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Group on Pollution Prevention and Control

Extended and Shared Producer Responsibility

Phase 2

FRAMEWORK REPORT

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FOREWORD

Many OECD countries — in accordance with the Polluter Pays Principle (PPP) — are taking measures to expand private sector (corporate) responsibility for conserving resources and energy and reducing the quantity of pollutants released and wastes destined for final disposal. This approach of Extended Producer Responsibility (EPR) is aimed at making the private sector responsible for efforts to reduce environmental impacts from both use and disposal of their products and to use and benefit from recycling, recovered resources and reclaimed materials in so doing

In 1994, an OECD project on EPR was initiated, focusing particularly on programmes to address what many regard as the "weakest link" in the product responsibility chain: the final disposal of products after their sale to and use by consumers. The overall themes of each phase under the EPR Project are:

Phase 1	*Review of legal and administrative approaches in OECD Member countries and development of initial policy options for EPR programmes (1994-1995);*
Phase 2	*Analysis of economic efficiency and environmental effectiveness of various approaches to EPR (1996-1997); and*
Phase 3	*Examination of EPR approaches and issues through a series of multi-stakeholder workshops, culminating with a joint workshop combining efforts under EPR and Waste Minimisation OECD work programmes. Synergies are expected and the workshop results will serve as a basis for the development of comprehensive policy options in the form of guidance manual for governments (1998-1999).*

The *Phase 1* Report was based on extensive interviews and information gathered across the OECD area and was published in 1996 (OECD Environment Monographs No. 114, OCDE/GD(96)48).

Phase 2 consists of four areas: *a)* in-depth case studies on existing EPR systems, *b)* possible trade implications, *c)* economic analysis of EPR options, and *d)* development of an overall 'Phase 2 Framework Report' for implementing EPR programmes with a particular focus on the policy and legal considerations for sharing responsibility.

The attached study is the Framework Report for all of Phase 2. The study is mostly developed from a draft report initially prepared by Richard Emory, a U.S. Environmental Protection Agency specialist in international environmental policy and law who has worked in this field for eighteen years. The Report incorporates key findings from the other Phase 2 studies, and includes an annex with brief descriptions of EPR programmes for Austria, Belgium, France, Germany and Japan. The conclusions reflected in this report are subject to further development and refinement as this Project progresses through *Phase 3.*

OECD Secretariat contributors to this final draft include Jan Adams (trade law issues) and Soizick de Tilly (annexed descriptions for France and Belgium). The overall final report has been produced by Fabio Vancini.

Delegates to the OECD Pollution Prevention and Control Group have had the opportunity to peer review this document and have agreed that it should be de-classified.

This document is published under the authority of the Secretary-General of the OECD.

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EXECUTIVE SUMMARY

Background

Extended Producer Responsibility (EPR) is a multi-objective approach that offers several opportunities for innovative advancement in public and private sector environmental governance. This OECD project on EPR, funded by the Government of Japan, takes a focused look at ways to minimise the municipal waste stream by reducing or ending the traditional local-government subsidy, while transferring substantial or complete financial responsibility to private sector enterprises for managing their products also at the post-consumer phase. Phase 2 of the work, reflected herein, attempts to *inter alia*, analyse the shared responsibility that EPR implies, together with the ultimate responsibility of final producers. Whether embodied in negotiated agreements, legislation or industry-led voluntary initiatives, effective EPR programmes have been designed to change the conventional balance of responsibilities among manufacturers and distributors, the consumer and governments. When properly undertaken, EPR's strength lies in its ability to simultaneously operationalise life-cycle thinking, the waste minimisation hierarchy, and the Polluter Pays Principle.

