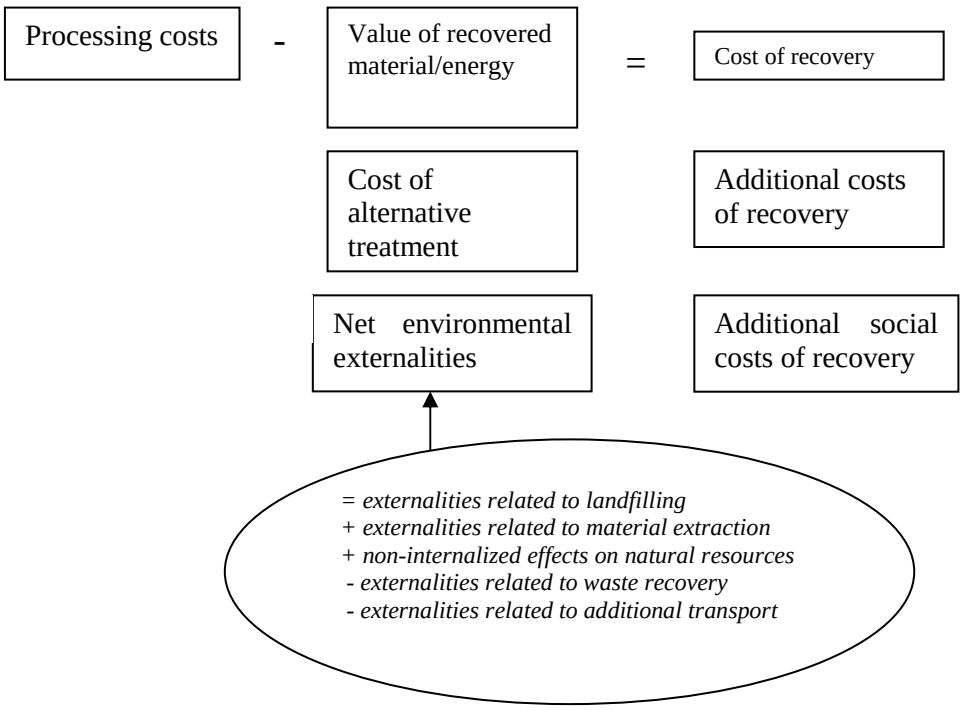
3. Social cost-benefit analysis

3.1 Analytical method

The social cost-benefit analysis is based on calculations of how much it costs Norwegian society to recover waste rather than disposing of it in some other way.

Both internal and external costs are included in the analysis. The figure below illustrates the principles we have followed:

Figure 2



3.2 Results of the cost-benefit calculations

The table below summarises the results of the cost-benefit calculations. The overall social benefits of achieving the operational targets of the agreements are estimated at just over NOK 600 million in 2000. However, this figure is based on a number of underlying assumptions with a high level of uncertainty.

Table 3: Cost-benefit cost calculations

	1996	**1997**	**1998**	**1999**	**2000**
Brown paper	-389 882	-379 894	-417 680	-395 708	-398 592
Plastic	-139 717	-108 001	-131 051	-183 642	-236 968
Folded carton	-11 126	10 689	-172	-7 120	-10 926
Glass	n.a.	n.a.	1 539	-2 529	-2 515
Beverage cartons	12 593	11 525	3 057	2 271	4 263
Metal	n.a.	n.a.	n.a.	30 446	41 255
Total	-528 133	-465 681	-544 307	-556 2829	-603 483

It can be seen that the system as a whole has generated substantial social benefits every year. These have been derived mainly from the recovery of brown paper. In addition, the recovery of plastic has generated considerable benefits throughout the period. This is mainly because energy recovery from plastic reduces emissions from alternative forms of energy production, and the estimated value of this reduction is very high. The relatively large differences between materials also reflect where the waste comes from and thus where the greatest efforts have been made to achieve the targets.

3.3 Sensitivity analyses

During our work on the cost-benefit analysis, we recognised that the results are particularly influenced by the following factors:

- The time costs of sorting
- Material and energy prices
- Estimates of environmental costs

Sensitivity analyses show that changes in these factors will of course influence unit costs and thus the results.

Time costs of sorting. Using Statistics Norway's estimates for the costs of sorting, we estimated that the overall social benefits would be reduced by 15% to about NOK 505 million.

Material and energy prices. An analysis based on changed material and energy prices for waste recovery indicated that the overall social benefits would be reduced by 10% to about NOK 551 million.

Environmental costs. The most uncertain estimates in our calculations are for environmental costs. We found that using ECON's lowest estimates instead of the best estimates reduced the overall social benefits by about 63% to about NOK 226 million.

However, it should be noted that none of these analyses indicated that the overall social benefits of NOK 600 million would be reduced so far as to become negative, *i.e.* a cost to society.

Quantitative targets for the various materials

If the various material types are considered separately, the analysis shows that the economy of the schemes and the levels of collection and recovery are good for plastic and brown paper, whereas the positive results for folded carton and glass are much less robust. For beverage cartons and metal, the results are negative, but not very significantly. The differences in the results largely reflect differences in where the waste is generated and the types of collection schemes that have been chosen. The results may be summarised as follows:

- **Plastic**. In 1999, there was still some way to go before the targets could be achieved fully. However, we conclude that gains in efficiency will make it possible to meet the targets in full in the reasonably near future, and in a way that continues to give social benefits.
- **Beverage cartons**. In 1999, the recovery rate12 for beverage cartons was 39%, whereas the target is 60%. Thus, there is still a long way to go before the targets are fully met. The immediate conclusion from the analyses, supported by the industry's own assessment, is that it may be difficult to achieve a positive figure for social benefits and at the same time achieve the targets fully. Beverage carton waste is mainly generated by and collected from private households. It will require a considerable effort to change people's attitudes, and perhaps also an improvement in municipal waste collection services, to increase the amount of waste beverage cartons collected for recovery..
- **Folded carton**. The targets in the agreements have almost been met for folded carton, but the industry considers that it may be difficult to achieve them fully (*i.e.* increase material recovery by a further 7 percentage points). The industry has estimated that the fees paid for participation

[12] The figure is corrected for waste delivered to recycling plants that is subsequently delivered directly to landfills.

in the collection system will have to be more than doubled in order to meet the targets fully. The large increase in costs may be needed because the marginal costs of the remaining increase in material recovery are higher, or the estimate may result from an assumption by the industry that the prices of recycled raw materials are generally dropping or be based on forecasts of trends in the costs of collection and recovery.

- **Brown paper**. For brown paper, the targets set out in the agreement have been exceeded. This might indicate that even more ambitious targets than the current 65% could be set for this waste fraction. However, it is important to remember that the market for corrugated paper is currently relatively strong, and that it may be sound policy to allow some leeway in case of changes. In addition, the costs of collection and transport may be high if the proportion of waste collected is to be increased from its present relatively high level. Finally, certain minimum standards must be met for the waste to be suitable for recovery.
- **Metal**. Since the system has only been properly operative since 1999, it is too early to evaluate whether the target of 60% recovery (compared with the current level of 37%) is sound in socio-economic terms.
- **Glass**. As mentioned before, there is no operational agreement for glass as there is for the other waste fractions discussed here. The current rate of recovery is very high (about 80%), and it is not considered realistic to increase this any further. This is particularly true because the quantities of relevant types of glass packaging waste are dropping. It may therefore become more expensive to maintain the current level of recovery, since the waste recovery systems will be dealing with a smaller volume of waste.

The analyses indicate there may also be reason to change the quantitative targets of the agreements on packaging and packaging waste. The PROs themselves have suggested certain corrections.

4. Proposals for amendments to the agreements

The agreements on packaging and packaging waste were signed in the period 1994-1995. The parties to the agreements are the Ministry of the Environment and various economic operators in the packaging chains.

The agreements were drawn up at a stage when we only had limited experience of this type of political instrument. Now that the agreements have been in operation for some years, more experience and understanding has been gained that can be used to improve the agreements. This report includes a discussion of the background and whether it is appropriate to make changes. We conclude that corrections or additions to the following aspects of the agreements should be considered:

- The targets for waste collection and recovery;
- The deadlines for meeting the targets;
- A changeover from requirements to reduce waste generation to requirements to optimise all phases of the packaging life cycle;
- Alterations to the wording of the agreements that will improve opportunities for co-operation on collection and recovery schemes. This might include combining agreements on different waste fractions;
- Clarification of how figures for waste quantities, waste recovery *etc*. are calculated (including the issue of energy recovery) and requirements to provide audited figures in reports;
- The distribution of responsibility between the authorities and the packaging industry as regards information.

IMPLEMENTATION OF EPR IN NORWAY: CASE STUDY ON PLASTIC PACKAGING AT NATIONAL, SECTORAL AND COMPANY LEVEL

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1. Introduction

This paper presents the extended producer responsibility (EPR) programme for plastic packaging in Norway. The main focus is on the industrial implementation after the signing of the covenant in 1995 (Norwegian Ministry of Environment 1995). The contracting parties of the covenant are, on the one side, the Norwegian Ministry of Environment and, on the other, representatives from producers, fillers and packers, retailers and grocery trades of plastic packaging. Plastic packaging is not the only EPR programme running in Norway. The first was a regulation for battery collection and recovery in 1990. This was followed up by a covenant on batteries in 1993, a covenant on liquid board packaging in May 1995, and similar covenants for fibre based packaging, glass packaging and metal packaging in September 1995. Finally, the covenant and regulation for EE products in 1998 and the covenant for rechargeable batteries in 2000, completes the list of EPR programmes in Norway.[13]

The EPR programme on plastic packaging is probably the most controversial scheme, because there has been a lot of disagreement concerning the level of the targets of recycling, whether energy recovery should be preferred to material recycling and also the costs of operating this programme (Bruvoll 1998, Hanssen 1998). Even so, the case of plastic packaging is regarded as representative for the schemes operating in Norway, because the other EPR programmes implemented in 1995 is quite similar as far as the way the covenants are formulated and in the way the industrial implementation is done.

This paper provides a description of the processes and consequences of the implementation of EPR in the plastic packaging sector in Norway. First, the theoretical background for studying EPR implementation is presented. Then, in section 3, a descriptive analysis of the operating EPR system is given, with obtained results from a governmental, a sectoral and a company perspective. In chapter 4 the results are discussed.

2. A theoretical background for studying EPR implementation

At its core, EPR is about transferring parts of the responsibility for materials and products in their end-of-life phase from municipalities (local authorities) to upstream companies that created the products, in order to reduce the negative environmental consequences from these products and materials. Both industry and central governmental authorities can take initiative to such responsibility transfer (OECD 2001). If companies themselves initiate EPR strategies, without any direct influence from authorities, the voluntary practice is then a part of the company strategy, driven by the market and/or the “shadow of the law”. These companies usually offer take-back systems for reuse and recycling of their products to the consumers. The well-known case of Xerox is an example of this. EPR on plastic packaging in Norway is an example of a governmental-initiated EPR strategy.

[13] All these covenants and regulations can be found at http://odin.dep.no/md/norsk/regelverk/index-b-n-a.html

2.1 A natural resource perspective

Human activity depends on natural resources, and these influence each other through interaction. So-called environmental problems are, in our opinion, in fact environmental *changes* that may cause problems for humans to carry out activities in order to achieve or maintain a certain level of welfare. Hence, there is always a trade-off between human welfare and natural welfare. Such trade-offs are based on human values and norms, which may not be integrated into the market mechanisms. If not, market failures arise. A governmental-initiated EPR is, like other governmental policies, a strategy for correcting such market failures relative to political and societal aims. Through governmental EPR, industry is given an extended environmental responsibility for their activities. But what actual environmental problems are EPR intended to solve? What are the market failures in the context of EPR?

A more limited answer is that EPR is designed to reduce the environmental effects of waste[14] in the end-of-life phase, by internalising environmental externalities and the costs of waste handling into the product prices. The amount of waste is, however, a consequence of earlier actions in the life cycle, before it becomes waste. A broader answer to the question stated above is therefore that EPR is also about reducing the total environmental consequences of a product/service in a life cycle perspective (Røine et al. 2000). In this perspective it is necessary to regard the coherence between the biosphere and the *technosphere*, the management of resources in the biosphere and of the resources already "imported" from biosphere to the *technosphere.*

Figure 1: Relation between biosphere and technosphere

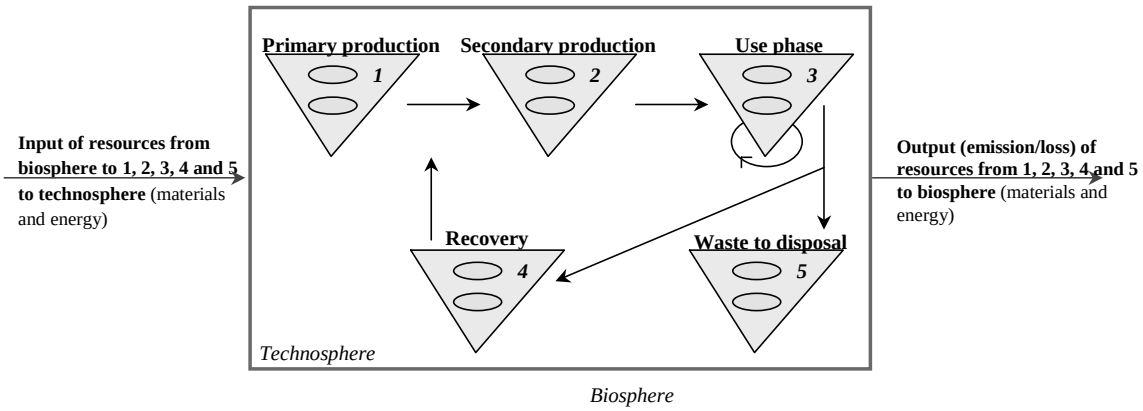


Figure 1 shows a system where both renewable and non-renewable natural resources are input to the *technosphere*.[15] These resources must be managed according to the total amount available (non-renewable) and the interests of the natural capital (renewable). Furthermore, there are emissions from the system to the biosphere that have effects on the recipients. These emissions can also be regarded as resources that must be managed with care. The emissions may have consequences on a local, national and

14 A product that is not needed anymore in its present form, is usually regarded as waste. But what if other people need it, is it then also waste? Is it waste if it is reused in the use phase? The last definition of waste is found in White Paper 44/1991-92 to the Norwegian Parliament: "waste is discarded movable properties or substances. Waste is also regarded as redundant moveable properties from tertiary sector, from production and treatment plants. Waste water and waste gas is not considered as waste" (Norwegian Ministry of Environment 1992).

15 Figure 1 shows the relation between biosphere and technosphere, but it also goes for smaller systems, like a sector or a company.

global level, and the effects are dependent on the quantity and the quality of the emissions, and must not exceed the carrying capacity of the recipients[16].

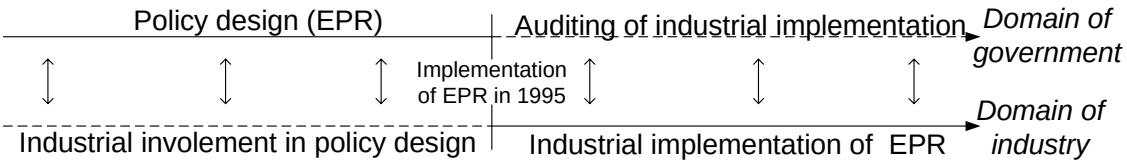
As mentioned above, there is always a trade-off between human welfare and natural welfare. The overall goal is to minimise the impact on these resources throughout the entire life cycle given that a need shall be fulfilled. This can be done by minimising the input of resources from the biosphere, and by utilising the resources as much as possible once they are imported to the system. Keeping the materials available within the system as long as possible is both energy- and material demanding, and hence there is, again, also a trade-off between the gain of keeping the material within the system and the cost of using energy and resources to do this. As Figure 1 shows, material recycling will keep the materials available within the system for a longer period of time. This will reduce the emissions to the recipients and reduce input of resources from the biosphere. Energy recovery will also result in reduced input from biosphere and reduced emissions to the recipients. By increasing the material and energy recovery, the relative amount of waste will decrease.

Since zero emission is unthinkable from human activities, it is necessary to find the level of amount of waste that result in the lowest environmental load for satisfying a particular need. This is somewhat different from maximising the reduction of waste in general. Due to problem-shifting, there should be a life cycle perspective indicating that the entire environmental load from the system, and not only the amount of waste, should be as small as possible. However, all products will sooner or later become waste that will have environmental consequences due to emissions. This may eventually cause problems for humans. The aim is to make more products and material useful for a longer period of time. Further, when the waste first has come into being, this waste should be treated in the most eco-efficient way.

2.2 Governmental policy design and the implementation process

Governmental strategies and instruments constitute continuous framing conditions in which actions among different actors, like industry and individuals, take place. The implementation of these strategies and instruments, as can be seen from Figures 2 and 3, is not limited to the governmental policy design, but includes the actual processes of change within industry, individuals and other actors (organisations) as well.

Figure 2: The implementation includes policy design and processes of change within industry



EPR, being a strategy, is made operational through actual policy instruments, which ideally should give industry incentives and a certain amount of freedom to choose *their* own appropriate strategy

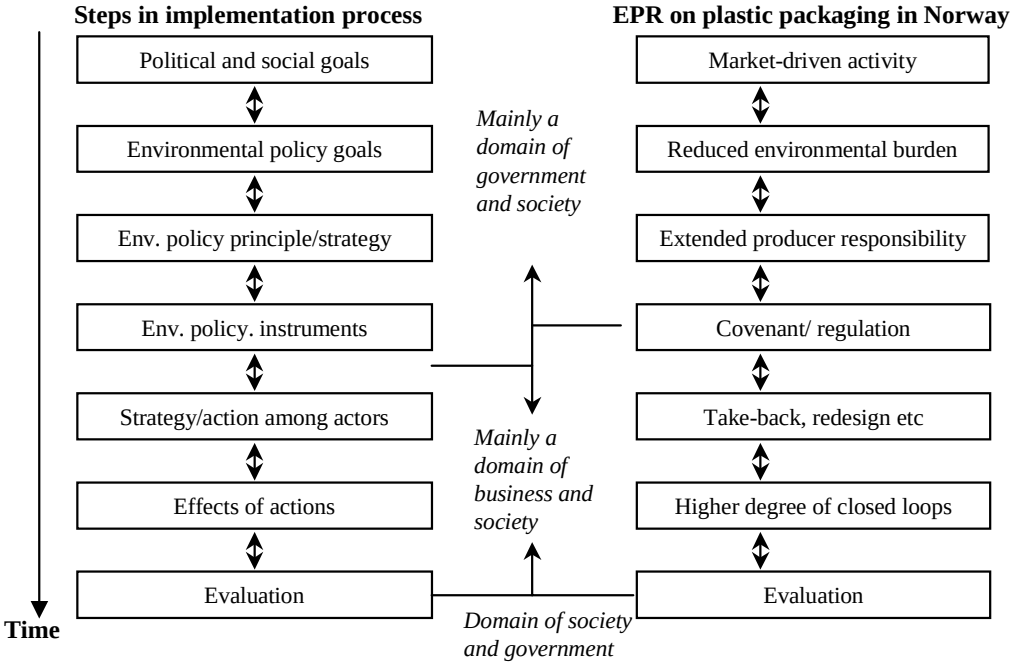
16 Ecological systems may be regarded as chemical solutions with buffer properties. Another way of looking at it, is to regard the situation with snow on the roof of a house. The house is standing unchanged even if more and more snow is loaded to the roof, but only until on point where everything collapses, making the house unrecognisable and the costs of repairing it very high.

to reach the political aims[17]. As mentioned above, we regard EPR in this paper as a governmental strategy with consequences for business, and *not* a business-driven strategy for meeting the shadow of the market.

Figure 3 below shows the relation between EPR and other terms in an implementation process. The figure includes both the domain of government and society and the domain of business. The left part is a description of an implementation process in general terms, while the right part gives an example from implementation of EPR for plastic packaging in Norway.

Starting from the top, the political goals, for example more market-based activities, lead ideally to certain environmental political goals, for example reduced environmental burden, reduced material throughput or reduced waste on landfill, which is then implemented through environmental policy strategies. EPR is an example of this. The strategy results in practical environmental policy instruments, for instance covenants or take-back legislation. Inherent in these instruments are different incentives for actors at business and individual level to implement strategies and actions. The private establishment and operation of take-back systems or product redesign are examples of this. Individual conscious purchase and sorting of waste at household are other examples. These actions may have certain effects, for example higher degree of closed loops. Finally, both the actions and effects at both business and individual level, as well as the entire political process at societal level, must be evaluated. Processes of change because of EPR happen both on national, sector and company level. The two-arrowed lines between the boxes in the figure indicate interaction between these boxes, and that the implementation process is indeed iterative with both top-down and bottom-up influences.

Figure 3: EPR related to political implementation process



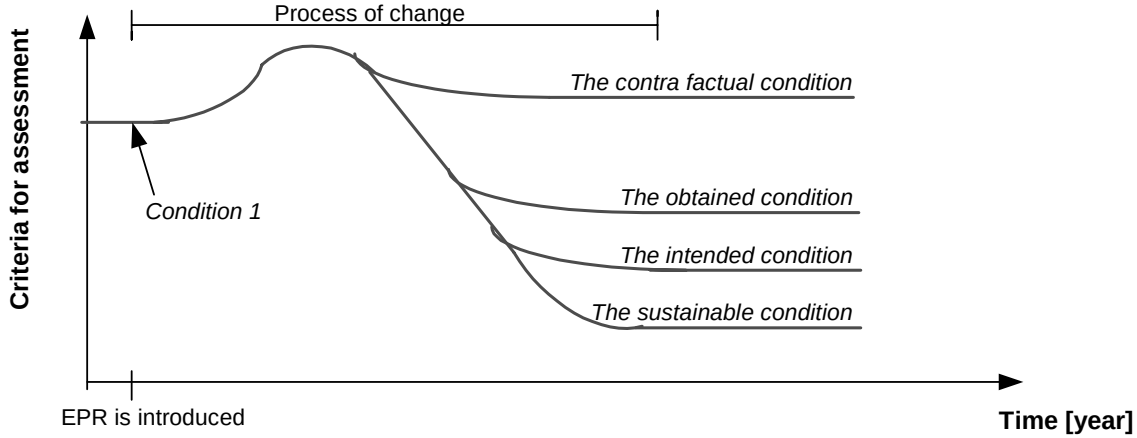
[17] This can be incentives for technological innovation, but also incentives for more fundamental changes, addressing questions like "what companies should make, what consumers should buy, and even whether consumers should own products, rather than, for example lease products, or buy product services (Ehrenfeld 1995).

EPR is just one of a number of forces that influence actions among actors, and "competes" with these other forces to carry out change. To study the implementation of EPR is then to study the processes of change that have occurred in the period of time when EPR has been into force. The role of EPR in these processes is then an expression of the *power* of EPR to initiate and carry out change.

2.3 Evaluation of EPR implementation

There are many ways of evaluating the implementation of EPR. Although it is theoretically possible to do an ex ante evaluation, it is far more valuable to base the evaluation on experience and empirical data on what have actually happened. Every evaluation needs, however, a point of reference, a base case, to be able to analyse and discuss the results. Figure 4 below shows that the evaluation can be done by comparing the actually obtained condition with the intended condition. It can also be compared with a sustainable condition. This is far more difficult since nobody really knows what a sustainable condition looks like. However, the emerging concept of industrial ecology may provide some guidelines on what may characterise this condition. It is nevertheless not possible to scientifically prove this (Ehrenfeld 2000). A third possible way of evaluation is to use the starting point (condition 1 in Figure 4) as the base case, in order to see the actual changes that have occurred.

Figure 4: The process of change and the evaluation alternative



Another way of evaluating the EPR implementation is to study the *processes* that have led to the new condition[18]. Getting insight to the reasons why and how new conditions have appeared can achieve valuable knowledge on social and corporate mechanisms. Common for both a "condition" evaluation and a "mechanism" evaluation is the need for indicators. Which indicators can describe the condition and which can describe the mechanisms? The choice of evaluation depends on the chosen perspective and what objects and actors in the system the study will focus on.

OECD has developed 5 evaluation criteria (OECD 2001). These are 1) environmental effectiveness, 2) economic efficiency, 3) political acceptability, 4) administrability and 5) innovative advancement. All these criteria must be operationalised through the use of indicators. Lindhqvist (2000) has suggested two indicators that we will characterise under the label environmental effectiveness; i) collection and ii) recycling. These are condition indicators. His third indicator, "Design for

[18] In chemical engineering terminology, the conditions in Figure 4 correspond to a steady state condition, while the process of change corresponds to the reaction mechanism in chemical reactions.

Environment", can be regarded as a mechanism indicator combining the first ("environmental effectiveness") and the fifth ("innovative advancement") OECD criteria.

Norwegian Ministry of Environment (2000) employed a cost benefit analysis to evaluate the socio-economic costs and benefits of the systems that implementation of EPR has generated. This is quite similar to the second OECD-criteria ("economic efficiency"). Norwegian Ministry of Environment also carried out a more qualitative approach to evaluate EPR based on three different efficiency measures: goal efficiency, cost efficiency and dynamic efficiency.

In this paper we use both condition indicators and mechanism indicator. The former is referred to as results, while the latter is included in the discussions.

3. EPR implementation – Policy, processes and outcomes

Here we will look at the empirical basis and the results for the EPR implementation within plastic packaging. The implementation will be presented from a governmental perspective, an industrial sector perspective and a company perspective. The objective is to provide a descriptive "implementation history" as seen from these perspectives.

3.1 Governmental level

3.1.1 The context

Ministry of Environment started in the late 1980s and early 1990s to recognise the changed conditions for doing environmental policy design. This was due to the Brundtland-report and the subsequent activities for instance in the EU (leading to the EU directive on waste in 1994), the fact that environmental issues were a major part of the election campaign prior to the Parliament election in Norway in 1989 and that the environmental interest among people and politicians were significant (Aanestad 2000).

In this period there was a turn from visible and concrete environmental problems to many, small and diffuse emissions. It became more and more difficult to identify the direct causes of an environmental problem. There was a need for clarifying the responsibility of problems. Another argument was the recognition of the benefits of preventive actions to repairing, end-of-pipe actions. As far as the costs of waste management were concerned, these should be included as early as possible in the life cycle. This indicated a change in focus from waste managers to producers. The responsibility was given to those who have the best opportunity, knowledge and power to influence the environmental performance of the product, the upstream companies (Aanestad 2000).

The White Paper 44 (1991-92) (Norwegian Ministry of Environment 1992) first suggested more industrial responsibility on waste management. This was clearly influenced by the development elsewhere in Europe. It concerns environmental and resource problems related to waste, and opens up for the producers, and not only the waste holders (consumer/municipalities), to carry the costs of waste management. The packaging sector was selected as the first sector, mainly because of the amount of waste from this, the short lifetime of packaging products and the obligations from the forthcoming EU packaging directive. From the industrial point of view, the argument for signing the covenant was the threat of an alternative governmental instrument, namely taxes. The environmental tax was suggested in the Revised National Budget in 1994, and the packaging industry suggested for the Ministry of Environment to explore the possibilities of a producer responsibility instead of the far worse alternative of governmental tax. A working group consisting of governmental representatives and representatives from companies and trade organisations, started working on material flow analysis to get knowledge of the amount of plastic packaging circulating in society, being the basis for the targets in the covenant on plastic packaging.

A major argument in some European countries for increasing recycling and reducing amount of waste to disposals, leading to the introduction of EPR, were spatial problems. Norway does not to the same extend face such problems. The specific environmental problem from disposal sites in Norway was methane emissions to air and heavy metals emissions to soil. Two major objectives with introducing EPR were i) to reduce environmental burdens from products and waste in EoL-phase and ii) to clarify the responsibility to obtain this.

3.1.2 Some outcomes of the process

The major outcome of this process was the signing of the covenant between the Norwegian Ministry of Environment and representatives from the producers, retailers and grocery trades of plastic packaging in Norway. It was signed 14 September 1995 (Norwegian Ministry of Environment 1995), and is one of 5 covenants on packaging. There is no regulation for this sector. The covenant states that the producers should i) work for waste reduction and ii) build up a recovery system for plastic packaging with 50% energy recovery and 30% material recycling of all generated waste by the end of 1999. The covenant says further that the producers should establish a non-profit producer responsible organisation (PRO), *Plastretur*, and that this PRO should "develop, run, manage, monitor and organise collection and recovery of plastic packaging to meet the objectives of 50% energy recovery and 30% material recycling".

The responsibility of the Ministry of Environment was to provide statistical information on the amount of materials and public information on the EPR system.

One major result of the covenant was the establishment of a new recovery system for plastic packaging. As can be seen from the numbers in Chapter 3.2, the material recycling and energy recovery has increased steadily throughout the second half of the 1990s.

On a more general level, we have seen a decoupling between gross domestic product (GDP) and waste generation, although the total amount of waste to disposal is still rising. In 1974 the amount of waste pr capita in Norway was 174 kg, while it was 308 kg in 1998 (SSB 2000, Figure 8.2). In 1997 323 000 tons of plastic waste was generated, and 95 600 of this was plastic packaging waste. During the period from 1995 to 2000, the amount of plastic packing waste has been regarded constant, 95 600 tons per year. These numbers are most probably incorrect since all other indicators show an increase in waste generation.

From 1996 to 2000, the waste generation has increased with 5%, while the total GDP has increased with 10% in the same period.

During spring 2000 Norwegian Ministry of Environment carried out an evaluation of the 5 EPR programmes of packaging. The aim was to evaluate, by using a cost-benefit analysis, the level of the targets in the covenant, and to evaluate the usefulness and appropriateness of EPR as a policy instrument to reach political environmental objectives. The conclusion were that the socio-economic surplus was 200 million NOK, mainly due to the energy recovery, and that the target for material recycling had been two high due to high costs in collecting, sorting and recycling, particularly from households.

The goal efficiency, cost efficiency and dynamic efficiency was considered to be good compared to other policy alternatives.

3.2 Sector level

Although companies for some time had prepared themselves for the implementation of EPR, it can, for simplicity reasons, be said that the EPR implementation at sector level started with the signing of the covenant in September 1995. According to the agreement, the role of the government was reduced,

while the role of the industrial sector was increased (Figure 2). This chapter will discuss the system that the industrial sector itself established as a consequence of the covenant.

3.2.1 The context

The EPR system for plastic packaging can be defined as the actors throughout the life cycle of plastic packaging, their roles, the interaction between these actors through material and cash flows and the interaction between the actors and the flows in order to carry out the intended changes. Figure 5 below shows the actors and their relative influence on the actual material and cash flow.

A distinction is made between the direct and the indirect actors. The former refers to those actors directly contributing to the material, product and cash flows throughout the life cycle of plastic packaging. These are production companies, trading companies, packers and fillers, the industrial users of plastic packaging (aquaculture, agriculture, industry *etc*), private persons, collection and sorting companies and recovery companies, to mention the most important ones.

The indirect actors are those who organisationally, economically, or through research and regulations, are external factors that influence the material and cash flow throughout the life cycle. The most important indirect actors are Plastretur (PRO), Materialretur (PRO), Ministry of Environment, Norwegian Pollution Agency, the scientific communities and business organisations.

Figure 5: Direct and indirect actors in the EPR system of plastic packaging

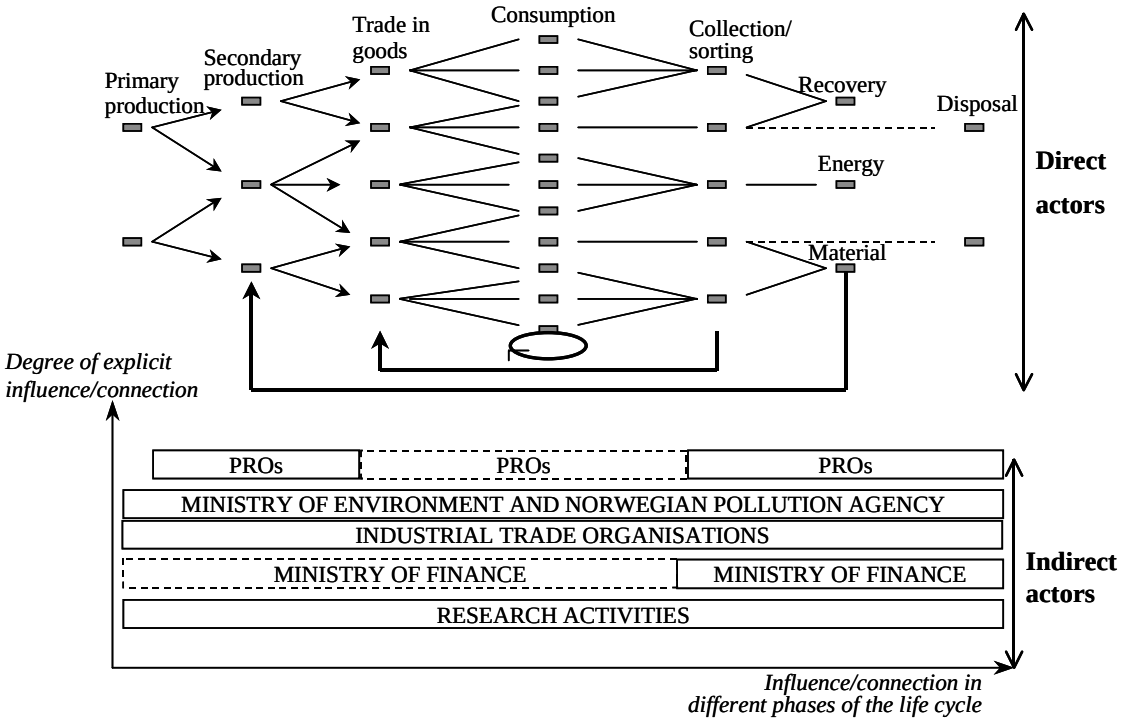
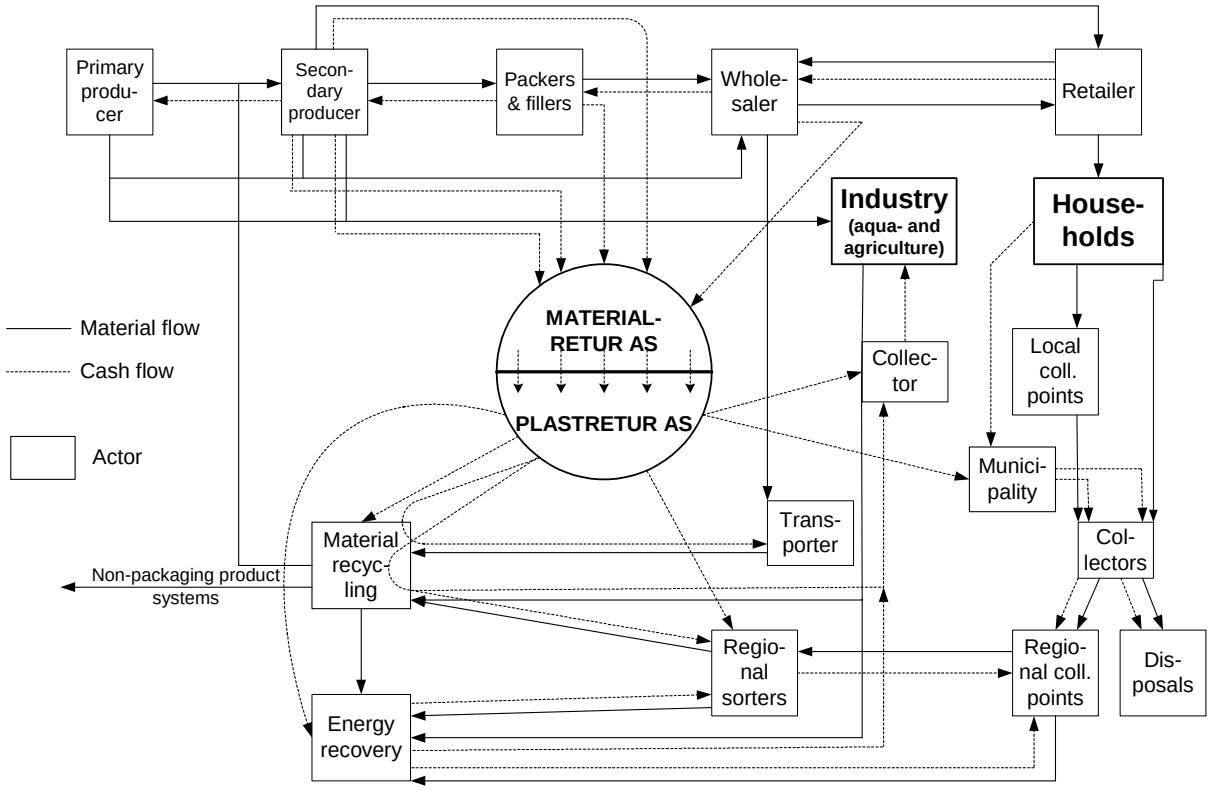


Figure 6 below shows the connection between the direct actors as far as the material, product and cash flows are concerned. This figure shows the flow of materials and cash between the different actors. The squares are the actors, the whole lines are material flows and the dotted lines are cash flows. The basic idea is that there is always a cash flow following a material flow, although it can be zero, that is for free. Usually it goes in the opposite direction. The figure also shows the role of Plastretur receiving money from

producers and packers and fillers, and distributing these to the actors in the recovery phase to encourage recovery activities. This EPR system is market-driven, with Plastretur as a catalyst for directing the cash, and thereby the material and product flows, in a wanted direction, and with the other actors competing on a regular basis to make money. This will be elaborated when discussing the role of the different actors.

The EPR system for plastic packaging is financed by the fee paid by producers of plastic packaging, by fillers and packers, by wholesalers and by importers. Retailers pay the fee for plastic bags. The fee is by some companies regarded as the same as a governmental fee, because both represent a cost, but in this case, the fee gets to the industry itself to organise a recovery system, and not to the government. The fee is at the moment NOK 1,70 (0,21 EURO) pr kilo. For plastic bags the fee is NOK 0,015 pr small bag and NOK 0,025 pr ordinary bag (Sundt 2000). The fee is paid to Materialretur, which is a financial coordinating company for all material companies like Plastretur. It was established in 1997, due to the potential synergetic effects in co-organising the fee collection and to reduce the number of free-riders. The total fee in 1999 paid to Materialretur from the 1070 Plastretur "companies" was NOK 84,7 million (10,7 million EURO). With 95.600 ton plastic packaging a year, the potential amount of fee paid could be NOK 162,3 million (20,3 million EURO). From 1st of January 2000 Materialretur is the only actor in Norway that has licence to use the "Grüne Punkt". Companies that do not pay the fee, is not allowed to use this certification, and Materialretur uses this actively to recruit new members (Guttuhaugen 2000).

Figure 6: Material and cash flow between Materialretur, Plastretur and direct actors



While Materialretur is concerned about the upper part of Figure 5, Plastretur is concerned about how to distribute the money to the recovery sector most efficiently. In 1999 NOK 58.2 million (7,3 million EURO) was spent on recovery, while more than NOK 10 millions were spent on information to new and old participants in the system. Plastretur aims at utilising the market forces by encouraging competition in all phases in order to make the recovery system as (cost-) effective as possible. Two major principles may

be put forth. Firstly, Plastretur has signed agreements with 95 collecting and sorting companies all over Norway, making these obliged to receive plastic packaging from industry, aquaculture and agriculture. These collectors/sorters are competing to make the best offer to the plastic packaging holder. Similarly, Plastretur has agreements with 4 regional sorting companies to receive plastic packaging from municipalities. Secondly, the quality of the collected and recovered material may vary quite a lot. Therefore, Plastretur subsidies for instance the sorters through the material recovery company, making this company a controller of the quality of the material delivered to them, and Plastretur is then able to pay different subsidies depending on the quality of the material.

Besides the financial support paid to collectors, sorters and recovery companies, Plastretur spends quite a lot of money on information and communication in order to recruit more member companies, establish co-operation with municipalities (400 out of 450 by the beginning of year 2001) and to make the recovery system more effective.

Below is a short description of the different actors in the EPR system of plastic packaging, as shown in Figure 6.

Plastic packaging originates from oil, and different qualities of plastics are made in the *primary production*; High-density polyethylene (HDPE), low-density polyethylene (LDPE), Polypropylene (PP), Polyvinyl chloride (PVC), expanded polyester (EPS) are the most important plastics for packaging.

The secondary producers are refining the primary plastic for making plastic packaging products, and some companies also use recovered material to make these products. The most important products are foil (film), bottles, PP-big bags, reusable packaging. Rosenlew, a plastic bag and foil producer, is for instance instructed by one of its customer, the Hakon-group, to make plastic bags out of a mixture of virgin and recovered material. Although there are technical problems doing this, Rosenlew is forced to do it in order to get its share of the market (Riksen 2000). These companies pay licence fee to Materialretur if they are producing building film, service packaging, agriculture plastic and plastic for market gardens and agricultural goods (Plastretur 2001). The fee is usually included in the price of the product.

The *packers and fillers* are those who use the plastic packaging for protecting the “real” product or for filling the “real” product into units. These users of the plastic packaging are those who basically shall pay the licence fee to Materialretur. As Figure 6 shows, they pay for the amount of packaging sold to the wholesalers.

The *wholesalers* are the link between the retailers and the packers and fillers. The wholesalers have mainly two tasks in this system. Firstly, they are co-operating with Materialretur giving a list of their suppliers who ought to pay the licence fee. Materialretur is then able to check if these suppliers (packers or fillers) have paid the fee, and if not Materialretur, and later the wholesaler, make a request to pay the licence fee. If the wholesaler is environmentally conscious, it has the power not to buy products from this company until the fee is paid (Nyås 2000). The wholesalers themselves pay a licence fee for the goods (with plastic packaging) they import to Norway.

Secondly, the wholesalers, for instance Norgesgruppen, are contributing to the collection of plastic packaging. Norgesgruppen collects the plastic waste in bags of 20 kg at the retailers, and gets NOK 32 per bag from the retailer. They transport this in return loads from the retailer. At Norgesgruppen, the plastic is pressed and balled into a 260-300 kg bale (1m*1m*2m), and these are sent either to a sorter who send it to Folldal Gjenvinning, or cars from Folldal Gjenvinning pick up the bales on their way back from Oslo to Folldal. In this way Norgesgruppen is competing with other collecting companies like Norsk Gjenvinning. Norgesgruppen gets NOK 1000 pr ton for this plastic waste.

The plastic waste at the *retailers* is usually of very good quality with small amount of dirt and impurities (as is the case with for instance foil from agriculture and households). The retailers must get rid of the plastic waste, and due to the finalisation tax it costs, for instance in Oslo, NOK 1,36 pr kg to dump it on the disposal sites. Including the transportation costs, it is then cheaper to pay the wholesaler to get rid of the plastic.