Because most progress to date has been made in the area of packaging, OECD's analysis has mostly used the lessons learned from EPR packaging programmes as the analytical backdrop for undertaking its work. Nevertheless, the principles and interim policy findings **(section 10*)*** that have been developed during Phase 2 of work are constructed to have broader applicability also to other products, including those of a long-life and complex nature. This paper also contains a summary of EPR packaging programmes for *Austria*, *Belgium*, *France*, *Germany* and *Japan* (Annex B).[1]

EPR's Core

EPR is a means to reducing the need for government outlays associated with waste management, i.e., costs linked with the management of products in the post-consumption phase. This would in principle be done by shifting costs from the taxpayers to final producers for *internalisation* into product pricing. **(sections 1.3, 2.3)**. The essence of EPR is who pays for, not who physically operates, the waste management system. EPR provides producers with incentives to reduce operational costs for which they have now become responsible as their products reach the post-consumer phase. The new financial incentives encourage producers to act in accordance with the life-cycle approach to product systems. Producer's actions would be expected to result in the fullest possible achievement of many goals shared by OECD governments:

- waste prevention and reduction;
- product re-use;
- increased use of recycled materials in production;
- reduced natural resource consumption;
- internalisation of environmental costs into product prices; and
- energy recovery when incineration is considered appropriate.

EPR recognises that producers are most able to design cleaner products so as to prevent waste, minimise environmental costs, and incorporate unavoidable costs into the market place.

Material and Capital Flows

For many products, EPR programmes establish new or modified systems of material and capital flows, as illustrated in this report **(section 1.3)**. Moreover, EPR programmes often result in the introduction of what has been termed here corporate "Producer Responsibility Organisations" (PROs), the important new social institutions that are emerging as the key means to the success of individual producers in meeting their collective EPR responsibilities **(section 5)**.

Possible Approaches

There are a number of possible approaches with varying degrees of legal stringency that may be undertaken to implement an EPR system, including industry-led voluntary initiatives, government/industry negotiated agreements, and legislated approaches. Different approaches also exist with respect to EPR targets for waste minimisation and the level of cost internalisation required of final producers **(section 2*)***.

Responsibilities and Activities

The OECD undertook an in-depth analysis of the means for designing an EPR programme that fairly extends and shares post-consumer product responsibility throughout society. Phase 2 has sought to provide a first comprehensive explanation of the nature of responsibilities and activities that can be linked to societal actors throughout both the product and policy life cycle. Major actors which have been assessed include national government authorities **(sections 3, and 8*)***, final product manufacturers and importers **(section 4)**, corporate Producer Responsibility Organisations (PROs) **(section 5)**, consumers **(section 6)**, and local government authorities **(section 7)**. A catalogue and basic description of the fuller spectrum of possible EPR actors, materials and activities is also provided **(Annex A)**.

Future OECD work will likely result in the refinement and adjustment of the proposed catalogue of social responsibilities and actions. OECD's work to date in this context should therefore only be considered indicative, not prescriptive. National circumstances will ultimately dictate the weight placed upon the different actions and duties associated with each actor category. Nonetheless, it seems likely that many or all activities that have been identified will have to be taken into consideration to some degree when designing, implementing and fine tuning an EPR programme.

Maximising Success

In addition to undertaking efforts to that allow for the clear allocation of extended and shared responsibility **(section 3)**, governments can undertake many actions to maximise the chances for the successful implementation by final producers of their ultimate EPR responsibility. As discussed in the paper **(section 8)**, these include:

- Appropriately timing programme implementation;
- Preventing free riding;
- Contending with PROs as potential monopolies;

- Attending to international trade (i.e., law and other) issues;
- Rewarding responsible actors; and
- Undertaking activities to complement and support EPR.

Performance Measures

To facilitate comparisons between different EPR systems, five core performance criteria have been developed, explained and applied **(section 9)**. Briefly, these are:

- Environmental Effectiveness;
- Economic Efficiency;
- Innovative Advancement;
- Political Acceptability; and
- Administrability.

The advantage of the proposed criteria is that they not only facilitate consistent performance assessment, but they can also be more broadly used as central policy considerations for mid-stream adjustment of *existing* EPR programmes, as well as for the strategic planning of *future* EPR programmes. (Work to date on economic efficiency has been mostly qualitative. Phase 3 of this project will allow a deeper consideration of the economics of EPR.)

EPR-specific challenges alluded to above -- particularly the challenge or free riders, international trade issues, and the unintentional creation of monopolies in the form of PROs -- will have a strong influence on the degree to which the five broader performance measures will be fulfilled.

OECD Findings

EPR is a multi-objective approach that offers several opportunities for innovative advancement in public and private sector environmental governance. At the same time, a number of challenges **(section 8)** that EPR poses will require special consideration if its benefits are to be realised.

Phase 2 of the OECD EPR Project has reached a set of conclusions **(section 10)** for further consideration and development during the series of workshops to be undertaken under Phase 3 (1998-1999).