The *individual consumers* are not that much involved in the EPR system. There are very few incentives for them to sort packaging at source, and to wash the plastic to remove impurities. EPR is only inviting the environmental conscious people to act, not those who are acting mainly due to economical reasons.

Industrial consumers like companies within aquaculture, agriculture and industry in general, do not pay any licence fee to Materialretur, but they are the starting point of the collection of the plastic waste. Due to the finalisation tax, it has become more expensive for them to deliver the plastic to the waste disposal sites than to collectors/receivers/sorters of plastic packaging waste. The collectors/receivers are obliged to receive the plastic waste for free, but can charge the industrial consumer if they have to pick it up at the industrial sites. The plastic from this sector is usually very pure.

Plastretur has signed agreements with 95 *collectors/receivers/sorters* in Norway. They are paid, through the recovery companies, by Plastretur to do so, and the amount is depending on the quality of the plastic. The recovery companies are checking the quality. They get approximately NOK 1400 per ton.

The *municipalities* are not part of the covenant on plastic packaging, and quite many municipalities are without any influence from the covenant, but from the environmental policy in general, started to establish systems for recovery of different materials (Jensen 2000). There is now, however, a close co-operation between Plastretur and more than 400 municipalities. The municipalities are paid directly by Plastretur to create and distribute information material and for establishing collection points. They also receive NOK 1000 pr ton from Plastretur for plastic packaging going to material recycling through the regional sorting companies which have the quality control of the collected plastic. The regional sorting plants get NOK 2400 pr ton from Plastretur.

Municipalities select mainly between combustion or disposal of the rest fraction. Due to the finalisation tax, disposal has become more expensive. Some municipalities deliver the plastic waste of low quality to energy recovery, where plastic substitutes coal.

Recovered material of high quality is a main driver in the EPR system. If the quality is good enough, it is able to compete with virgin material in making new products. The basic idea in the Plastretur system is that the *material recovery companies* are able to demand high quality on the plastic material from the sorters because the material recovery companies receive money from Plastretur to pay to the sorters. The amount paid will depend on the quality. The material recovery companies and the sorters are guaranteed a minimum price from Plastretur. A material recovery company is receiving NOK 1850 pr ton as an average, and in addition it gets NOK 1400 pr ton to forward to the sorters. The demand for recycled material is higher than the supply.

The *energy recovery* of the rest fraction from household waste is mentioned above. This energy recovery counts for almost all the entire energy recovery in this EPR system (see Table 2 and 3). The energy recovery at industrial sites, gets plastic waste from the sorted plastic of low quality from households and from the industrial plastic waste of low quality.

3.2.2 Some outcomes of the process

Plastretur organises 4 return systems; for households, aquaculture, agriculture and industry in general. Further, the plastic packaging products are divided into 4 main product groups; foil ("soft" film of polyethylene), hard disposable packaging (for instance "hard" bottles and cans of polyethylene or polypropylene), PP-bag (not "hard" plastics) and reuseable packaging (for instance PET from soft drinks). In addition, Plastretur has from 1st of January 2000 included EPS (polystyrene) in its return systems. The amount of waste for these sectors and product groups are given in Table 1 below.

Table 1: Plastic packaging becoming waste in Norway a year (in tons) (Plastretur 2001)

	Households	Industry	Agriculture	Aquaculture	Total
Foil	32.500	22.200	5.200	1.500	61.400
Hard disposable packaging	18.700	4.000	500		23.200
PP-bag		2.000	800	1.200	4.000
Reusable packaging		7.000			7.000
Total	51.200	35.200	6.500	2.700	95.600

Table 2 below shows the recovery rates the last three years. As can be seen, material recycling and energy recovery is 8,5% and 5,2%, respectively, below the target in 2000.

Table 2: Recovery rates of plastic packaging the last 3 years (Plastretur 2001)

	1997		1998		1999		2000		Targets
	tons	%	tons	%	tons	%	tons	%	%
Material recycling	7.170	7,5	14.722	15,4	17.208	18,0	20.593	21,5	30,0
Energy recovery	34.416	36,0	36.615	38,3	38.240	40,0	42.788	44,8	50,0
Total recovered	41.586	43,5	51.337	53,7	55.448	58,0	63.381	66,3	80,0

So far in 2001, the material recycling is 22% and the energy recovery is 57%.

As far as waste reduction is concerned, this is far more difficult to measure. The sector argues that packaging optimisation is the better terminology to use for this. The "Steering Committee Group for Waste Reduction", which consists of members from different companies along the packaging value chain, has carried out a project on "material efficiency". This is defined as kilogram packaging pr net sales. The study concludes that this factor has been reduced from 2,45 in 1996 to 1,8 in 2000 for the packaging materials fibre, plastics and metals. The most important reduction is for fibre from 1996 to 1997. As for plastics, there has been an increase in this factor from 1998 to 2000 of 36% (Hanssen et al. 2001).

The real benefit of material recycling is that it is possible to reuse the material many times. The experience so far is that there is no problem in selling the recycled material. The demand for such material is higher than the supply. The main products with recycled materials, are carrier bags and refuse bags, or in other non-packaging product systems.

The collection from industry, agriculture and aquaculture is quite high, In 1999, 19780 tons out of a potential of 35.200 were collected from industry, while 4570 and 1830 tons out of a potential of 6500 and 2700, were collected from agriculture and aquaculture, respectively.

Collection, sorting and recycling from household is not that good. Eik et al. (2001) shows that of a potential of 1875 tons in the municipality of Trondheim in Norway, only 7,8% is material recycled. Similar studies in other municipalities conclude along the same lines. The sorting costs are very high for households waste, and a major problem is that cleaning and separation at source is very bad. Losses of efficiency early in the recycling chain are very difficult to catch up with later in the chain.

Finally, the covenants on packaging have stimulated the relevant actors to form different discussion forums, meeting places where experiences and solutions are exchanged. Materialretur and of "Steering committee for waste reduction" are secondary effects of the primary meeting places.

3.3 The company level – The Milk company

Chapter 3.2 provided a description of what has happened at sector level mainly in the End-of-Life phase after introducing EPR in 1995. This chapter will discuss what has happened within "Milk", one of the biggest Norwegian food producing companies, after the introduction of EPR in 1995. This chapter will therefore serve as an example illustrating the relative significance and role of EPR in the overall decision-making processes in one upstream company. The selection of this company is due to its size (Milk is one of those paying the highest fee to Materialretur), to its apparently environmental profile and environmental raw material, and to the expectation that this company has the motivation to change their packaging routines. However, there are 1072 plastic packaging companies that pay fee to Materialretur, and we will therefore make a caution about generalising this empirical study of this single company to other companies.

This study is based on 11 in-depth interviews in Milk during autumn 2001.

3.3.1 The context

Milk is a co-operative company owned by 22.625 milk-producing small-unit farmers in Norway. Milk consists of 10 independent dairies companies with altogether 76 diary processing plants and a 100% Milk-owned coordinating company, called MilkCo hereafter. The role of the dairies is to collect and process the milk into a wide spectre of products, while MilkCo is coordinating, supervising, impelling these diaries and doing product and process development, in addition to marketing campaigns. The annual turnover in 2000 was 10,8 billion NOK (1,36 billion EURO). There are 4378 employees in Milk and 681 in MilkCo.

On the annual general meeting in March 2002, it is expected that Milk and MilkCo will merge into one company based on a traditional industrial group organisation where the group management has authority over the diaries and MilkCo.

The most important raw material is milk, having in 2000 an throughput of 1,54 billion litres cow milk and 20,6 million litres goat milk, producing main groups of dairy products like milk, cheese, yoghurt and butter. The market shares of Milk for these products in Norway are 98%, 85%, 88% and 98%, respectively. The large wholesalers and retailers in grocery in Norway are the major customer of Milk, in addition to typical service companies like hotels, airlines, restaurants and so on.

Until 1992, Milk had monopoly in producing and selling diary products. The monopoly on producing the raw material, milk, is still present. The milk consumption is decreasing in Norway, and one objective of Milk is to reduce the rate of decrease of the consumption. Another trend is that 90% of the processing plants, mainly the small one, have been shut down during the last 15 years, resulting in increased centralisation and longer transport distances.

The costs in Milk for 2000 is: Personal (30,9%), Packaging (24,2%), Transport (16,5%), Maintenance (6,8%), Administration (6,4%), Commercials (5,1%), Depreciation (7,3%) and Energy (2,8%). As can be seen from these numbers, packaging is a major cost for Milk, approximately 1,3 billion NOK in 2000 (164 million EURO). They paid 24 million NOK in fee for use of packaging to Materialretur, representing 1,8% of total packaging costs and 0,44% of total costs. The main packaging material is liquid carton (63%), cardboard (20%) and plastics (15%), on weight basis.

A public opinion poll measurement carried out by the Norwegian opinion-research institute MMI, has several years in a row rewarded Milk as the best environmental company in Norway. One major reason for this is said to be the fact that milk diary products are based on pure and healthy raw material, and Milk's identity and reputation is quite a lot related to this fact. Since Milk is in the food industry, careful attention to safe and hygienic production and packaging is an absolute necessary condition for the products. It is nevertheless in Milk's own interest that the environmental conditions remain good, and the company therefore needs a good environmental policy and implementation. There are anyhow some environmental problems related to the production of diary products, the emissions to water and the use of by-products being the two most important ones. In addition, the use of packaging is also an important environmental issue. 3 people work directly on environmental issues at MilkCo.

MilkCo consist of 5 departments. These are Economy/Logistics/Purchase, R&D, Market, International and Information/Organisation, in addition to the corporate management. MilkCo is responsible for product and process development. The company launches around 15 new major products a year. A product development group is formed with representatives from all the departments mentioned above, in addition to people from the relevant diary that will produce the product. The core task of the group is obvious; developing a popular product for the market to maximise the profit for the company. In doing this, a number of factors, in addition to the actual product, must be taken into account; the production process and the equipment and technology for this, the packaging to be used and the way it should be used for marketing, the logistics from production site to consumers, the potential environmental harm caused by the production process and the packaging, the costs of the production and the raw materials. These are just some the factors that must be considered. The final product will always become the result of balancing these different factors. Thus, the environmental issue is only one out of many factors.

Although Milk always has been a company with close connections to nature, the "industrial" environmental started when Milk experienced the increasing environmental pressure from the market and the opinion in the early 1990s. Environmental organisations and individuals constituted this pressure through media and direct contact, asking "difficult" questions about different environmental issues, particularly the lack of return systems for liquid cartons, and the use of too much packaging in yoghurt products. Milk was at a loss of good answers, and they decided consequently to start LCA studies in 1992 to get better knowledge of the environmental performance of their products, and particularly the packaging. This was at the same time as the White Paper on waste management, as mentioned previously, indicated a turn in the governmental attitude to waste giving more responsibility to industry.

An environmental employee was appointed, being responsible for packaging and environment. His work resulted in more LCAs, as collaboration between Milk and its packaging suppliers, analysing different alternatives for milk packaging. These LCAs were very important to how Milk reacted to the pressure from market. They also created a wish to do more, to be preventive, and in 1993 Milk contacted the Ministry of Environment (MD), with the intention of starting a working group elaborating on the issue of establishing a producer responsibility on liquid carton packaging. This was also because MD were talking louder and louder of a packaging tax on 1 NOK pr unit. If such a tax would pass through, this would mean an increase in Milk's costs of hundreds of millions of NOK. This was the starting point ending up with the establishment of Norsk Returkartong in May 1995.

More or less the same process started on plastic packaging in 1994. The environmental tax was suggested in the revised national budget in 1994, and the packaging industry, which would have been hard hit, suggested for MD to explore the possibilities of a producer responsibility instead of the far worse alternative of governmental tax. A working group consisting of governmental stuff and representatives from companies and trade organisations, started working on material flow analysis to get knowledge of the amount of plastic packaging circulating in society, being the basis for the targets in the covenant on plastic packaging. According to our informants in Milk, there was never any doubt on participation from the company. The main reason was, as mentioned above, the alternative of governmental tax.

3.3.2 Some outcomes of the process

First, we will provide some numbers for the development of key indicators related to packaging. Table 3 below shows the development in use of packaging from 1995 to 2000.

Table 3: Use of packaging from 1995 to 2000

Packaging material	*2000 [tons]*	*1999 [tons]*	*1998 [tons]*	*1997 [tons]*	*1995 [tons]*
Plastic	3.659	3.140	2.942	2.819	2.809
Metals	222	204	204	204	
Carton	215	236	364	677	
Cardboard	4.971	4.957	5.134	5.170	6.345
Liquid carton	15.356	15.763	16.636	17.474	19.975
Total	24.424	24.300	25.280	26.344	29.901
Net sales [1000 NOK]	10.391.621	10.250.307	10.467.384	10.250.254	10.250.450
Packaging/net sales [kg/ 1000 NOK]	2,31	2,37	2,41	2,57	2,85

The total use of packaging has been reduced with 18% over the last 5 years. The use of packaging seems to have stabilised in 1999 and 2000. As far as plastic packaging is concerned, the consumption seems to follow an increasing trend. The big jump from 1999 to 2000 is because 395 tons of transport packaging is included in the 2000 number, but not for the previous years. By using 3.264 tons as the 2000 number, there has been an increase of 16,2% in plastic packaging consumption the last 5 years.

The annual net sales have been rather stable, and due to reduced total amount of packaging, the factor packaging/ net sales is reduced from 2,85 [kg/1000 NOK] in 1995 to 2,31 in 2000. This is a reduction of 18.9%.

The total fee to Materialretur is 1,8% of total packaging costs and 0,44% of total costs. As for plastic packaging, Milk pays 6,2 million NOK (778.250 EURO), which is 0,11% of total costs and 0,47% of total packaging costs.

During the years 1996-1999, some packaging reducing efforts have been carried out. In Table 4 below the most important ones are listed.

Table 4: Some packaging reducing efforts

Year	Efforts	Reduction in ton pr year
1996	Removing bottom plate in goat cheese	33
	Change in lid in yoghurt-cup	39
1997	Reduction in liquid carton	425
	Removing of outer cover in 4-pack milk	392
	Weight reduction in 175 ml yoghurt	10
	Weight reduction in lid of yoghurt	26
1998	Reusable case for maturing of cheese	1093
1999	New yoghurt-packaging	87
		2085

Our informants accentuated three areas where substantial packaging reducing efforts has been carried out. First, the packaging of different types and sizes of yoghurt has gone through several improvement steps during the last ten years. Second, the reusable maturation cases for cheese have both resulted in less packaging, reduced costs and better quality (taste) of the cheese. This is an internal system for Milk. The third example is the new transport racks for milk that was developed in 1995. The milk cartons are in the same rack all the way from the diary to the consumers pick them up in groceries. This is an example of a new combined packaging and transport system, replacing another system that was less efficient.

Another result that is not about direct reduction in packaging, is the fact that Milk has, since 1996, published environmental reports, the last three years with major improvements in the number of indicators and the overall perspective. The environmental report is reviewed by an auditing company, which has suggested that Milk should develop a system for mapping and controlling their materials and energy flows, primarily within the diaries, but also although the value chain. This has resulted in a database and an environmental accounting system, where all the diaries shall update the database on a number of indicators concerning the production of diary products, of transportation, of the further use of by products and so on. The informants could report that this has created an increased interest in environmental issues, and at the same time a better knowledge of the process and product system they are a part of.

Finally, MilkCo contributes to and participates in different research projects in alliance with academic staff at universities, and they also participate in working and discussion groups within the branch.

4. Empirical results – a discussion

What are the results from the processes described regarding the objectives of the 3 actors and the role of EPR? Furthermore, what are the main barriers to successful implementation of EPR? We have, for structural reasons, divided the discussion into three subchapters; the governmental level, the sectoral level and the company level. However, these levels are indeed interconnected, and the points made in one subchapter are often relevant arguments in other subchapters as well.

4.1 Governmental level

In Chapter 3.1, we concluded that the objective of introducing EPR for plastic packaging in Norway was two-fold. First, environmental impacts from materials and products in end-of-life phase should be reduced. This should be achieved by i) increasing the amount of recovery and reducing the

amount of waste to disposal and ii) reducing the waste generation. Second, the intention was to clarify the responsibility of waste management.

If the discussion is limited to plastic packaging, the implementation of EPR has obviously increased the amount of recovered material. According to Table 2, the amount has steadily increased in the period (43,5% in 1997, 53,7% in 1998, 58% in 1999 and 66,3% in 2000). The increase is larger within industry than within households. The main reason for this is that industrial plastic packaging waste constitutes a much cleaner fraction than household waste, that the collection in industry is easier to organise by using return loads, and that the amount of waste is more concentrated.

Simple mass balance and the law of mass conservation (Lavoisier 1789, Kleijn 2000) shows us that increased recovery of material necessarily entails reduced amounts to landfills, at least in contra factual terms. In our case of plastic packaging, the generated amount of waste is considered to be constant, and the amount of waste to landfill is, also in absolute terms, reduced correspondingly. However, Statistics Norway operates with 140 000 tons of plastic packaging, which would indeed have dramatically reduced the achieved results. The introduction of finalisation tax in 1999 (NOK 300 per ton to landfill and to combustion without energy recovery), have, however, contributed to increased recycling and less to landfill.

It is argued by several that the costs of obtaining these results, are very high and not socio-economic beneficial for society (Bruvoll 1998, Bruvoll et al. 2000). This seems to be particularly valid for household waste (Eik et al 2001). On an aggregated level, the evaluation study done by Norwegian Ministry of Environment (2000), concludes that the plastic packaging system brings socio-economic benefits to the society. It seems that energy recovery is more beneficial than material recovery, particularly for the household waste. The conclusion is that the target of material recycling may be reduced. This will be an important argument in the renegotiation of the covenants during winter 2002.

Another result of the EPR implementation is that an entire new system is established. As for every new systems the costs in the construction phase is high and the efficiency is low. The fact that the system *is* there, and that this prepares for future increase in recovery, is in itself a positive result. As we will return to in Chapter 4.2, the major task is now to increase the efficiency in the system, which will make it less costly and with higher recovery rates.

One often forgotten argument in the recovery discussion is the point after the recovery; the reuse of the recycled material. There is no point in recycling if the material is not employed in a useful product and substituting virgin material. The question is then how the EPR programmes in Norway contribute to increase the demand for recycled material. As mentioned in Chapter 3.2, the demand for recycled plastic material is higher than the supply. Recycled plastic packaging is used in cloths, plastic packaging, office equipment and noise bafflers, to mention a few. But there is, however, nothing within the EPR programme that actually stimulates this. The EPR programme is first and foremost directed to the end-of-life phase, and to the upstream part of the value chain of plastic packaging. These are not necessarily the same companies that use or have the potential to use the recycled material. We will, however, add that two of the biggest customers of the material recycling company Folldal Gjenvinning are producers of plastic packaging. These have changed their technology now being able to produce with a mixture of virgin and recycled material. Most probably this is caused by the introduction of EPR, because without collection and recovery of plastic packaging in Norway, and the increased environmental consciousness this have caused, these companies would not have integrated recycled material in their production (Andersen 2001).

If we look at the society at large, the amount of waste has grown 5,9% from 1996 to 2000 according to Statistics Norway (Norwegian Ministry of Environment 2001). The industrial waste generation shows a flattening trend, while the household waste increases steadily. If these numbers are

analysed contra factual, it can be said that the increase in amount of waste to disposal has been reduced, despite the increased absolute amount of generated waste. The growth in GDP in the same period is 13,1%, which then indicates a decoupling of the growth in GDP and in waste generation. This is one of three objectives of Norwegian Waste policy stated in White Paper 24 (2000-2001) (MD 2001); "the growth in the amount of waste shall be significant lower than the growth in GDP". The second objective is that not more than 25% of total generated waste shall end up on landfills or being combusted without energy recovery by 2007. The recovery numbers for plastic packaging (Table 2) and also for other fraction where EPR is implemented, show a trend towards this objective. The third objective is that all hazardous waste shall be properly treated.

The other objective in the covenant is that the plastic packaging sector should work for waste reduction.[19] The evaluation by Norwegian Ministry of Environment (2000) and assessments by Norwegian Pollution Agency (1998, 2001) conclude that the covenant has not been effective in stimulating *waste reduction*. Although municipalities have established collecting and recycling systems, and the consumers seems to improve their source separation (Syversen 1999), EPR does not give any incentive for the consumer to reduce the waste generation. The amount of waste from households has increased from 237 kg in 1992 to 324 kg in 1999. EPR may stimulate the companies, through eco-design strategies and strategies by the retailer[20], to reduce the amount of waste the consumers bring home. But when the packaging already is in the households, there are no incentives within EPR to waste reduction. This may, however, be obtain through other policy instruments, for instance differentiated waste tax (Jensen 2000).

As far as waste reduction is concerned, it is a paradox that to achieve effective collecting and recovery systems, they are not only dependent on proper sorting in households, but also that the amount of material (packaging) is high and beyond a critical level. This is somewhat contrary to waste reduction. The question is whether this level is achievable in Norway due to our nature-given conditions.

From a governmental point of view, the covenant must be assessed in relation to the alternative policy instrument, for instance a governmental tax as proposed in the Revised National Budget in 1994. The study by Norwegian Ministry of Environment (2000) concludes that the covenant is cost effective, goal effective and dynamic effective. EPR is regarded as an important instrument to collect and recycle the waste. It also seems obvious that EPR must be combined with other instruments like finalisation tax, differentiated waste taxes for households and other general economical means that altogether contribute to human actions with less environmental impacts.

4.2 Sector level

The targets in the plastic packaging covenant are 30% material recycling and 50% energy recovery. In addition, the sector is committed to carry out waste reducing efforts. The success of Plastretur depends on to what extent and to what costs the targets are reached. There are no quantitative measures for waste reduction, and Plastretur gives this lower priority than the recovery task. The "Steering Committee Group for Waste Reduction", where PROs and the upstream companies participate, work specifically on this (Hanssen et al. 2001). Plastretur, although owned by the upstream plastic packaging companies, is mainly working in the end-of-life phase.

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19 In terms of definition, waste reduction can either be understood as reduced amount of materials and products to landfills, or it can be understood as reduced amount of materials in products (*e.g.* dematerialisation).

20 A large Norwegian grocery wholesaler, Norgesgruppen, has started a project on collecting plastic packaging in some of their stores. Low investments and easy to organise have proved this to be successful, with a potential profit of NOK 11,2 million if employed in all the stores of Norgesgruppen. See http://www.plastretur.no/pm1511.html for more information.

As the results presented in chapter 3 tell us, the targets for material recycling and energy recovery are not yet reached. An interesting question as seen from Plastretur's point of view is why is it so? What are the main factors, reasons and barriers for this? Where in the value chain are the major losses of efficiency?

Before discussing the barriers, it is important to note the significant role of Plastretur. This non-profit organisation is a kind of glue between industry and government by in fact working for both. Plastretur performs more or less the same type of work as the government does; spending income (fees/taxes) on non-profitable, but still important, areas in society. The physical and economical systems for collection and recycling are developed due to such "money transfer", with Plastretur as the coordinating, motivating, informing and "lubricating" actor. It does a task that no single profit-seeking company in plastic packaging sector in Norway would have had the capacity, neither economically nor administrable, to do alone. This is entire new compared to other political instruments, and very essential for a collective system to work.

As far as the upstream companies are concerned, their different roles seem to be important. The plastic industry is responsible for building up a recycling capacity. The fillers and packers are those who actually pay fee to Materialretur, while the retailers and wholesalers are responsible for controlling that their suppliers are paying the fee. They are then important in seeking for free riders. Free riders are reducing the efficiency within the system.

The major bottleneck in the recovery system is the sorting part, both in households and in central sorting plants (Sundt 2000). The material recyclers are quite sensitive to impurities in the "raw material" plastic waste. Even if there is an incentive through price mechanisms to obtain a good quality delivered to the material recycler, it seems difficult to obtain good results here. This is particularly true for household waste. The sorting is usually done manually, making this activity expensive, slow and not very precise (Eik et al 2001). However, municipalities that have a bringing system or a pure plastic fraction at curb side, experience higher recycling rates, than those that mix different material fractions into one curb, making it necessary to sort manually afterwards. Moreover, the household waste is usually dirty (for instance left-overs), which reduce the efficiency of the recovery system a lot. The reason for this may be that there are no incentives and motivating factor for source separation in households. The recycling systems do only appeal to the environmentally conscious inhabitants, those that morally argue that they have to source separate. For those who think pure economically, the new recycling system with source separation has only resulted in higher taxes in waste handling. Furthermore, the plastic packaging waste in households seems not to be properly marked so that it is obvious for the consumer that this is the kind of material that can go into the plastic curb and not into the curb for disposal or energy recovery. Through interviews with 15 different upstream plastic packaging companies, no one had done any effort to guide the consumer to correct sorting (Røine 2001). Finally, reports in media, uncovering that household-sorted plastic waste in some cases is energy recovered despite the sorting, do not motivate individuals to continue their sorting.

A final point is that industry represents fewer actors, and more plastic per actor (less entropy), making it more efficient (costs/ kg plastic), than for households. These are all arguments making plastic recycling from household less efficient and more costly, leading up to the conclusion in some studies that household waste should be combusted with energy recovery instead of recycled.

Another argument reducing the efficiency of material recycling is said to be the significant improvement of the energy recovery capacity has emerged, and some argue that this may have resulted in less material recycling (Hanssen et al. 2001). The defenders of strong energy recovery capacity rely on studies showing that material recycling is too costly and too energy demanding compared to energy recovery, particularly for household waste (Bruvoll et al.2000, Norwegian Ministry of Environment 2000). These also argue that energy recovery mainly substitutes disposals and combustion without energy

recovery, and not material recycling. It is, in a thermodynamic and a material cascading perspective (Sirkin 1993), important to note that in order to use the resources efficient, the resources should be degraded gradually in order to be able to be used several times for different purposes. Energy recovery does not support such a theory.

Obviously, some nature-given boundary conditions like long transport distances with narrow and bendy roads, few inhabitants, with low population density, makes it more difficult to achieve an efficient recycling system than for instance in more densely populated areas in Western Europe.

A critique to the EPR system for plastic packaging is that Plastretur and its owners seem to be exclusively absorbed by achieving the targets in the covenant, and not focusing on the upstream activities of the value chain. Most of the companies regard EPR just as another cost. As discussed before, the EPR system in Norway have resulted in just few new packaging solutions that go beyond the incremental improvements of dematerialisation. Our interviews show that this is almost a non-topic matter. One reason to this may be, as we will see in the next subsection, that the alternatives of action is quite limited due to technological and organisational lock-ins.

In concluding, despite all these barriers to an effective EPR system, both collection and recovery show an increasing trend, and the costs are decreasing. The industrial part of the system is running more or less by itself, and Plastretur will therefore focus more on municipalities and household waste. Finally, the ultimate goal of Plastretur is to eliminate itself, making the market mechanisms run this alone without any subsidies or coordinating efforts from a PRO.

4.3 Company level – the relative role of EPR

There are obviously many reasons why Milk has developed the way it has during the last 10 years, and there are both internal and external reasons for this. Although it is not easy to decide the causalities, we will in this chapter elaborate on the role of EPR to the observed strategies and actions, compared to other factors in the decision-making processes in the company. How significant and powerful is EPR to companies?

To be able to discuss the relative importance of EPR after 1995, it is necessary to have the major objective of Milk as starting point. This is to produce competitive products of high quality. The diary products are the major issue, while the packaging is one necessary condition for attracting consumers and for protecting the product. The consumer does not have a strong incentive for selecting the product with the most environmentally friendly packaging. Milk is obviously more concerned about the product than the packaging, and it is argued that the packaging will never be more than a factor supporting the main product.

The relative environmental load of the main diary product to the packaging is 1:10, meaning that spill of main products is far more environmentally necessary to avoid. The packaging must therefore be made in such a way that it maintains and protects the main product in a healthy and secure way. This is an argument for packaging optimisation, and not packaging minimisation. Within the area of packaging, EPR emerges just as an additional factor, making the decision-process even more complex. This is important to remember when studying the product development processes.

Maximising profits, both through increasing the income and through cost reductions and improving the efficiency, have always been, and will always be, the major task at Milk. This is traditional industrial way of thinking. Since packaging is a substantial cost, efforts to reduce the use of packaging, reducing the weight of packaging resulting for instance in reduced transport costs, have always been there.

At least two major arguments for focusing on cost reductions are suggested by our informants. First, the monopoly of Milk disappeared, and competition from other companies emphasised the need for cost reduction. Second, the subsidy from Ministry of Agriculture has been reduced in recent years, meaning that Milk must improve their efficiency in order to maintain the milk price pr litre to its owners, the farmers. This has also resulted in a cost-effective centralisation of production capacity, reducing the number of plants from 800 to 60 as it is now. Another way of explaining the centralisation is that the technology development has tended towards bigger, more expensive machines were the packaging is formed inside the filling machine, and this has resulted in centralisation due to fewer machines with higher capacity. This also reduces the transport costs of the packaging from packaging producer to Milk. However, the centralisation causes more transport since the distance from farmer to plant to consumer is longer. All the factors mentioned here contribute to cost reduction, and EPR has very little significance in these processes. The main point is that there are basic economical reasons for doing this, and environmental reasons are of secondary concern. “We are not selling environment, but products”, an informant said. Luckily, there is often win-win situations, and the efforts are both economical and environmental favourable for the company. “There is no problem fulfilling environmental goals when this at the same time reduces costs”, one informant said.

The informants do all agree that EPR provides incentives for reducing packaging due to the fee paid to Materialretur (NOK 6,2 million a year for plastic packaging. This fee is, however, only 1,8% of the total packaging cost. Thus, this incentive is much weaker than reducing the cost of purchasing packaging. This is why packaging reduction always has been a major task within Milk. The informants do also agree on that EPR do not provide any strong incentives for designing for EoL-phase. The cost of the collection and recycling system is mainly due to factors within the EoL-phase, the efficiencies in each step of the recycling, and for a single upstream company to make changes is not that relevant. Improvements in the design for recycling of the packaging are not “rewarded” with reduced fee, and there is then no incentive for doing so.

A major impression from the interviewed persons is that EPR influenced the company during the first couple of years. But the potential of significant packaging reductions are not there anymore. EPR do not provide any continuous incentive for efficiency improvements, which of course will be even less if the targets are reduced in the renegotiated covenant. Hence, the dynamic efficiency is low, which is opposite to the conclusion from Ministry of Environment (MD 2000). One reason for this is that Milk has expensive processing equipment and technology that prevents major changes from happening.

The informants say that EPR has played an important role in creating the systems for collection and recycling of plastic packaging, and that this is important according to the social responsibility of Milk and the environmental profile the company wants to express. It is said that the implementation of EPR has to some extend contributed to a generally increased environmental awareness within the company. At least this is true for the R&D section of Milk. Some secondary effects, partly due to EPR, can be observed, for instance participation in packaging based discussion and interest groups (“Steering Committee for Waste Reduction”), environmental reporting and database for mapping the material and energy flows in Milk. There are, however, several other factors than EPR that has contributed to this.

Some of the factors are the increased competition, economical reasons (reduced costs) with environmentally friendly consequences, the top ranking in MMI investigations, which seems to be more important for the “environmental” motivation than EPR, is important to keep, the need to avoid skeletons coming out of the cupboard since the company is regarded an environmentally conscious and responsible one, the pressure from different external actors like the market, NGOs, and a various pressure from the 19 different County Governors in Norway, and the use of LCAs (which primarily was a consequence of external pressure from market, media and environmental organisations), just to mention a few. Without

EPR nothing would have been done in the end-of-life phase, but packaging reduction by Milk would have happened anyway.

The informants say that Milk is an environmentally conscious company. The improvements done with the packaging for Yoghurt products are examples everybody uses as *the* example. To what extend this awareness actually is included in the product development processes is more uncertain. When it comes to decisions, hard facts count. There is an observed uncertainty on how the environmental awareness should be included and taken into account in practise. And if an LCA shows that one solution should be preferred to another, the most economical beneficial solution, in shorter or longer perspective, is always chosen. Another example is the centralisation process, which has been carried out, despite the fact that this increases the transport distances, and is not environmentally preferable. There are other arguments than environmental ones that are stronger and more powerful to that discussion.

It seems that there are other areas of Milk's activity than packaging that is of current environmental interest. These are now regarded as environmentally more important. This is for instance emission from diaries to water and the reuse of by-products to new, valuable products. The effects of EPR to these issues are very limited. It can be said that the implementation of EPR contributed to the environmental reporting, which again resulted in the advise from auditing company to develop a database for mapping the material and energy flows, which again have contributed to increased awareness in diaries to deal with for instance issues like emission to water and use of by-products. Nevertheless, governmental environmental regulations on water emissions and economical potential of by-products, are far the most important reasons for Milk to do anything in these areas.

These results show the same trend as results from 10 other upstream companies in the packaging plastic value chain (Røine 2001).

5. Summary

By concluding this paper, a description of the historical policies, processes and outcomes have been given. The results can be summarised in two major points.

First, the implementation of EPR has increased the amount of recovery significantly, due to the establishment of a recovery system which has some further potential for efficiency improvements. However, EPR is not a strong instrument as far as waste reduction is concerned.

Second, EPR has only to some extent influenced the activities within upstream companies. Other factors like economical, logistical and market arguments are far more important than EPR in daily activities.

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EXTENDED PRODUCER RESPONSIBILITY AS AN INSTRUMENT TO REDUCE PACKAGING WASTE: THE GERMAN EXPERIENCE

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1. Introduction

The legal framework for waste management in Germany is the Closed Substance Cycle and Waste Management Act of 1994. The Act has legally enshrined the re-orientation away from the "throw-away society" and to closed substance cycle waste management. The "avoidance-recycling-disposal" triad has been extended to cover the entire waste management sector.

Extended Producer Responsibility or Product Responsibility is the underlying principle. The aim is to increase resource productivity, which shall go along with the reduction of pollution and the reduction of waste. The instrument is making producers and retailers responsible for their products over the entire lifetime of these products – “from cradle to grave“.

2. Product Responsibility in the Packaging Ordinance

The Packaging Ordinance of 12 June 1991 was the prototype and the model example for this new waste management policy. The Ordinance was amended in 1998 after about seven years of experience with this new instrument. The Packaging Ordinance had huge impact in the field of packaging.

2.1 Objectives

The Ordinance aims at the following goals:

- clearly reducing the packaging mountain by avoidance, reuse and recycling;
- placing responsibility for the product disposal on those who manufacture these products and put them on the market;
- relieving the local communities of the burden of disposal tasks; and
- clearly promoting substance recycling.

2.2 Obligations

For this purpose comprehensive obligations were introduced on the acceptance of the return of packaging and on the levying of deposits. The Ordinance contains the following individual stipulations:

- Manufacturers and distributors have to take back transport packaging and arrange for their reuse or substance recycling;
- Consumers have the opportunity to leave secondary packaging behind in the shops. Distributors have to arrange for this so-called secondary packaging to be reused or recycled;
- Manufacturers and distributors of sales packaging have the choice between taking back and recycle the packaging materials themselves or to join a take back system which operates all over Germany and organises a take back system near to private households.

2.3 The Regulation Provides the Option for Dual Systems (The Green Dot)

The German Government did not want to prescribe the specific obligation to accept the return of used sales packaging in the shops themselves. Instead, we followed the principle of defining the goal but leaving it up to trade and industry to find their own way of achieving this goal.

For this reason, trade and industry was given the option of organising collection systems - independently of municipal waste disposal - which operate in the direct vicinity of the consumers themselves. This possibility was provided by the option for a so-called dual system. It was called dual because it is a scheme which operates side-by-side with traditional waste disposal provided by the local authorities.

Trade and industry seized this opportunity and established a private company: the Duales System Deutschland AG (DSD). For a scheme such as this the Packaging Ordinance provides specific quotas for recycling of the packaging wastes.

The costs met by DSD play an important role concerning the control of material flows. These costs are divided amongst the participants of the dual system. Therefore, licence fees are charged by DSD dependent on the kind of material and on weight (with an additional fee per item). The licence fees range from about 0.07 $/kg for glass packaging to about 1.50 $/kg for plastic packaging. The fees are meant to be an equivalent to the actual costs for collecting, sorting and recycling(/disposal). With these licence fees some external costs can be internalised.

The “Green Dot” was created by DSD as a label which shows that the product participates in the Dual system.

2.4 Recycling quotas

The recycling quotas were initially quite low but they have increased significantly since 1 July 1995. The Packaging Ordinance as it stands at the moment stipulates that at least 70% of all sales packaging put on the market has to be recycled in the field of tin plate, paper and cardboard, 60% in the field of plastics, aluminium and compounded materials and at least 75% in the fields of glass.

If these requirements are not met, the licence for this private enterprise collection system is revoked. If the licence for a dual system is revoked, the obligations contained in the Ordinance to accept returned packaging and to charge deposits will become applicable again after a transitional period of six months. This means that the distributors themselves will be responsible for accepting the returned packaging.

Companies that have not joined a dual system have to take back the packaging themselves and meet the same recycling requirements as dual systems.

3. Positive experience and results with the Packaging Ordinance

Ten years after the entry into force of the first Packaging Ordinance this policy has proved successful in several fields:

- Manufacturers have changed their packaging habits. Environmentally friendly disposal of packaging is a factor which is indeed taken into account during the production process and is also increasingly used as an advertising argument in competition.

- Due to the differences of the fees charged by the Dual System for different materials changes in the packaging market can be seen. Packaging has become lighter and smaller. Some packaging with higher licence fees (*i.e.* plastics, glass) has been replaced by packaging with lower fees (*i.e.* cardboard). Useless packaging disappeared.

- The use of packaging has been considerably reduced in Germany. In 2000 there were about 1.5 million tonnes less packaging than in 1991, the year the Packaging Ordinance entered into force.

- In the field of transport packaging we are witnessing a trend towards reusable packaging. Examples here is packaging for furniture, food, pharmaceutical products and bicycles.

- Industry has set up a nation-wide collection system for throw-away packaging and has increased its recycling capacities for all packaging material. Since 1993 the “Green Dot System“ brought more than 35 million tonnes of used packaging to recycling.

4. Negative Experience with the Packaging Ordinance

Despite the positive results with the Packaging Ordinance, there were some initial hurdles to overcome. Initially, a critical situation arose in the field of substance recycling of plastic packaging. Due to the collection zeal of the public, which was very much welcomed, the quantities collected were greater than the recycling capacities available. However, the situation is different now. New technologies emerged in areas where deficits were observed. In 1990 we had a recycling capacity of 20,000 tonnes. This capacity had increased to over 500,000 tonnes in 1996. Due to the European Union’s Packaging Directive most of the packaging material collected will be recycled in Germany. The much-criticised exports to far-away countries had to be stopped by the end of 1997. That is also a sort of control of materials but it is criticised under aspects of liberty of trade.

Talking about experiences it is also necessary to mention some problems for the Duales System Deutschland AG. In the initial phase there were some serious financial problems to be solved. The causes of the financial difficulties include:

a) "Free riders", that are firms which do not participate at the dual system but expect that consumer bring their packaging also in the collection bins of this system.

b) Very often the public also disposes of non-packaging substances via the dual system. The figure here averages beyond 20%, a fact which also contributes towards higher costs for which the system does not obtain any financial recompense.

Given these problems, retailers, the packaging industry and waste management companies together have joined with a considerable number of local authorities to take measures to stabilise the dual system. These efforts were successful. The situation was stabilised, particularly after the Amendment to the Packaging Ordinance in 1998. However, there are still significant problems caused by free riders.

5. The Amendment of 1998

One of the aims of the Amendment was to create a balance between those who participate in a dual system and those who want to organise the return and recycling of their packaging themselves. Therefore the amendment provided for equal requirements for these companies and for dual systems.

With regard to plastics, the total recovery quota to be met as of 1 January 1999 is 60 per cent, with a minimum share of 36 per cent required to go to material recycling. Another 24 per cent are to be consigned to material recycling, feedstock recycling or energy recovery.

Other quotas for recycling of sales packaging were largely maintained at their already ambitious levels (see Table 1)

Table 1: Recycling quotas of sales packaging

Material	**as of 1 January 1996**	**as of 1 January 1999**
Glass	70% (previously 72%)	75% (previously 72)
Tin	70% previously 72%)	70% (previously 72%)
Aluminium	50% (previously 72%)	60% (previously 72%)
Paper, Cardboard	60% (previously 64%)	70% (previously 64%)
Compounded Materials	50% (previously 64%)	60% (previously 64%)

Packaging from materials not subject to any specific recycling or recovery quotas is to be consigned to recycling, provided that this is technically feasible and economically reasonable. Packaging that is directly manufactured from renewable raw materials can be consigned to either recycling or energy recovery.

In order to contain the problem of “free-riding“, parties responsible for their own waste management who do not participate in a dual system at all or only for some of the packaging they place on the market will in future be required not only to accept the return of their packaging, as has been the case so far, but also to furnish proof of compliance with the various recycling and recovery quotas applicable to them, as under a dual system. For this purpose, these manufacturers or distributors will have to provide documentation specifying the quantities of packaging placed on the market by them, returned to them and recovered by them during the past year. Compliance with the requirements for accepting return of packaging and for recovering packaging materials has to be certified by an independent expert on the basis of this documentation. Any party that fails to meet the above-mentioned quotas is required to participate in a dual system scheme.

6. Lessons Learned

After about two years with the amended Packaging Ordinance we are able to identify several lessons we learned:

6.3 Clear targets

Governments have to set clear targets which are transparent enough and can be accepted by all the relevant social groups including industry, consumers, environmentalists and so on.

6.4 Addressing of responsibilities

It must be made clear, who is responsible for the used product which has become waste. The German experience shows there shall be one part of the product chain who carries the main responsibility, who is responsible for meeting the goals. This should be the one who has the greatest influence on product specifications.

6.5 Financial incentives

Internalisation of waste management costs provides for incentives to change product design. There is not just one single instrument for the internalisation but every instrument applied should work along the polluter pays principle with the polluter as the one in the product chain who has the biggest influence on product design.

6.6 Differentiation between materials

Differentiation according to the polluter pays principle will cause necessary changes. Incentives have to be given to change product design and material. Internalisation of waste management costs shall allow different solutions for the obliged. The different licence fees of the German Dual System have lead to structural changes: materials which cause high waste management cost (like plastics) were substituted by less costly materials like paper.

6.7 Consumer participation

EPR-schemes for waste occurring at private households (*i.e.* packaging, batteries) depend on participation of consumers. Therefore environmental awareness (long time process) and easy access to collecting and recycling systems (*i.e.* kerbside collection) are necessary. There shouldn't be hurdles for the consumer to participate. Bring (take) back obligations for consumers should only be chosen when there are urgent environmental problems *i.e.* through hazardous waste like batteries.

6.8 Use of Life Cycle Analysis

The use of LCA will increase acceptance and environmental benefits. The use of LCA can lead to improvement of products from an environmental point of view. Obligations should take this into account and government should react on LCA results.

6.9 Monitoring

Monitoring is the key to benefits. If there is no pressure to meet targets things will run smoothly but without achieving environmental goals. The experience in Germany proves that if there is a lack of control there often is a lack of results

DISCUSSANT COMMENTARY ON PAPERS FROM SESSION 1

DETAIL, DESIGN AND DELIBERATE ASSESSMENT: COMMENTS ON THE IMPLEMENTATION AND EVALUATION OF EPR

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1. Introduction

Now that extended producer responsibility (EPR) has been in place for nearly a decade in some countries, it is a welcome opportunity to review its implementation and assess its utility. Yet, as most analysts and decision makers active in the world of EPR recognize, it remains difficult to know the details of EPR programs, obtain data about the results of those programs and especially to compare results across programs. In many respects, this no different from other programs in the realm of integrated product policy (IPP) or waste management—or even environmental and public policy more generally. Assessment of IPP and waste management is bedevilled by problems of conflicting definitions, incommensurate boundaries and goals and data availability. Assessment of EPR is made more difficult to the extent that, by design, many aspects of it are in the hands of the private sector, making data even less accessible.

Nonetheless, the task of evaluation is, in part, informed by generic principles of good policy analysis. To be assessed effectively, EPR, like any other public policy, needs such familiar elements as effective monitoring and clarity of objectives. Further, the assessment needs to strike a balance between comprehensiveness and the cost and complexity of analysis. In light of the multi-dimensional nature of EPR—both in its design and programmatic objectives and in the multiplicity of environmental endpoints that motivate it more generally—that balance has not yet swung far enough in the direction of comprehensiveness.

2. Understanding the Details

Kjetil Røine and Helge Brattebø [1] of the Norwegian University of Science and Technology (NTNU) tackle this challenge by examining the application of EPR to waste plastics in Norway from three perspectives: the national government, the plastics industry as a whole and one firm directly affected by the EPR requirements. Their research is instructive both for what it reveals and what it does not. Their close analysis discloses that, despite an EPR system that was designed with an eye to the incentives it provides to participants (*e.g.*, to drive down costs and encourage increasing levels of plastics recovery), at the firm level, the EPR fees do not provide incentives for design for recyclability. And the EPR fees are too small to provide significant and ongoing incentives for increased waste reduction. In this respect, their analysis challenges the Norwegian government's assessment that the EPR scheme stimulates "dynamic efficiency."

Their description of the workings of the industry producer responsibility organisation (PRO) reminds the interested observer of how incredibly difficult it is to come to an understanding of the money flows in an EPR system. This is not a matter of idle curiosity—the incentives for the various actors in the EPR system cannot be ascertained without knowledge of what may be minutia of the system. The implications for EPR implementation and evaluation are twofold: (1) transparency down to the level of fine

details is needed if the actual policy-relevant incentives are to be grasped and (2) the need for this level of detail is in tension with the notion that EPR allows society to delegate the management of EOL tasks to industry with little concern for the operational particulars.

Kazuyoshi Okazawa [2] of the Japanese Ministry of the Environment provides an example of a very systematic description of the national use of EPR. As with the Norwegian case, the incentive effects are nonetheless hidden in the details despite a lucid presentation. It is no surprise that cross-national comparisons remain a daunting challenge.

3. Evaluation EPR's Impact on Eco-design

There are elements of the task of assessing EPR that are, however, not just matters of generic (good) policy analysis. Kees Veerman [3] of the Dutch Ministry of Housing, Spatial Planning and the Environment provides an excellent and provocative list of theses about the strengths and weaknesses of EPR based on the Dutch experience. These "9 theses" go to the core of the EPR [4] and are worthy of further discussion and even systematic examination vis-à-vis international experiences with EPR. Of particular interest is his claim that EPR is ill-suited to the stimulation of waste prevention and eco-design because (1) it is difficult to design EPR schemes that differentiate among products in ways that provide the appropriate incentives to upstream actors and (2) because the targets of eco-design should focus on the stage of the product life cycle that has the greatest environmental impact. That stage is often not end of life.

Mr. Veerman's view is in strong contrast with that of Mr. Schmidt of the German Ministry for the Environment, Nature Conservation and Nuclear Safety [5]. The German experience with the Packaging Ordinance and the Duales System Deutschland (DSD) indicates that incentives for eco-design can be created and, in particular, through vehicles such as differentiated fee systems. The DSD's fee system is conspicuous for the variety of categories that it employs to allocate the costs of its activities, and therefore, for the incentives that it generates. What remains an open question in the case of the German use of EPR in packaging is not the possibility of achieving the desired goals, but the resulting cost-benefit ratio. The DSD is a work in progress. Significant programmatic changes have been made several times. There is no reason to think that the process of adjustment will not continue. A critical question of implementation is how much further the DSD can drive down its costs: What will the cost-benefit ratio be when all of the core efficiencies are realised?

Thus, like the German government, I am more sanguine about the possibility of designing EPR systems with appropriate incentives for eco-design. I am also more confident about the pursuit of design for end-of-life in a manner that does not have to confound the opportunities for optimising the environmental performance of products in other life-cycle stages. Nonetheless, given the centrality of eco-design to the motivation for EPR, I think that Mr. Veerman's claim is worthy of further investigation. In addition, I especially think that cost-benefit analysis of the different EPR systems remains a critical element in evaluation, despite all the challenges outlined by Michael Sturges of PIRA [6]. The question of the efficacy of EPR in encouraging eco-design also implies that cost-benefit analysis needs to be attentive to this issue. Evaluations should be conducted in a timeframe that reflects the length of product cycles. Significant levels of new design are unlikely to emerge faster than the typical length of time it takes for new product development industry-wide. Further, methods need to be borrowed from allied arenas of policy analysis to assess the incidence of product innovation. EPR must move beyond anecdotal evidence in this critical dimension.

4. Institutionalising Monitoring and Evaluation

In light of the paucity of good data on the performance of EPR programs, it is worth considering greater efforts at the *institutionalisation* of data collection and evaluation from the beginning of EPR programs. Clearly, EPR programs are often born in a political maelstrom, making both proponents and opponents less focussed on systematic, *ex ante* policy design for evaluation—rather than the details of EPR programs that are likely to increase or decrease its direct impact on the relevant constituencies. Nonetheless, more ambitious attempts at evaluation, including overt policy experimentation, using, say, intentionally varied program designs across jurisdictions to generate comparative data, might be valuable. It is worth remembering that while the sustainability of human life on the planet may be at stake in the long run, there are very few immediate threats to human health at issue in EPR. We can afford to deliberately experiment to figure out what works best.

Finally, it is valuable to note that changes in technology hold the potential for making EPR program operation and evaluation more feasible. For example, product tagging with radio frequency identification (RFID) technologies, may allow products to record information about composition and usage in ways that facilitate both (1) operational management of products at end of life (*e.g.*, allowing products to be more effectively sorted on an automated basis) and (2) acquisition of information about the path of products through the economy and waste management systems to inform policy and program design [7], [8]. (In this respect, product tagging presents an opportunity to reinvigorate notions of a "green port" once widely discussed as a means of managing end of life electronics [9], [10]). RFID, a more sophisticated version of the already familiar bar codes (uniform product codes or UPC), is likely to become ubiquitous and powerful in the near future. Its use in EPR (and other dimensions of IPP) bears serious consideration. The question is not whether advanced product tagging is on the horizon, but whether it will incorporate environmental capabilities along with its core commercial functions [11].

5. Summary and Concluding Comments

The implementation and evaluation of EPR can benefit from lessons, techniques and even general understandings developed from other environmental policies and from policy analysis more generally. Despite the ubiquitous tension between the cost of data collection and analysis on the one hand and the comprehensiveness of evaluation on the other, more breadth and depth are needed if evaluation of EPR is to be productive. This includes details on the nature of the EPR schemes in various countries and cost-benefit analyses that go beyond summing of waste tonnage. System-wide effects must be assessed. Given the central place of eco-design in EPR, impacts on product innovation need to be methodically assessed. Evaluation should be designed into EPR schemes with serious consideration given to both deliberate policy experimentation and the use of emerging innovations in information technology.

EPR PROGRAMME SUMMARIES SUBMITTED BY GOVERNMENTS

I. Introduction

The following section contains descriptions of EPR programmes in operation in member countries. These descriptions were submitted by member governments. This is not a comprehensive list of EPR programmes, however, it provides an excellent cross-section of the types of programmes OECD governments have implemented. The first chart is the one the OECD Secretariat sent out to obtain information from its members. It contains 20 questions concerning specific aspects about their EPR Programme. The remaining charts summarise the key aspects of EPR programmes in OECD countries.

II. Summary of contents

Part II Chart sent by secretariat to governments

Part III Country programmes

1. Australia
2. Canada
3. Czech Republic
4. France
5. Germany
6. Japan
7. Netherlands
8. Norway
9. Poland
10. USA

II. EPR Programme Description – Chart Sent to OECD Governments to collect information

Name of Programme:
Country:

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?		
2. Is the programme mandated, voluntary, or a negotiated agreement?		
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**		
4. What is the scope of the programme (*e.g.* products ts such as electronics, tires, vehicles, sectors, *etc.*)?		
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?		
6. What is the nature of responsibility (who has responsibility)?		
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?		
8. What is the estimated number of producers?		
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?		
10. What percentage of the total product market does the EPR programme cover?		
11. Is there a PRO? If yes, list duties of the PRO.		
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?		
13. What is the fee payment, or fee structure, in place? How is it organised?		
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?		
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)		
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)		
17. How are existing products treated?		
18. Are orphan products addressed?		
19. How are free riders addressed?		
20. What are the key implementation barriers or issues?		

1. AUSTRALIA

1A. Name of Programme: Product Stewardship Arrangements for Waste Oil
Country: Australia

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	Levy/benefit scheme. Levy is imposed on manufacturers and importers of petroleum based oils and lubricants. Benefit is then paid to recyclers of waste oil.	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated through Commonwealth legislation. Levy is collected through taxation and custom processes.	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	Legislation passed mid 2000. Legislation came into force and programme commenced operation on 1 January 2001. Subject to formal review 4 years from commencement but also subject to ongoing monitoring.	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)?	Relates to petroleum based lubricating oil.	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	High environmental impact of inappropriate use, disposal and storage of waste oil and encouraging re-use/recycling.	
6. What is the nature of responsibility (who has responsibility)?	Responsibility falls on manufacturers and importers. Although in most cases, costs have been passed onto their distributors who have in turn passed costs onto consumers.	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Financial and full (although note comments re passing on of costs).	
8. What is the estimated number of producers?	Four majors who are engaged in refining and in downstream production plus around six companies who purchase base stocks from majors and blend with additives.	

1A. Name of Programme: Product Stewardship Arrangements for Waste Oil (continued)
Country: Australia

Aspect	Description	Other Remarks
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	Very stable in terms of manufacturers/importers. Waste oil collectors and re-use sector highly variable from larger concerns to small operations.	
10. What percentage of the total product market does the EPR programme cover?	100%	
11. Is there a PRO? If yes, list duties of the PRO.	No	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	Current fee collection through existing organisations (Taxation and Customs). Program was designed to utilise existing waste oil collection infrastructure but also to encourage new entrants into waste oil recycling. Funding also provided to encourage recycling of waste oil and to improve collection and storage infrastructure especially in remote and rural communities.	
13. What is the fee payment, or fee structure, in place? How is it organised?	Set fee per litre of oil manufactured or imported (5 cents per litre). Sliding benefit scale paid to waste oil recyclers depending on nature of recycling process (ranges from 3 to 50 cents per litre). Fees collection and payments to recyclers made through taxation/customs system.	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	No formal targets set.	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Significant stakeholder involvement in developing the programme. Ongoing liaison with stakeholders. An Advisory Council has been set up comprising stakeholder representatives which meets every three or so months. Departmental webpage has full details of the programme. Currently developing a more detailed and targeted communication strategy.	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	Stakeholders include oil manufacturers and importers (and those involved in sales chain), waste oil collectors, waste oil recyclers, and consumers of oil (esp. mechanics and motor workshops, DIY, farm, mining etc). Ongoing dissemination.	

1A. Name of Programme: Product Stewardship Arrangements for Waste Oil (continued)
Country: Australia

Aspect	Description	Other Remarks
17. How are existing products treated?	Not directly addressed but collection of existing waste oil is encouraged through payment of benefits to recycle oil.	
18. Are orphan products addressed?	Not directly addressed but collection of orphan waste oil is encouraged through payment of benefits to recycle oil.	
19. How are free riders addressed?	Programme is mandated through taxation and customs system and no significant (if any) free rider problem is anticipated.	
20. What are the key implementation barriers or issues?	Problem of adequately robust data upon which to monitor progress. Getting the modelling correct – balance between revenue from fees collected and payments made to recyclers. Question of exemptions for products for which oil is a feedstock (*e.g.* ink, tyres) Consumer backlash (esp. farmers) for increased cost to them. Anecdotal evidence that benefits paid to recyclers yet to feed through to benefits to users of oil (*e.g.* farmers in some cases still having to pay for oil to be collected – disincentive for them to do the right thing).	

1B. Name of Programme: National Packing Covenant
Country: Australia

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	Negotiated agreement addressing issues such as improving packaging design to minimise waste and facilitate re-use and recycling, and minimise material and energy consumption and market development for recyclable materials.	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Voluntary agreement with legislative backup mechanism - the Used Packaging Materials National Environment Protection Measure. The NEPM was developed at a national level and implemented at a jurisdictional level.	**Companies not Covenant signatories may be caught under State/Territory NEPM legislation**
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	The Packaging Covenant is a 5 year agreement with the NEPM legislation tied to the life of the Covenant. Commenced in July 1999.	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)?	Applies to: Consumer packaging (any material for the containment, marketing and handling of retail consumer products) household paper (writing paper, cardboard and mixed paper but not newspapers or magazines which is addressed through a national industry waste reduction agreement).	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	Surplus of materials from kerbside collection systems and low end of life value	
6. What is the nature of responsibility (who has responsibility)?	Shared between industry (throughout the packaging supply chain) and by government.	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Financial and physical – shared responsibility between industry and the 3 levels of government (local, State and Commonwealth).	
8. What is the estimated number of producers?	In theory could apply to producers of most products and so total number is difficult to estimate.	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	Potentially applies to all sectors in packaging supply chain - which would have widely variable characteristics.	
10. What percentage of the total product market does the EPR programme cover?	It is estimated the Covenant now covers 70% of total market share within most sectors (see above). Short term aim of packaging covenant is to achieve 500 signatories to the covenant by December 2001. Currently 410 signatories.	
11. Is there a PRO? If yes, list duties of the PRO.	No	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	Administration undertaken on an honary basis. NEPM administered within jurisdictional current arrangements	

1B. Name of Programme: National Packing Covenant (continued)
Country: Australia

Aspect	Description	Remarks
13. What is the fee payment, or fee structure, in place? How is it organised?	Industry signatories to the Covenant contribute to a transitional funding arrangement put in place to assist kerbside collection systems achieve a market basis	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	Target is to obtain 500 signatories to the covenant by December 2001, currently have 410. As the Covenant provides a flexible approach there are no targets nor consistent measurable performance indicators.	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Information on the Packaging Covenant is included in NEPM compliance letters sent by jurisdictions to brand owners. Information is also made available to companies through their industry associations. A Covenant webpage also provides comprehensive information on the Covenant from who should sign to how to develop an action plan. The Webpage also includes signatories' action place.	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	NEPM Compliance letters are sent to brand owners. Information from industry associations is disseminated to their members. The webpage is available to the general community.	
17. How are existing products treated?	Not specifically addressed	
18. Are orphan products addressed?	Not specifically addressed	
19. How are free riders addressed?	The Used Packaging Materials NEPM focuses on brand owners who are not signatories to the Covenant. They are required to take back and reutilise a certain percentage of their packaging product. This is extremely onerous as it requires putting recovery systems in place and finding markets for the recovered material.	
20. What are the key implementation barriers or issues?	Although the Covenant doesn't solely focus on recycling, it is a major component with developing and maintaining sustainable and economically viable kerbside collection systems a key initiative. Implementation barriers are: availability of technical information for reprocessed material Acceptance by the community of recycled content in products Best practice systems adopted by local governments	

Australia is also developing product stewardship programmes in relation to electrics and electronics, waste tyres, end of life vehicles and batteries.

2. CANADA

2A. Name of Programme: ALBERTA USED OIL, FILTER, AND CONTAINER MANAGEMENT PROGRAM
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	Take back to depot mechanism with an advanced disposal fee	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated under Lubricating Oil Material Recycling and Management Regulation, Alberta Environmental Protection and Enhancement Act. The used oil, container and filter program also operates in the provinces of Saskatchewan and Manitoba where it is also mandated by regulation.	The Canadian Council of Ministers of the Environment (CCME) approached the Canadian Petroleum Products Institute with concerns about the environmental impacts of improperly handled used oil. An industry task force was created in 1993 to prepare a response and to facilitate the establishment of the program. Industry petitioned government to create the necessary regulatory framework to specifically address level playing field, free rider issues.
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	The Alberta Used Oil Management Association received regulatory approval to develop and manage the program in 1997	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)?	The program collects and promotes the proper environmental handling of used motor vehicle oil, used oil containers and used oil filters. In 2000 the program collected 61 million litres of oil, representing an estimated 68% recovery rate. The recovery rate for oil filters was 78% and for containers 38%.	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	Pressure from government for an industry response to environmental concerns about the mismanagement and improper disposal of used oil caused by poor public awareness and poorly developed infrastructure for oil recycling.	

2A. Name of Programme: ALBERTA USED OIL, FILTER, AND CONTAINER MANAGEMENT PROGRAM (continued)
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
6. What is the nature of responsibility (who has responsibility)?	Full responsibility for the collection of funds, and operation of the program rests with the distributors/wholesalers of oil, filters and containers who have jointly formed a PRO (See 11.)	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Full responsibility exercised by the oil distributers/wholesalers	
8. What is the estimated number of producers?	Not available	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	Large volumes of oil sold - an estimated 90 million litres available for collection in 2000. A history of improper disposal. Large number of do-it-yourself oil changers.	
10. What percentage of the total product market does the EPR programme cover?	100% of used oil, filters and containers	
11. Is there a PRO? If yes, list **duties of the PRO.**	The program is managed and operated by the Alberta Used Oil Management Association (AUOMA), a not for profit organization of wholesale suppliers of lubricating oil materials in Alberta. It is incorporated under provincial statute and managed by a Board made up of members, retailers, municipalities and the province. Under provincial regulation the AUOMA is enabled to collect the Environmental Handling Charge to fund the program. Annual financial reports and audits are required to be filed with the Province, and are also made publicly available. The PRO is directly accountable to the Minister of Environmental Protection.	Similar PROs for used oil, filters and containers operate in the provinces of Saskatchewan and Manitoba. The programs share a common web site and cooperate closely on program management and operation
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	There are 53 "Eco-Centre" facilities across the province and 600 other municipal and commercial operations available to receive used oil, filters and containers. The recovered materials are collected by registered collectors and paid for by AUOMA (Also see 13.) per litre collected, per kg of plastic bottles and per drum of filters.	

2A. Name of Programme: ALBERTA USED OIL, FILTER, AND CONTAINER MANAGEMENT PROGRAM (continued)
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
13. What is the fee payment, or fee structure, in place? How is it organised?	The program is funded through an Environmental Handling Charge placed on wholesale suppliers. Fees are Cdn $0.05 per litre of used oil, $0.05 per 1 litre container, $0.50 per small filter, and $1.00 per large filter. Private collectors are rewarded through Return Incentives, and Coverage is assured in all markets through the equalization across the province of oil, container and filter transportation costs through Freight Equalized Zone Pricing	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	A target of 80% recovery rate of used oil filters and containers by 2002.	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Targeted awareness campaigns are regularly run by the PRO using daily and community newspaper advertisements, radio advertisements. The 2000 communications campaign was done in cooperation with the Saskatchewan and Manitoba programs. A program mascot, Mr Oil Drop, visits recycling depots, community fairs and rodeos. A web site is shared with the Saskatchewan and Manitoba programs.	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	The general public with a special focus on do-it-yourself oil changers.	
17. How are existing products treated?	Fully covered by the program.	
18. Are orphan products addressed?	Fully covered by the program	
19. How are free riders addressed?	Through regulation which mandates distributor/wholesaler registration.	
20. What are the key implementation barriers or issues?	The challenge, particularly at the program outset, associated with educating the public, especially the do-it-yourself mechanics, of the environmental hazard posed by the indiscriminate disposal of used oil. Rate of recovery for containers lags behind that for used oil and filters	The multistakeholder process to design and implement the program has been critical to the program's success. Harmonization across the three provinces removed any incentive to move waste products across provincial boundaries.

2B. Name of Programme: BRITISH COLUMBIA PAINT STEWARDSHIP PROGRAM
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	Take back mechanism with an advanced disposal fee (see 13.)	This was the first regulated program of its kind in Canada.
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated under the Post Consumer Paint Stewardship Program Regulation, British Columbia Waste Management Act.	The British Columbia government showed a strong commitment to transfer responsibility for used paint to the private sector brand owners. The regulation was put in place before the formation of the Paint and Product Care Association (PPC) - formerly the B.C. Paint Care Association
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	The regulation came into effect on September 1, 1994 and the first full year of program operation was 1995 with the establishment of approximately 50 depots for the public drop off of used paint. Over 100 depots were operational by 1996.	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)?	The program accepts all home and commercial latex, alkyd, enamel, and oil based paints, varnishes and urethanes, marine enamels, stains, and special use paints. The program specifically excludes marine anti-fouling paint, solvents, automotive paint, and other specialty paints. The program also collects and recycles paint containers In 2000 78% of the paint collected was recycled, 11% reused, 8% fuel blended and 3% incinerated.	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	Municipal concerns about the handling and costs of waste paint in regular garbage collection and in special household hazardous waste programs. Desire to avoid landfill disposal. Interest in shifting costs to private sector.	
6. What is the nature of responsibility (who has responsibility)?	Full program responsibility is exercised by the paint brand owners in the province.	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Full responsibility for funding and management of collection program and paint recycling and reuse is held by the brand owners.	

2B. Name of Programme: BRITISH COLUMBIA PAINT STEWARDSHIP PROGRAM (continued)
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
8. What is the estimated number of producers?	Approximately 55 brand owners sell paint in B.C. and are part of the program.	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	Paint is widely distributed and available through the retail market and is commonly held in significant quantities by individual householders. Used paint is commonly the highest volume material /product collected at municipal household hazardous waste programs.	
10. What percentage of the total product market does the EPR programme cover?	100% of eligible paint (See 4.)	
11. Is there a PRO? If yes, list duties of the PRO.	The program is managed and operated by the Product Care, and the Tree Marking Paint Stewardship Program which handles most aerosol paints used by forest companies. Product Care is a not for profit PRO formed of the amalgamation in 2000 of Paint and Product Care and Consumer Product Care (which managed the provincial stewardship program for flammables, gasoline and pesticides). Only brand owner representatives sit on the PRO board. The board reports to the Provincial Minister and the program is independently audited.	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	Paint is collected through over 100 depots around the province. The depots are managed by the PRO but the operation is contracted out to existing recycling operators, municipal waste transfer stations, to landfill operators or to fire departments. Some depots operate paint exchanges. The PRO operates a central paint bulking facility and is responsible for collection from the depots.	

2B. Name of Programme: BRITISH COLUMBIA PAINT STEWARDSHIP PROGRAM (continued)
Country: CANADA (Provincial)

Aspect	Description	Remarks
13. What is the fee payment, or fee structure, in place? How is it organised?	An "eco fee" is collected from consumers at the point of sale. The fee ranges from Cdn $0.10 to Cdn $1.00 depending on product type and container size. The "eco-fee" is shown as a separate line item on the customers receipt. Fees are remitted by retailers to the PRO.	In some cases retailers may elect to offer a preferred customer discount in the amount equivalent to the "eco-fee". Provincial and federal sales taxes (PST and GST) are assessed on the fee because they are part of the product price.
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	The program aims to have all paint used up and not generated as a waste. 2001 target to collect 44% of all aerosol containers sold.	No explicit target has been set because of difficulties in measuring amount of waste paint available for collection and the diversion rate.
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	The regulation requires that every seller must provide either at point of sale a place for display of information on the program. Depot openings and closings are broadcast in newspapers, and other general program advertising is conducted by radio. The Recycling Council of BC's 1 800 answering service addresses specific questions related to the program.	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	General public	
17. How are existing products treated?	Fully covered by the program	
18. Are orphan products addressed?	Fully covered by the program	
19. How are free riders addressed?	Through regulation (See 2.)	
20. What are the key implementation barriers or issues?	Challenges surrounding initial establishment of the network of depots and working cooperatively with partners such as municipalities	2000 amalgamation of two separate PROs, Paint and Product Care and the Consumer Product Care into Product Care to jointly operate the paint depots and the depots for recovery of flammables, gasoline and pesticides.

2C. Name of Programme: REFRIGERANT MANAGEMENT CANADA
Country: CANADA (National)

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	Take back mechanism with an advanced disposal fee (see 13)	
2. Is the programme mandated, voluntary, or a negotiated agreement?	A voluntary negotiated program operating at the national level	The program was initiated by the Heating Refrigeration and Air Conditioning Institute (HRAI)in response to recommendations from the Canadian Council of Ministers of the Environment (CCME) Ozone Depleting Substances Working Group that the refrigeration industry lead in the development of an industry program for the environmentally responsible disposal of CFC refrigerants.
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	RMC was created by the HRAI in early 2001 and the program was formally launched in February 2001. Funds to operate the program started to be collected in February. The actual collection of CFCs will commence in January 2002	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)?	Collection, transportation, storage and disposal of surplus and virgin ozone-depleting chlorofluorocarbon (CFC) refrigerants from stationary refrigeration and air-conditioning equipment.	The longer term objective of the program is the collection and destruction of all ozone depleting substances from stationary refrigeration and air conditioning equipment. The program does not cover refrigerants from mobile equipment or halons
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	The high environmental impact of CFCs and other ODS. The international framework of the Montreal Protocol. The developing regulatory framework for phase out of CFCs in Canada and the regulatory precedents for product take back.	
6. What is the nature of responsibility (who has responsibility)?	Responsibility is exercised by the manufacturers and importers of CFCs in Canada	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Full responsibility for the program funding and operation is exercised by the manufacturers and importers. The collection system will use the existing wholesaler and refrigeration contractor network. (see 12)	

2C. Name of Programme: REFRIGERANT MANAGEMENT CANADA (continued)
Country: CANADA (National)

Aspect	Description	Other Remarks
8. What is the estimated number of producers?	Nine (8) producers, representing 98% of the marketplace out of a potential 10.	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	Widespread use of CFC refrigerants in stationary equipment such as supermarket freezers and chillers and building air conditioning equipment. Estimates of up to 10,000 tonnes of CFCs available for collection and destruction.	
10. What percentage of the total product market does the EPR programme cover?	Program covers all CFCs	Also see 4.
11. Is there a PRO? If yes, list duties of the PRO.	Refrigerant Management Canada is an incorporated not for profit industry PRO established by the HRAI, to manage and operate the collection system and the disposal of CFCs. RMC is a partnership among producers, importers, reclaimers, contractors and wholesalers. A representative of the CCME sits on the RMC Board as a non-voting observer.	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	The program will use the existing refrigeration wholesaler and contractor infrastructure to collect the CFCs from the equipment. RMC has placed a tender call for service providers to collect from the wholesalers and contractors and a tender for disposal service.	New disposal capacity is needed in Canada and RMC will be contracting for such capacity as part of their PRO responsibility.
13. What is the fee payment, or fee structure, in place? How is it organised?	Funds are being raised through a levy on the sales of HCFC refrigerants. The funds are being collected by RMC to pay for the CFC collection and destruction. The fee is currently approximately Cdn $1.00/kg	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	RMC aims to collect and destroy all surplus and virgin CFC refrigerants.	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Brochures, fact sheets, program guides, trade publication advertisements, posters, website, web video	

2C. Name of Programme: REFRIGERANT MANAGEMENT CANADA (continued)
Country: CANADA (National)

Aspect	Description	Remarks
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	Communications focus is primarily on the refrigeration industry and on refrigeration contractors in particular. Program launch announcements were released to the general media with support from Environment Canada.	
17. How are existing products treated?	Fully covered by the program	
18. Are orphan products addressed?	Fully covered by the program	
19. How are free riders addressed?	The PRO membership represents over 95% of the marketplace. Pressure continues to be put on the 2 small companies which are not part of RMC to join the program.	
20. What are the key implementation barriers or issues?	Current insufficient disposal capacity is being addressed through RMC tenders for provision of service by private sector companies.	

2D. Name of Programme: SASKATCHEWAN SCRAP TIRE STEWARDSHIP PROGRAM
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	Take back mechanism with an advanced disposal fee (see 13.)	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated under the Saskatchewan Environmental Management and Protection Act (1983), Saskatchewan Scrap Tire Management Regulation (September 1998)	Free riders and the need to create a level playing field were the impetus for the regulation, making the program mandatory rather than voluntary for tire retailers to collect an submit the environmental levy to fund the program
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	Voluntary initiative commenced in 1995. First full year of mandated operation 1999.	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)?	Phase 1. Recovery and recycling of all used tires (passenger vehicle, truck, small agriculture, lawn and agriculture tires with rim size greater than 7 ins) sold in Saskatchewan. Phase 2 . Cost free removal of pre-program tires from landfill sites. Phase 3. Removal of scrap tires accumulated after program commencement from private stockpiles	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	Need for proper environmental management of an estimated 1 million used tires generated annually. Avoidance of landfill disposal, illegal dumping and tire burning. To promote tire recycling	
6. What is the nature of responsibility (who has responsibility)?	Full financial responsibility and partial physical responsibility is exercised by tire retailers in the province.	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Full financial, management and operational responsibility is exercised by the tire retailers	
8. What is the estimated number of producers?	Approximately 1200 tire retailers	

2D. Name of Programme: SASKATCHEWAN SCRAP TIRE STEWARDSHIP PROGRAM (continued)
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	903,421 tires were sold in the province in 2000. Used tires are generated at an estimated rate of 1 tire per capita per year or approximately 1 million tires per annum. Tires are sold through a large number of automotive, truck and agricultural farm implement dealers, specialty shops and other retail automotive outlets.	
10. What percentage of the total product market does the EPR programme cover?	The program covers 100% of the new tires sold in the province since the program's commencement and seeks to clean up tires from landfills and private stockpiles as surplus funds accumulate from the Phase 1 program (see 4.)	
11. Is there a PRO? If yes, list duties of the PRO.	The Saskatchewan Scrap Tire Corporation (SSTC)is an incorporated not for profit industry multi stakeholder PRO formed to manage and operate the program. In addition to tire dealers the SSTC includes on its Board, an environmental group and municipal representatives. The SSTC Board files an annual report with the Provincial Minister.	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	Tire recycling fees are collected from the consumer at point of purchase by tire retailers. Registered (with the SSTC) tire retailers remit the fees to SSTC. The recycling fees are use to finance the collection of the tires and to support projects and companies that recycle scrap tires. Excess funds are dedicated to landfill clean up. Registered tire collectors are contracted by the SSTC to collect used tires from retailers. The collectors deliver the used tires to a registered scrap tire recycler who either creates products (*e.g.* truck mats, arena flooring) or processes them into usable crumb rubber for other applications.	

2D. Name of Programme: SASKATCHEWAN SCRAP TIRE STEWARDSHIP PROGRAM (continued)
Country: CANADA (Provincial)

Aspect	Description	Other Remarks
13. What is the fee payment, or fee structure, in place? How is it organised?	Fees range from Cdn $3.50 for passenger vehicle tires to Cdn $10.00 for large tires. (Also see 12.)	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	The program aims to divert 100% of tires from landfill disposal. (Also see 4.)	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	SSTC uses newsletters, brochures, a web site and trade shows to promote the program	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	General public and tire retailers	
17. How are existing products treated?	Fully covered by the program	
18. Are orphan products addressed?	Tires disposed of in landfills prior to the establishment of the program are being recovered as surplus funds permit. (See 4.)	
19. How are free riders addressed?	The regulation (See 2.) requires that all tire retailers register with the program.	
20. What are the key implementation barriers or issues?	Degree of participation by tire retailers. Some resistance by some retailers to the tire recycling fee being assessed at point of purchase. Initial flat fee for all tires was set at a level below the cost of recycling. Establishment of a new fee schedule at a new level which differentiates by tire size has addressed the issue.	

3. Czech Republic

3A. Name of Programme: No special name
Country: Czech Republic

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	Take-back, deposit/refund (in case of packaging), lower value added tax for selected recycled materials.	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated, supplemented by voluntary agreements.	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	Legislation: Act on Wastes No. 125/1997 Coll., expires on 31 December 2001 Act on Wastes No. 185/2001 Coll., in force from 1 January 2002 Act on Packaging (approved by Parliament on 5 December 2001), entry into force 1 January 2002 Oils, batteries, tyres, and fluorescent tubes will be covered by legislation from 23 February 2002, packaging will be mandatory covered from 1 June 2002, household refrigerators from 1 January 2003. Voluntary agreements: Voluntary agreement between the Ministry of Environment and EKO-KOM, joint-stock company, concerning the take-back of packaging, is in force since April 1999. Voluntary agreement between the Ministry of Environment and the Czech Association of Producers and Importers of Portable Batteries, concerning the take-back of portable batteries will be signed on 12 December 2001.	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)?	Packaging, oils, batteries, fluorescent tubes, tyres, household refrigerators.	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	Harmonisation with the European Union (Community Strategy for Waste Management)	
6. What is the nature of responsibility (who has responsibility)?	Producers and importers.	

3A. Name of Programme: No special name (continued)
Country: Czech Republic

Aspect	Description	Other Remarks
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Full and physical (possibly through a contractual arrangement)	
8. What is the estimated number of producers?	Packaging - 20 000 persons (including importers) Oils - two producers Lead acid batteries - two producers Industrial Ni-Cd batteries - one producer Tyres - two producers	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	N.a.	
10. What percentage of the total product market does the EPR programme cover?	At present, 38 per cent of packaging introduced to the Czech market is taken back on the basis of voluntary agreement between Ministry of Environment and EKO-KOM, joint-stock company.	
11. Is there a PRO? If yes, list duties of the PRO.	EKO-KOM, joint stock company. This company ensures the take-back of packaging in basis of voluntary agreement (see block 10).	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	Combination of current and new infrastructure.	
13. What is the fee payment, or fee structure, in place? How is it organised?	Advanced disposal fee, in the context of EPR, is not imposed in the Czech Republic.	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	Targets for recycling an recovery of different kinds of packaging (paper, glass, plastic, metal) are set in the Act on Packaging. Targets for other products will be set up in the Waste Management Plans.	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Dissemination of information concerning packaging including schools, municipalities, industry, *etc.* is in progress. Dissemination of information as regards other products is in preparation..	

3A. Name of Programme: No special name (continued)
Country: Czech Republic

Aspect	Description	Other Remarks
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	Information of all stakeholders is envisaged.	
17. How are existing products treated?	Packaging - reuse, recycling, recovery Oils - regeneration, transformation into fuel oils, incineration in hazardous waste incinerator Lead acid batteries - recovered into lead destined for new batteries Tyres - retreading, grinding, incineration in cement kilns	
18. Are orphan products addressed?	Pursuant to legislation in force (*e.g.* as old contaminated sites).	
19. How are free riders addressed?	Pursuant to legislation in force.	
20. What are the key implementation barriers or issues?	Drafting relevant legislation and voluntary agreements, launching the programme.	

4. France

4A. Name of Programme : il n'y a pas de programme spécifique mais des mesures dans le cadre de la politique nationale des déchets.
Country: France

What is the policy instrument used ?

Instrument réglementaire : plusieurs décrets existent ou sont en préparation sur différentes filières de produits (emballages, huiles moteurs, piles et accumulateurs, pneumatiques, véhicules, etc.)

- démarches volontaires : accord cadre véhicules hors d'usage depuis 1993, société ADIVALOR créée en 2001 pour les emballages et produits phytosanitaires par exemple
- instrument financier : taxes et contributions, réduction de taxe sur opérations de collecte sélective et traitement des ordures ménagères

Is the programme mandated, voluntary, or a negotiated agreement ?

Selon les filières de produits l'organisation diffère, mais le plus souvent les systèmes s'organisent librement sur la base d'un cadre réglementaire qui impose la responsabilité du producteur et peut répartir des responsabilités diverses sur les différentes catégories d'acteurs (par exemple le rôle du distributeur dans la reprise -gratuite- des produits distribués. Dans de nombreux cas l'organisation retenue par les producteurs doit faire l'objet d'une approbation des pouvoirs publics (conventions, agréments).

What are the dates of legislation, start of programme, programme implementation ?

La loi du 15 juillet 1975 relative à l'élimination des déchets et à la récupération des matériaux a posé le principe de la responsabilité qui incombe selon les cas soit au producteur du produit, responsable de la mise sur le marché de ce produit, soit au producteur du déchet, dernier détenteur de celui-ci.

L'article 6 de la loi indique notamment que : « La fabrication, la détention en vue de la vente, la mise en vente, la vente et la mise à la disposition de l'utilisateur, sous quelque forme que ce soit, de produits générateurs de déchets peuvent être réglementées en vue de faciliter l'élimination desdits déchets ou, en cas de nécessité, interdites. Il peut être fait obligation aux producteurs, importateurs et distributeurs de ces produits ou des éléments ou matériaux entrant dans leur fabrication de pourvoir ou de contribuer à l'élimination des déchets qui en proviennent. » Ces articles figurent désormais dans le code de l'environnement.

What is the scope of the programme ?

Des décrets existent pour les huiles (1979) pour lesquelles les producteurs acquittent une taxe depuis 1994, les emballages (décrets de 1992, 1994, 1996, 1998) en conformité avec la directive européenne de 1994 avec un principe de contribution financière des producteurs, les piles et accumulateurs depuis 1997 avec adhésion à des organismes opérateurs sur la base d'une contribution des producteurs.

Un accord cadre a été conclu en 1993 pour les véhicules et un décret est en préparation en application de la directive européenne qui confirme le principe de la responsabilité du producteur. Les professionnels ont organisé en 2001 une filière de récupération des emballages et produits phytosanitaires sur une base volontaire.

Des travaux sont engagés pour les filières des produits électriques et électroniques, des pneumatiques et des films plastiques agricoles, avec également un principe de responsabilité des producteurs dans le financement et l'organisation des dispositifs de collecte et de traitement

What are the principal drivers in the choice of product ?

Il y a principalement trois aspects :
la recherche d'un haut niveau de protection de l'environnement en travaillant sur les quantités et les qualités

l'optimisation du service public des déchets par l'organisation, la maîtrise des coûts et la pérennité des filières
la valorisation sur les plans des matériaux et de l'économie

What is the nature of responsability ?

La responsabilité incombe au producteur du produit ou au détenteur du déchet, mais dans la plupart des cas la responsabilité du producteur initial du produit est établie sur les plans de l'organisation et du financement.

What is the distribution of responsibility ?

Le producteur est responsable du financement et de l'organisation matérielle des systèmes, pour laquelle il peut se tourner vers des opérateurs agréés ou conventionnés. Il y a des variantes selon les filières, et le distributeur a dans certains cas une responsabilité dans la reprise des déchets générés par les produits vendus.

What is the estimated number of producers ?

Ce sont tous les producteurs et importateurs des produits concernés et de leurs emballages.

What are the specific market characteristics ?

Ce sont des produits manufacturés, qu'il s'agisse de la grande distribution ou du commerce de détail, des secteurs de l'emballage et des produits mentionnés ci-dessus.

What percentage of the total product market does the EPR programme cover ?

Pas de réponse à cette question.

Is there a PRO ? Non

What is the operational structure ?

Ce sont des organismes professionnels et sociétés agrées.

What is the fee payment, or fee structure in place ?

Les taxes ou contributions sont calculées par rapport à la responsabilité, totale ou partielle, avec des barèmes propres à chaque filière, en fonction des quantités mises sur le marché, collectées et traitées.

Are there any targets ?

Des objectifs sont définis, notamment pour les emballages et les véhicules, qui reprennent et appliquent les directives européennes.

How is information disseminated to affected and interested parties ?

Il y a à la fois :

- des statistiques et données transmises aux instances européennes
- les publications des professionnels
- parfois des campagnes télévisées (Eco-emballages)

To whom is the information disseminated and how often ?

Tous publics, de manière annuelle pour les chiffres transmis aux instances publiques, sporadiques pour les autres informations.

How are existing products treated?

Ils rentrent dans les filières spécifiques existantes en vue d'un recyclage matière ou d'une incinération avec production d'énergie.

Are orphan products addressed? Oui.

How are free riders addressed?

Des sanctions financières et pénales sont prévues.

What are the key implementation barriers or issues?

Ce sont principalement:

- les coûts de la collecte et du traitement par rapport au prix des matières premières vierges
- l'archaïsme de certains secteurs professionnels

5. Germany
5A. Name of Programme: Packaging Ordinance
Country: Germany

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	- obligations to take-back and recycle packaging materials after use - recycling targets (quota) - deposit / refund for "one-way" beverage containers	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	1991	
4. What is the scope of the programm (*e.g.* products such as electronics, tire vehicles, sectors, *etc.*)?	packaging materials (differentiated measures addressing transport packaging, secondary packaging, sales packaging); similar programmes, some on a voluntary basis, on vehicles, print paper, batteries, electronic equipment (draft)	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	environmental impact particularly at end of life of the product; significant growth potential of the waste stream; shortages in municipal disposal capacities; high public awareness	
6. What is the nature of responsibility (who has responsibility)?	producers and retailers share responsibilities to take back and recycle/recover	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	financial and physical in the first place; if it participates in the Dual System (see below), the individual company can "reduce" its responsibility to a financial responsibility	
8. What is the estimated number of producers?	Many	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	high number and great diversity of producers and retailers; wide distribution	
10. What percentage of the total product market does the EPR programme cover?		
11. Is there a PRO? If yes, list duties of the PRO.	producers and retailers have created a private company, Duales System Deutschland AG (DSD), which takes back sales packaging at the private households; producers and retailers who participate in such a system are exempted from their individual obligations to take back and recycle packaging materials; such a system has to collect packaging materials at/or close to <u>all</u> households; it must achieve – inter alia - differentiated recycling targets for all materials collected; otherwise the system's licence to operate is revoked by state authorities	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	see above (11.) ; DSD was established in 1991 as a private (non-profit) company which collects sales packaging on behalf of producers and retailers; DSD has set up a nation wide system for collection, sorting and recycling/recovery of sales packaging; in addition there are some companies which collect and recycle transport packaging, and to a certain degree sales packaging on behalf of companies which do not participate in the Dual System	

5A. Name of Programme: Packaging Ordinance (continued)
Country: Germany

Aspect	Description	Remarks
13. What is the fee payment, or fee structure, in place? How is it organised?	fees are charged (on a private basis) by DSD; fees are differentiated depending on material, size, weight of packaging	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	recycling quota in the Packaging Ordinance are binding: Glass 75%, Tin 70%, Aluminium 60%, Paper, Cardboard 70%, Compounded Materials 60%, Plastic Materials 60 % (with a minimum share of 36 % required to go to material recycling, another 24 % are to be consigned to material recycling, feedstock recycling or energy recovery) in addition: 72 % market share target for refillable beverage containers	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Various	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)		
17. How are existing products treated?		
18. Are orphan products addressed?		
19. How are free riders addressed?	free riders are a major problem; by an amendment to the Ordinance in 1998 they were obliged to achieve the recycling targets (see above)	
20. What are the key implementation barriers or issues?	key issues are: fair competition among addressees; reducing the number of free riders; reducing the cost of implementation; increase the impact on prevention	

6. Japan

6A. Name of Programme: Containers and Packaging Recycling Law and Law for Recycling of specified kinds of home appliances
Country: JAPAN

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	**Take back:** Containers and Packaging Recycling Law, Law for Recycling of specified kinds of home appliances **Recycling Content:** Law for promotion of effective utilisation of resources **Designing products with recyclable parts:** Law for promotion of effective utilisation of resources **Labelling of products for selective collection:** Law for promotion of effective utilisation of resources	
2. Is the programme mandated, voluntary, or a negotiated agreement?	**Mandated:** Containers and Packaging Recycling Law, Law for promotion of effective utilisation of resources, Law for Recycling of specified kinds of home appliances **Voluntary:** Waste processing and Recycling Guidelines by types of product and industrial sector, Automobile recycling initiative	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	Containers and Packaging Recycling Law (full enforcement April 2000) Law for Recycling of specified kinds of home appliances (enforcement April 2001) Law for promotion of effective utilisation of resources (enforcement April 2001) Waste processing and Recycling Guidelines by types of product and industrial sector (start December 1990) Automobile recycling initiative (start May 1997)	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)	**Containers and Packaging Recycling Law:** glass containers, pet bottles, plastic containers and packaging styrofoam trays, paper containers and packaging **Law for Recycling of specified kinds of home appliances:** air conditioners, braun tube TVs, refrigerators, washing machines **Law for promotion of effective utilisation of resources:** 10 business types and 69 products **Waste processing and Recycling Guidelines by types of product and industrial sector:** 18 business types and 35 products **Automobile recycling initiative:** end-of-life vehicles	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	Discharge volumes, usefulness of resources included and difficulty of processing	
6. What is the nature of responsibility (who has responsibility)?	Appropriate sharing of roles by businesses, consumers, government and local authorities must be determined in order to maximise the efficacy and efficiency of the whole system, based on the characteristics of the respective sector	

6A. Name of Programme: Containers and Packaging Recycling Law and Law for Recycling of specified kinds of home appliances (continued)
Country: JAPAN

Aspect	Description	Other Remarks
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	**Containers and Packaging Recycling Law:** Role of consumers Consumers must assume the role of separating waste on discharge as suppressing the generation of waste through the rational use of containers and packaging Role of businesses Businesses that manufacture or use the relevant containers and businesses that use the relevant packaging bear the obligation to recycle Role of municipalities Municipalities must draw up selective collection plans and devise necessary measures for selective collection in their local areas **Law for Recycling of specified kinds of home appliances:** Manufacturers, Importers Manufacturers *etc.* are obliged to collect target appliances which they themselves have manufactured when requested to do so, and are also obliged to arrange places for collection as appropriate. They must also recycle the waste from target appliances they have collected Retailers Retailers must collect target appliances when requested to do so under certain specific conditions. They must also transfer the collected appliances to the manufacturers etc thereof (or independent body) Municipalities Municipalities must either transfer collected target appliances to the manufacturers *etc.* thereof (or independent body) or must themselves recycle them Consumers Consumers must cooperate by for example transferring target appliances to retailers *etc.* and paying fees for collection, recycling *etc.*	
8. What is the estimated number of producers?	**Containers and Packaging Recycling Law:** Unknown **Law for Recycling of specified kinds of home appliances:** About 50 Co.	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	**Containers and Packaging Recycling Law:** A lot of companies exist in this market **Law for Recycling of specified kinds of home appliances:** Four electric appliances are produced about 18 million in a year	
10. What percentage of the total product market does the EPR programme cover?	**Containers and Packaging Recycling Law:** Unknown **Law for Recycling of specified kinds of home appliances:** Almost 100%	
11. Is there a PRO? If yes, list duties of the PRO.	**Containers and Packaging Recycling Law:** The Japan Container and Package Recycling Association **Law for Recycling of specified kinds of home appliances:** Association for Electric Home Appliances	

6A. Name of Programme: Containers and Packaging Recycling Law and Law for Recycling of specified kinds of home appliances (continued)
Country: JAPAN

Aspect	Description	Other Remarks
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	**Containers and Packaging Recycling Law:** Current civil infrastructure and Japan Containers and Packages Recycling Association **Law for Recycling of specified kinds of home appliances:** A combination two and Association for Electric Home Appliances	
13. What is the fee payment, or fee structure, in place? How is it organised?	**Containers and Packaging Recycling Law:** About 90 000 yen/ton in 2000 (PET bottle) **Law for Recycling of specified kinds of home appliances:** From 2,400 to 4,600 yen (recycling cost) + charge of transportation	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	**Containers and Packaging Recycling Law:** Returning ratio (voluntary target) PET bottle 50% (2004) Glass containers 80% (2005) **Law for Recycling of specified kinds of home appliances:** Recycling ratio Air conditioner more than 60%, TV more than 55%, refrigerator more than 50% washing machine more than 50%	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	The recycling promotion campaign Recycling promotion month project The ceremony for awarding an honor to people who contribute to promoting recycling Providing information concerning the enlightenment and dissemination for recycling	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	Consumers, Businesses	
17. How are existing products treated?	**Law for Recycling of specified kinds of home appliances:** Existing products are treated by last owner pays	
18. Are orphan products addressed?	**Law for Recycling of specified kinds of home appliances:** PRO takes back brands that no longer have a parent company	
19. How are free riders addressed?	**Containers and Packaging Recycling Law:** **Law for Recycling of specified kinds of home appliances:** Government deals with free riders by reporting requirement and sanctions	
20. What are the key implementation barriers or issues?	**Containers and Packaging Recycling Law:** Existence of free riders **Law for Recycling of specified kinds of home appliances:** Illegal waste disposal and regional wage differential of transport	

7. Netherlands

7A. Name of Programme: Batteries
Country: Netherlands

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	**Adf**	**see also www.minvrom.nl**
2. Is the programme mandated, voluntary, or a negotiated agreement?	**Mandated, Batteries disposal decree, now based on the EC directive**	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	**1995** **1990** **1995**	
4. What is the scope of the programm (*e.g.* products such as electronics, tire vehicles, sectors, *etc.*)?	**Batteries**	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	**environmental impact (content of batteries)**	
6. What is the nature of responsibility (who has responsibility)?	**producers/importers to collect and to process**	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	**full responsibility**	
8. What is the estimated number of producers?	**600**	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?		
10. What percentage of the total product market does the EPR programme cover?	100	
11. Is there a PRO? If yes, list duties of the PRO.	**STIBAT**	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	**separate collection by local authorities (hazardous waste collection) and by retailers**	
13. What is the fee payment, or fee structure, in place? How is it organised?	**adf, paid by the importers**	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	**yes, 90% separation 1999** **,monitoring by industry, independent second opinion**	**70 % real collection in 2000**

7A. Name of Programme: batteries (continued)
Country: Netherlands

Aspect	Description	Remarks
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	**Diverse** **about 50% of the total budget of Stibat is used for information.**	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	**Diverse**	
17. How are existing products treated?	**existing as well as orphans are in the system**	
18. Are orphan products addressed?	**see 17**	
19. How are free riders addressed?	**Enforcement**	
20. What are the key implementation barriers or issues?	**separate collection of small batteries is very difficult to reach high targets.**	

7B. Name of Programme: Waste Management of Packaging
Country: Netherlands

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?		**See also www.minvrom.nl**
2. Is the programme mandated, voluntary, or a negotiated agreement?	**Mandated (European legislation) with voluntary agreement**	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	 **1997** **1992, packaging covenant I; 1997 covenant II** **1992**	
4. What is the scope of the programm (*e.g.* products such as electronics, tire vehicles, sectors, *etc.*)?	**All packaging covered by EU-packaging directive, also all paper-cardboard.**	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	**High quantities with high public (political) impact**	
6. What is the nature of responsibility (who has responsibility)?	**Packaging supply chain, local authorities, retailers**	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	**Financial by packaging supply chain. Collection partially by local governments**	
8. What is the estimated number of producers?	**500.000**	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?		
10. What percentage of the total product market does the EPR programme cover?	100%	
11. Is there a PRO? If yes, list duties of the PRO.	**SVM-Pact**	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	**Current infrastructure used**	
13. What is the fee payment, or fee structure, in place? How is it organised?	**Membership of SVM, packaging suppliers**	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	**Yes** **Not exceeding a specific quantity to landfill or incineration. Target must be achieved by a combination of prevention and recycling. Targets are set.** **Targets are monitored in a specific monitoring program and yearly reported to the Packaging Committee, which has a specific status.**	

7B. Name of Programme: Waste Management of Packaging (continued)
Country: Netherlands

Aspect	Description	Remarks
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	**Various methods**	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)		
17. How are existing products treated?	**No difference between orphan, historical and existing products**	
18. Are orphan products addressed?	**See 17**	
19. How are free riders addressed?	**By enforcement, done by the government.**	
20. What are the key implementation barriers or issues?	**Monitoring; plastics recycling possibilities; street litter and drinking beverages**	At this moment negotiations are going on whether there will be a new covenant or only regulations. Disagreement on responsibilities for collecting glass and paper/cardboard; Disagreement on the way the litter problem has to be solved.

7C. Name of Programme: Plastic films for agriculture and horticulture; PVC exterior building materials; PVC Piping
Country: Netherlands

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	**3 more or less voluntary (relatively small) systems with PRO,s.** **generally binding declaration of a adf**	**see also www.minvrom.nl**
2. Is the programme mandated, voluntary, or a negotiated agreement?	**mandated for plastic films for agriculture** **others voluntary**	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	 **1998** **1990** **1995**	
4. What is the scope of the programm (*e.g.* products such as electronics, tire vehicles, sectors, *etc.*)?		
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?		
6. What is the nature of responsibility (who has responsibility)?		
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?		
8. What is the estimated number of producers?		
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?		
10. What percentage of the total product market does the EPR programme cover?		
11. Is there a PRO? If yes, list duties of the PRO.	**3 pro's**	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?		
13. What is the fee payment, or fee structure, in place? How is it organised?		
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?		
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)		

7C. Name of Programme: Plastic films for agriculture and horticulture; PVC exterior building materials; PVC Piping (continued)
Country: Netherlands

Aspect	Description	Remarks
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)		
17. How are existing products treated?	**all products treated**	
18. Are orphan products addressed?		
19. How are free riders addressed?		
20. What are the key implementation barriers or issues?	**separate collection**	

7D. Name of Programme: Used Car Tyres
Country: Netherlands

Aspect	Description	Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	take back; prohibition on landfill of used tyres	see also www.minvrom.nl
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	 1995 1990 1995	
4. What is the scope of the programme (*e.* products such as electronics, tires, vehicles, sector *etc.*)?	car tyres (not on End-of-Life – EOL). vehicles, this is separately regulated)	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	environmental impact; as litter	
6. What is the nature of responsibility (who has responsibility)?	producers to organise take back and processing	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	partial responsibility; they have to organise take back and processing; no financial responsibility	The decree does not actually make producers responsible for the disposal costs, nor does it specify that the used tyre must be taken back free of charge.
8. What is the estimated number of producers?	100 (incl. importers)	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?		
10. What percentage of the total product market does the EPR programme cover?	100%	

7D. Name of Programme: Used Car Tyres (continued)
Country: Netherlands

Aspect	Description	Remarks
11. Is there a PRO? If yes, list duties of the PRO.	Stichting Band en Milieu. In name of producers/importers works on implementing decree.	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	current infrastructure is used; current collecting companies are certified according rules of the PRO.	
13. What is the fee payment, or fee structure, in place? How is it organised?	Paid by last owner; every chain pays his own costs	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	60% re-use, 20% material recycling, 20% waste to energy. Monitoring by PRO. But not a success	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	every year	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)		
17. How are existing products treated?	existing as well as orphaned products are within the decree	
18. Are orphan products addressed?		
19. How are free riders addressed?	by national authorities	
20. What are the key implementation barriers or issues?	Key barriers are relative freedom to implement; decree will be changed next year, when the obligation is added that last owner has the opportunity to give the used tyres to the system at least free of charge, when buying new ones. This is possible throughout the whole chain (garage/ tyre sellers gan give old for new free of charge to the importers as well; local authorities can give collected tyres also back to the producers free of charge).	

7E. Name of Programme: Waste management of End of Life Vehicles
Country: Netherlands

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	General binding declaration of an agreement between importers for an advance disposal fee. (1994, 1997, 2000)	See also www.minvrom.nl
2. Is the programme mandated, voluntary, or a negotiated agreement?	Negotiated agreement, resulting in an action plan in 1992. In 2002 mandated, implementation of European directive on EOL vehicles	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	 New legislation in 2002 in force 1994 first general binding declaration since 1992	
4. What is the scope of the programme (*e.g* products such as electronics, tires, vehicle sectors, *etc.*)?	End of life vehicles	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	High environmental impact; processing activities not sophisticated; importers wanted a more green image for cars.	
6. What is the nature of responsibility (who has responsibility)?	Producers/importers for setting up a system and for financing it.	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	Producers/importers together with other links in the automobile chain set up an organisation Auto Recycling Nederland (ARN) to oversee this task in 1993	
8. What is the estimated number of producers?	55	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?		
10. What percentage of the total product market does the EPR programme cover?	100%	

7E. Name of Programme: Waste management of End of Life Vehicles (continued)
Country: Netherlands

Aspect	Description	Remarks
11. Is there a PRO? If yes, list duties of the PRO.	Auto Recycling the Netherlands (ARN) set up and maintain system for take back, processing and financing eol vehicles	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	Current infrastructure is used, but contracted in tendering procedures for several activities.	
13. What is the fee payment, or fee structure, in place? How is it organised?	Adf of 40 euro, paid by consumers when buying a new vehicle. Originally paid by the importers into a fund of ARN. Fee is used for paying the activities in recycling a car which cost money.	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	Yes, 86% recycling in 2000; 2007 95%. Criteria: negotiated with industry, what is reachable. Monitoring by industry, Yearly reported to the government.	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Diverse	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	Diverse	
17. How are existing products treated?	No difference between historical, orphans and existing products	
18. Are orphan products addressed?	See 17	
19. How are free riders addressed?	Enforcement by Ministry	
20. What are the key implementation barriers or issues?	Possible “stand alone” systems by individual importers	

7F. Name of Programme: WEEE
Country: Netherlands

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	2 different systems are actually used by producers/importers of EEE in NL. NVMP for the consumer electronics, works with an ADF: visible for consumers on top of price new appliances. Producers and importers pay a.d.f. into a fund; ICT-Milieu for Information, Communication technologies works with a system where producers pay on their market share of collected and treated products.	see also www.minvrom.nl
2. Is the programme mandated, voluntary, or a negotiated agreement?	mandated after 7 years negotiation	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	 1998 1990 1998	
4. What is the scope of the programme (*e.g.* products such as electronics, tires, vehicle sectors, *etc.*)?	electrical and electronic appliances used in households and office equipment.	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	high environmental impact (on incineration.)	
6. What is the nature of responsibility (who has responsibility)?	retailers collect old for new; local authorities also collection; producers/importers are responsible for the collected equipment: logistical, financial and organisational responsibility	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	see 6	
8. What is the estimated number of producers?	800	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	depending on the appliances	
10. What percentage of the total product market does the EPR programme cover?	100% ?	

7F. Name of Programme: WEEE (continued)
Country: Netherlands

Aspect	Description	Remarks
11. Is there a PRO? If yes, list duties of the PRO.	NVMP ICT-Milieu, see 1	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	new infrastructure, for separate collection; for logistics	
13. What is the fee payment, or fee structure, in place? How is it organised?	sea1	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	different recycling targets for different product groups criteria: what is reachable at this moment, based on experiments. monitoring by industry, yearly. Monitoring of all statistics by government on a 3 year base	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	several, with a large budget by NVMP	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	Several	
17. How are existing products treated?	existing as well as orphaned products are treated	
18. Are orphan products addressed?	see 18	
19. How are free riders addressed?	enforcement by authorities	
20. What are the key implementation barriers or issues?	Prohibition by competition authorities of visible fixed fee on consumer electronic products Collection of small appliances is not more than 20%	

8. Norway

8A. Name of Programme: EPR on plastic packaging
Country: NORWAY

Aspect	Description	Other Remarks
1. What is the policy instrument used (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	A covenant where the packers and fillers pay a fee to the PRO, who is subsidising the End-of-Life phase	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Negotiated agreement	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	 14th of September 1995 Spring 1994 1st of July 1996	
4. What is the scope of the programme (*e.g* products such as electronics, tires, vehicle sectors, *etc.*)?	Plastic packaging from industry and households, including EPS	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of life value, *etc.*)?	Low end-of – life value and relatively high environmental impact. Also, the lifetime of packaging is rather short, so it is easier to get a high throughput =) easier to gain experience on how this works	
6. What is the nature of responsibility (who has responsibility)?	Packers and fillers pay the fee, plastic packaging producers develop the recycling capacity and the retailers are "controllers" in order to reduce number of free-riders	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	See 6	
8. What is the estimated number of producers?	Approximately 1050 companies pay fee to PRO	
9. What are the specific market characteristics (high turnover, wide distribution, *etc.*)?	Wide distribution, short life time, high throughput	
10. What percentage of the total product market does the EPR programme cover?	30 % of all plastic waste is packaging	

8A. Name of Programme: EPR on plastic packaging (continued)
Country: NORWAY

Aspect	Description	Remarks
11. Is there a PRO? If yes, list duties of the PRO.	Yes, Plastretur: "develop, run, manage, monitor and organise collection and recovery of plastic packaging to meet the objectives of 50 % energy recovery and 30 % material recycling".	
12. What is the operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	New infrastructure for collection and sorting, both from households and industry. New plastic recycling company established (Folldal). Current infrastructure for transportation is used	
13. What is the fee payment, or fee structure, in place? How is it organised?	1,70 NOK per kg (0,21 Euro). Materialretur is a ”economic PRO” for all the EPR programmes in Norway, responsible for organising the collection of fees and for reducing the number of free-riders. The fee is paid four times a year.	
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	30 % material recycling 50 % energy recovery Criteria: Socio-economic assessments Monitored by Plastretur, who once a year reports to Norwegian Pollution Agency	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	Posters, information brochures and some commercials Meetings with the parties	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly, *etc.*)	Materialretur gives information mainly to the producers, while Plastretur gives information to consumers, municipalities and the end-of-life chain. Ministry of Environment is responsible for information on statistics.	
17. How are existing products treated?	Collected and sorted, the clean packaging is sent to material recycling, the rest to energy recovery	
18. Are orphan products addressed?	Yes, but plastic packaging has a short lifetime, so this is no problem	
19. How are free riders addressed?	Grüne Punkt and through retailers demanding membership in Materialretur	
20. What are the key implementation barriers or issues?	Low efficiency in sorting, both in households and in sorting plants. Lack of marked products telling whether the packaging could be recycled or not.	

9. Poland

Aspect	Description	Other Remarks
1. WHAT IS THE POLICY INSTRUMENT USED (*e.g.* take-back, deposit/refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)?	product and deposit charges	
2. Is the programme mandated, voluntary, or a negotiated agreement?	Mandated	
3. What are the dates for: - **Legislation** - **Start of programme** - **Programme implementation**	the date of Parliament's adoption: 11 May 2001 the date of entering into force: 1 Jan 2002	The Act of 11 May 2001 on corporate obligations in scope of certain waste and on the product and deposit charge
4. What is the scope of the programme (*e.g.* products such as electronics, tires vehicles, sectors, *etc.*)?	packaging, ni-cd batteries, galvanic cells and primary batteries, tires, discharge lamps, lubricating oils, refrigerating and air-conditioning equipment, lead-acid accumulators	
5. What are (were) the principal drivers in the choice of product (*e.g.* high environmental impact, low end of live value, *etc.*)?	all products of high environmental nuisance and dispersed usage, some of them dangerous for environment (batteries, accumulators, discharge lamps, lubricating oils)	
6. What is the nature of responsibility (who has responsibility)?	producers and importers (firms) who place products on domestic market in most types of packaging as well as products enumerated in the Act are obliged to achieve the target rates of packaging and post-consumer waste recovery and recycling	
7. What is the distribution of responsibility (*e.g.* financial and physical, full or partial, *etc.*)?	firms should ensure that packaging and post-consumer waste is recovered and recycled (full and physical responsibility) or shall pay a product charge (financial responsibility for unsatisfied physical obligations); all firms' responsibilities could be fulfilled through a 'recovery organisation', established in accordance with the Act	
8. What is the estimated number of producers?	hard to estimate; sufficient data should be accessible after first quarter of 2002 when notification would be finished; for firms which packaging their products it is up to several thousands	

9. Poland (continued)

Aspect	Description	Other Remarks
9. What are the specific market characteristics (high turn-over, wide distribution, *etc.*)?	great number of market members, especially in the packaging area	
10. What percentage of the total product market does the EPR programme cover?	see answer for point no. 8	
11. Is there a PRO? If yes, list duties of the PRO.	firms may satisfy the recovery and recycling obligations individually or through a 'recovery organisation' in the form of a joint-stock company; there is no limit of number of PRO but organisations which were only established in accordance with the Act rules may take over all firms' obligations (recovery and recycling limits, reporting, paying product charges)	
12. What is operational structure (*e.g.* current infrastructure used, a new infrastructure was created or a combination of the two)?	mostly current infrastructure and existing administration used; some investment on recovery (esp. collecting) systems should be necessary	
13. What is the fee payment, or fee structure, in place? How is it organised?	1. the charges are differentiated by their environmental nuisance and recovery (recycling) costs; 2. the product charge shall be calculated as the product of the charge rate and the difference between the required and the achieved recovery (recycling) rates; 3. the retail seller is obliged to collect a deposit charge where in the case of the sale of a lead-acid accumulator the buyer doesn't transfer a used accumulator to the seller; 4. maximal product charge rates will be valorised annually on previous year inflation rate	maximal product charge rates: - packaging PLN 3/kg - refrigerating, air-conditioning equipment PLN 150/piece - ni-cd accumulators PLN 50/piece - batteries PLN 5/piece - lubricating oils PLN 2/kg - discharge lamps PLN 3/kg - new and retreated used tyres PLN 2/kg - unretreated used tyres PLN 8/kg

9. Poland (continued)

Aspect	Description	Other Remarks
14. Are there any targets? If yes, what is the nature of the target? What are the criteria for setting targets? How are targets monitored and to what extent are they monitored?	by Dec 2007 firms shall be obliged to achieve the target rates of packaging and post-consumer waste recovery and recycling at least at the levels set out in the Act; the packaging and post-consumer waste recovery and recycling rates is the percentage shares of the mass or quantity of packaging and post-consumer waste recovered or recycled, respectively, in the total mass or quantity of packaging or products placed on the market in annual periods Targets would be monitored through reporting system and controlled by the voivodship marshall offices, Inspectorate for Environmental Protection and The Trade Inspectorate in the case of deposit refund system	
15. How is information disseminated to affected and interested parties, (Method and media used: television, brochures, posters, electronic, *etc.*)	- published in The Official Journal No 63, Item 639 of 2001 - Internet - seminars, lectures, meetings - post-conference publications	
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain; once a year, monthly	firms under the Act obligations, recycling firms, local authorities	
17. How are existing products treated?	the Act considers products placed on the market after 1 Jan 2002	
18. Are orphan products addressed?	the scope of the Act is firmly enumerated in his annexes by Polish Classification of Goods and Services and contains environmentally-friendly exclusions; list of the products scoped in the Act shall be broaden in future	
19. How are free riders addressed?	the Act is valid for all manufacturers of products and all importers who place products on domestic market in most types of packaging as well as products enumerated in the Act	
20. What are the key implementation barriers or issues?	- some recovery (recycling) infrastructure should be created - increase of product costs - new challenges for public administration and control services, especially on municipal level - lack of secondary materials market - weak ecological awareness of the society	

10. United States

10A. Name of Programme: Product Stewardship
Country: United States

Aspect	Description	Other Remarks
1. What is the policy instrument used? (*e.g.* take-back, deposit/ refund, advance disposal fee, UCTS, material taxes, recycling content, *etc.*)	**Thermostat Recycling Corporation (TRC)** - Wholesaler-funded take-back program. Participating wholesalers pay a one-time fee of $15 to TRC. Fee covers return postage and recycling. When collection container is full, wholesalers send them back to TRC and receive a new container. **Carpet America Recovery Effort** - Voluntary industry commitment to increase recovery and recycling of carpet through industry consortium formed to manage this recovery. Ten year industry goals for increased utilization of used carpets. Also, model procurement guidelines to be implemented by States to help support increased recovery of carpet. **Lead-Acid Battery Legislation -** Lead-acid battery recycling has three types of finance models: 1) State-mandated "deposit in lieu of trade-in" (SMD) (if a consumer does not trade in a used battery upon buying a new one, the consumer must pay a deposit); 2) State mandated Advance Disposal Fee (ADF); or voluntary "deposit in lieu of trade-in" (VD). Retailer take-back in all cases. **Rechargeable Battery Recycling Corporation (RBRC) -** Industry-funded take-back for certain types of consumer product batteries. Manufacturers pay a licensing fee to RBRC to pay for collection, transport and recycling, and receive in return permission to use RBRC logo. Retailers collect used batteries. **Bottle Bill Legislation -** Refundable deposit system. Consumers pay retailers a deposit at point of purchase, and can redeem their deposit when they return empty containers to retailers or redemption centers. Bottle distributors pay retailers and redemption centers a general handling fee and a return deposit for all collected containers.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
2. Is the programme mandated, voluntary, or a negotiated agreement?	**Thermostat Recycling Corporation** -Voluntary. **Carpet America Recovery Effort** - Voluntary agreement negotiated by industry, states and others. **Lead-Acid Battery Legislation -** Twelve states have mandated fees to cover recovery of these batteries (either a deposit in lieu of trade-in or advance disposal fee). In all remaining states, most retailers voluntarily employ a deposit in lieu of trade-in as part of their corporate policy. **Rechargeable Battery Recycling Corporation -** Voluntary system. Federal law passed which "facilitates" program, but does not mandate it per se. **Bottle Bill Legislation -** Mandated by legislation in ten states and one city.	
3. What are the dates for: **- Legislation** **- Start of programme** **- Programme implementation**	**Thermostat Recycling Corporation** -Established in 1998 in the Midwest and Florida; expanded in 2001 to all of the continental US. **Carpet America Recovery Effort (CARE)** - Signing of negotiated agreement and official CARE program launch scheduled for January 8th 2002. **Lead-Acid Battery Legislation -** In the states with mandated fees, most of the fees date back to 1989-1991. The combination of these fees, along with landfill bans in other states and requirements that retailers accept used batteries as trade-ins has resulted in an overall recycling rate of 93.3% in the US. **Rechargeable Battery Recycling Corporation -** Created in 1994 to collect nickel-cadmium batteries. Expanded in 2001 to collect nickel-metal-hydride, lithium ion, and small sealed lead-acid batteries. **Bottle Bill Legislation -** 1971 through 1987.	**Lead-Acid Battery Legislation -** The value of recycled lead has also driven retailers to institute deposits and trade-in fees as an incentive for consumers to return their end-of-life batteries.

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
4. What is the scope of the programme? (*e.g.* products such as electronics, tires, vehicles, sectors, *etc.*)	**Thermostat Recycling Corporation** -All mercury-containing thermostats in the continental US. **Carpet America Recovery Effort** - All types and brands of carpet nationally. **Lead-Acid Battery Legislation -** All lead-acid batteries. **Rechargeable Battery Recycling Corporation -** All rechargeable batteries (nickel-cadmium, Ni-Cd), nickel metal hydride (Ni-MH), lithium ion (Li-ion), and small sealed lead acid (Pb)). **Bottle Bill Legislation -** Programs cover some or all of the following: beer/malt beverage containers, carbonated and non-carbonated soft drink and water containers, fruit and sports drink containers, coffee, tea, and liquor containers.	
5. What are/were the principal drivers in the choice of the product? (*e.g.* high env. impact, low end-of-life value, *etc.*)	**Thermostat Recycling Corporation** -Toxicity, potential product ban. **Carpet America Recovery Effort** - Low recycling levels, high volume, and potential landfill bans, and product stewardship activity on the part of some manufacturers. **Lead-Acid Battery Legislation -**Landfill bans, toxicity. **Rechargeable Battery Recycling Corporation -** High consumer usage, low recycling rate, toxicity. **Bottle Bill Legislation -** Low recycling rates, high volume, raw material resource conservation.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
6. What is the nature of responsibility? (who has responsibility?)	**Thermostat Recycling Corporation (TRC)** - TRC pays for and arranges for recycling. Manufacturers are responsible for collecting and mailing the thermostats to TRC for recycling. **Carpet America Recovery Effort (CARE)** - CARE is responsible for working to enhance the collection infrastructure for post-consumer carpet; serving as a resource for technical and economic opportunities for recovered carpet; developing and performing measurements for progress and reporting on them; and working collectively to seek and provide funding towards the group's negotiated outcomes. **Lead-Acid Battery Legislation -** In the case of deposit systems, consumers bring their batteries to retailers and pay a deposit, unless they drop off an old battery. Retailers keep the fee and arrange for transportation and recycling. In the case of advance disposal fees, consumers pay the fee at point of purchase; retailers collect old batteries from consumers, and arrange for transport and recycling of these batteries. **Rechargeable Battery Recycling Corporation (RBRC) -**Manufacturers pay into the RBRC based on the number of batteries they place on the market. Retailers collect used batteries from consumers. RBRC uses the fees to pay for collection from the retailers and recycling. **Bottle Bill Legislation -** Retailers pay a deposit to distributors when beverages are delivered. Retailers then charge consumers a deposit fee upon purchase, and return the deposit upon collection of used containers. Redemption centers refund consumer deposits per each container collected. Retailers and redemption centers return collected containers to distributors who pay them a handling fee and deposit for each container.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
7. What is the distribution of responsibility? (*e.g.* financial and physical, full or partial, etc)	**Thermostat Recycling Corporation (TRC)** - TRC is fully responsible for financing the recycling, physically for recycling; Contractors and wholesalers are responsible for physical collection and transport to TRC. **Carpet America Recovery Effort** - Industry has primary financial responsibility for meeting the goals of the agreement; government has secondary responsibility in terms of maintaining existing disposal programs and promoting procurement guidelines in State agencies. **Lead-Acid Batteries -** Consumers are asked to return their used batteries to the retailer and either pay a fee or deposit at point of purchase (if they are not returning a battery). Retailers must accept the used batteries and collect the fees/deposits. Retailers find recyclers for the batteries. **Rechargeable Battery Recycling Corporation (RBRC) -** Manufacturers are responsible for fully funding the RBRC system. Consumer are asked to return used batteries to the retailers. Retailers accept the batteries. RBRC pays for collecting, transporting and recycling the batteries from the retailers. **Bottle Bill Legislation -** Distributors have most of the financial responsibility - initially collecting a deposit on all beverage containers being sold, and paying out deposits to retailers and redemption centers for redeemed containers at end-of-life. Every player in the product chain, however, has some financial responsibility, through either paying or redeeming a deposit on each beverage container. Logistically, consumers are expected to return containers for redemption. Retailers and redemption centers are required to collect containers and return them to distributors.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
8. What is the estimated number of producers?	**Thermostat Recycling Corporation (TRC)** -The top three thermostat manufacturers (GE, Honeywell, White-Rodgers) created and fund TRC. **Carpet America Recovery Effort (CARE)** - Over 40 producers (over 95% of the carpet manufactured in the US) are participating in the CARE effort. **Lead-Acid Batteries -** Most retailers in the US charge a deposit or trade-in fee, whether voluntarily or as part of a state mandated program, and arrange for recycling of returned lead acid batteries. **Rechargeable Battery Recycling Corporation (RBRC) -** More than 325 manufacturers, resellers and marketers of Ni-Cd batteries and their products are RBRC licensees, representing over 90% of the Ni-Cd portable-powered product industry in the US and Canada. **Bottle Bill Legislation -** All retailers, distributors and bottlers in the ten states and one city.	**TRC** -Over 250 wholesalers and contractors participate in this program nationwide.
9. What are the specific market characteristics? (high turnover, wide distribution, etc)	**Thermostat Recycling Corporation** -Wide distribution. Product life span of approximately 50 years. Over 90% of thermostats are installed by heating and air conditioning contractors. **Carpet America Recovery Effort** - Wide distribution. Product life span of 10-15 years. Large volumes disposed annually. **Lead-Acid Batteries -** Wide distribution, high turnover, profitable end market. **Rechargeable Battery Recycling Corporation -** Wide distribution, high turnover. **Bottle Bill Legislation -** Wide distribution, high turnover rate.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
10. What percentage of the total product market does the EPR programme cover?	**Thermostat Recycling Corporation (TRC)** - TRC operates in all 48 continental US States, but no information on what percentage of contractors participate in collection. **Carpet America Recovery Effort** - The industry participants in this effort represent 95% of the US carpet market. **Lead-Acid Batteries -** Most retailers that sell lead-acid batteries collect used lead-acid batteries. **Rechargeable Battery Recycling Corporation -** Over 90% of the Ni-Cd portable-powered product industry in the US and Canada participates in this industry-funded program. Many, but not all, retailers that sell these batteries collect used batteries. **Bottle Bill Legislation -** Program applies to all sellers in ten states and one city (covering over one quarter of the US population).	
11. Is there a PRO? (If yes, list duties)	**Thermostat Recycling Corporation (TRC)** -The TRC is responsible for managing finances, providing collection containers to participating wholesalers and recycling collected thermostats. **Carpet America Recovery Effort (CARE)** - CARE is responsible for working to enhance the collection infrastructure for post-consumer carpet; serving as a resource for technical and economic opportunities for recovered carpet; developing and performing measurements for progress and reporting on them; and working collectively to seek and provide funding towards the group's negotiated outcomes. **Lead-Acid Batteries -** No PRO. **Rechargeable Battery Recycling Corporation (RBRC) -** RBRC collects fees from manufacturers and arranges for collection, transport and recycling of used batteries. RBRC is also responsible for national education and outreach for the program. **Bottle Bill Legislation -** No PRO.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
12. What is the operational structure? (*e.g.* current infrastructure used, new infrastructure created, combination of both)	**Thermostat Recycling Corporation** -Collected through existing supply chain infrastructure. **Carpet America Recovery Effort** - Will use existing municipal and retail infrastructure, with the goal of expanding collection and recycling of carpet through these systems. **Lead-Acid Batteries** - Existing infrastructure used. **Rechargeable Battery Recycling Corporation** - Collected through existing retail infrastructure. **Bottle Bill Legislation** - Existing infrastructure used, new redemption centers created.	
13. What is the fee payment, or fee structure in place? (How is it organized)	**Thermostat Recycling Corporation (TRC)** -Wholesalers pay TRC a one-time deposit fee of $15 for a collection container. **Carpet America Recovery Effort** - No fees established at this time. **Lead-Acid Batteries** - Consumers pay retailers deposits varying from $4 - $10 when purchasing a battery that is not accompanied by the return of used battery. In states with ADFs, retailers collect a fee of $1 - $3 from consumers on purchase of a new battery. **Rechargeable Battery Recycling Corporation (RBRC)** - Manufacturers pay RBRC a licensing fee (typically 5¢ for cell phone batteries, 10¢ for portable computer batteries, and 4 -12¢ for power tool batteries). **Bottle Bill Legislation** - Retailers pay distributors a 5-15¢ deposit per each beverage container being sold. Consumers pay retailers a deposit ranging from 5-15¢ upon purchase, and can redeem that deposit from either retailers or redemption centers when they return their end-of-life containers. Retailers and redemption centers then return collected containers to distributors and receive a handling fee (typically 1-3¢) and deposit (5-15¢) per container. Money from unredeemed deposits goes either to a state fund, or the distributor, or in some cases both.	**Lead-Acid Battery Legislation** - Battery recycling pays for itself (through the market value of used lead) and, therefore, does not require fees for operation. Deposits are used as an incentive for the "do-it-yourselfers" to return used batteries.

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
14. Are there any targets? (If yes, what is the nature of the targets? What are the criteria for setting targets? How are the targets monitored, and to what extent?)	**Thermostat Recycling Corporation (TRC)** - No set collection or recycling targets. TRC reports annually on the number of thermostats and pounds of mercury collected. **Carpet America Recovery Effort (CARE)** - Targets set for 2012: landfill diversion of 40% ; reuse of 3-5%; recycling of 20-25%; disposal in cement kilns of 3%; and finally, waste-to-energy of 1%. CARE will monitor progress toward these targets through annual reports. **Lead-Acid Batteries -** No targets set. **Rechargeable Battery Recycling Corporation (RBRC) -** To collect as many rechargeable batteries as possible, with a goal of increasing the pounds collected by 10% each year. RBRC reports annually on pounds collected. **Bottle Bill Legislation -** No targets set.	
15. How is information disseminated to affected and interested parties? (method and media used- television, brochures, posters, electronic, *etc.*)	**Thermostat Recycling Corporation (TRC)** - TRC issues press releases, and communicates directly with wholesalers and contractors. Most States disseminate electronic information on the program, including participating wholesalers and contractors. TRC also has a website. **Carpet America Recovery Effort** - There are currently no plans in place for a broad public outreach effort; this may come later. **Lead-Acid Batteries -** Information is presented to consumers at retail stores when they are buying new batteries. **Rechargeable Battery Recycling Corporation (RBRC) -** Television, public service radio announcements, media interviews, press releases, celebrity spokespersons, and articles in general media and environmental publications, retail point-of-sales displays, consumer toll-free help line and the RBRC website. **Bottle Bill Legislation -** Information is disseminated to customers continuously through advertisements, in-store displays, and on containers.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
16. To whom is the information disseminated and how often? (*e.g.* consumers, actors in the product chain, once a year, monthly, *etc.*)	**Thermostat Recycling Corporation (TRC)** -Targets wholesalers, heating and air conditioning contractors, and States in its outreach . Outreach is primarily done when TRC enters into a new area, but is also ongoing. **Carpet America Recovery Effort** - See above. **Lead-Acid Batteries -** See above. **Rechargeable Battery Recycling Corporation (RBRC) -** Information is primarily geared at consumers, with frequent television ads, public service announcements and printed advertising. There are also special events (*e.g.* in 1999, RBRC launched a multimedia campaign in 15 states with low recycling rates). **Bottle Bill Legislation -** See above.	
17. How are existing products treated?	**Carpet America Recovery Effort** - Currently, about 95 % of carpets are landfilled or incinerated. A few companies have their own take-back programs, but overall the recycling rate is low. **Lead-Acid Batteries -** Lead-acid batteries have market value; they are rarely disposed. Any uncaptured batteries are likely still in storage. **Rechargeable Battery Recycling Corporation -** The program has been in place for household rechargeable batteries (from tools, cell phones, toys, *etc.*) since 1993. Estimates vary on how much recycling is being achieved by the program. **Bottle Bill Legislation -** Landfilled primarily, recycling rates are very low.	

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
18. Are orphan products addressed?	**Thermostat Recycling Corporation (TRC)** -TRC accepts all mercury-containing thermostats. **Carpet America Recovery Effort** - Some carpet companies are taking back any brand of used carpeting when they install new carpet. **Lead-Acid Batteries -** Most states requires retailers to accept one used battery for each new battery purchased. Many retailers will accept additional batteries because used batteries have market value. **Rechargeable Battery Recycling Corporation (RBRC) -** RBRC collects all rechargeable batteries. Occasionally, non-rechargeable batteries will be recovered incidentally. RBRC will pay for proper disposal of a reasonable amount of non-rechargeable batteries, however retailers are obligated to try to limit collections to rechargeable batteries.. **Bottle Bill Legislation -** Containers without deposits printed on them and out-of-state containers are not accepted for refund.	
19. How are free riders addressed?	**Thermostat Recycling Corporation (TRC)** -Honeywell, White-Rodgers and General Electric fund TRC completely. **Carpet America Recovery Effort** - Not applicable; there is no central fund at this time to be used to meet agreed upon targets. **Lead-Acid Batteries -** Not applicable. There is a positive market for used lead-acid batteries. **Rechargeable Battery Recycling Corporation (RBRC) -** RBRC has over 325 licensees, constituting almost all of the major actors in the rechargeable battery industry (90-95% of the industry). When a product is collected without the RBRC seal, the manufacturer receives information about the RBRC program and information about how they are in violation of state laws. **Bottle Bill Legislation -** Containers without deposits printed on them and out-of-state containers are not accepted for refund. Violations of the law result in fines (from $100 - $1000).	**TRC** - Some States have asked non-participating manufacturers to join TRC. **CARE** - Non-participating manufacturers constitute only about 5% of the market.

10A. Name of Programme: Product Stewardship (continued)
Country: United States

Aspect	Description	Other Remarks
20. What are the key implementation barriers or issues?	**Thermostat Recycling Corporation** - An early challenge for this program was the absence of uniform regulations regarding handling of these batteries between states. This has been corrected. Attracting participation by more wholesalers and contractors is an ongoing challenge. An important barrier to higher capture rates is that contractors are not required to collect and turn in thermostats, and many lack the incentive to do so. **Carpet America Recovery Effort** - There is currently no funding directly dedicated to reaching the negotiated goals. Participating companies have pledged their commitment, but no funding has been allocated. **Lead-Acid Batteries -** Because recycling of lead-acid batteries is tied to market price of lead, when the price of lead dips, the recycled rate goes down. **Rechargeable Battery Recycling Corporation -** Ongoing challenges include increasing public awareness and convincing consumers to return their rechargeable batteries rather than storing them at home. **Bottle Bill Legislation -** Implementation issues include the type of containers that should be added, how to streamline the process for more efficiency, and who should retain unredeemed deposits.	