A more extensive Executive Summary for the whole of Phase 2 has been prepared and is separately available [ENV/EPOC/PPC(97)19/REV2].

EXTENDED AND SHARED PRODUCER RESPONSIBILITY :

PHASE 2 FRAMEWORK REPORT

1. INTRODUCTION

1.1 Background

Extended Producer Responsibility is the concept that manufacturers and importers of products should bear a significant degree of responsibility for the environmental impacts of their products throughout the product life-cycle, including upstream impacts inherent in the selection of materials for the products, impacts from manufacturers' production process itself, and downstream impacts from the use and disposal of the products. Producers accept their responsibility when they design their products to minimise life-cycle environmental impacts, and when they accept legal, physical or socio-economic responsibility for environmental impacts that cannot be eliminated by design. [2]

The notion of EPR as articulated under Phases 1 and 2 of this OECD work -- that producers should take more responsibility for cradle-to-grave environmental impacts of their products (particularly including product end-of-life impacts), and that there is a need to internalise externalities to a greater extent in the price of products -- reflects one approach for reducing the environmental impacts of products. A key focus of OECD analysis to date is on the role that producers, acting independently or jointly, can play in improving the environmental attributes of products. The focus on producers does not mean that other actors in the product chain will have no role in achieving desired objectives. Moreover, as explained in this report, there are considerable opportunities, which some Member countries are pursuing, to design EPR programmes that extend and share post-consumer product responsibility throughout society. Extended Producer Responsibility is not incompatible with broader Member country strategies (whether voluntary, negotiated, or mandatory) and tools (economic incentives, informational, other) will achieve desired objectives at the least cost to society and with the greatest benefits to the environment.

EPR programmes change the conventional balance of responsibilities among manufacturers and distributors of consumer goods, the consumer, and the government, particularly with regard to the post-consumer stage of the product's life. They *extend* the traditional responsibilities assigned producers and distributors in the past to include responsibilities for the management of the product at the post-consumer stage. By doing so EPR encourages producers to re-evaluate decisions regarding materials selection, production processes, packaging, and marketing strategies to reduce costs for which they have, for the first time, become responsible when the product reaches the post-consumer phase. This systems, or life cycle, approach to product design and production presents a unique incentive for the producer to act in ways that will promote goals shared by OECD governments: waste prevention and reduction, increased use of recycled materials in production, and internalisation of environmental costs in product prices. [3]

Municipal waste is the only substantial part of the total waste stream that has not been traditionally managed by the generators of the waste, but is managed by governments at the expense of taxpayers. Yet it is producers who are most able to affect product design so as to prevent waste, minimise waste management costs, and incorporate unavoidable costs into product pricing. Thus, by shifting the costs to producers for internalisation in their products, EPR can be viewed as a means to "privatise" waste management and reduce the need for government outlays associated with the management of products in the post-consumption phase. Furthermore, consistent with the results usually seen from privatisation, better waste prevention and management can be expected to be accompanied by increased production efficiency and competitiveness, for both the industries and the countries involved.[4]

In 1994, the OECD began an EPR Project to document and support the development of this promising new instrument. In 1995, the Washington workshop on waste minimisation explored ways to achieve these strategic goals using EPR. In that preliminary work, several fundamental considerations emerged that have guided the subsequent Phase 1 and Phase 2 work, such as:

i) only setting waste-minimisation performance targets through an entire sector range will have a far-reaching impact;

ii) governments should allow the private sector to devise the self-regulating means and solutions to achieve these targets rather than to create detailed government regulations; and

iii) the private sector will be more likely to take effective measures to achieve these targets only when individual enterprises are faced with specific sanctions or economic handicaps for failure to do so.[5]

In 1996, the Phase 1 Report presented the results of an extensive survey of EPR developments in many Member countries and addressed seven key questions. This report offered recommendations for the design of EPR programmes and steps by which governments may support EPR programmes.[6] These recommendations have all been reaffirmed in the Phase 2 studies and are re-affirmed in this Phase 2 Report. The findings reflected in this report are *not the final word* on extended and shared producer responsibility. They are subject to further development and refinement during Phase 3, which will culminate with a joint workshop that combines OECD efforts under the EPR and Waste Minimisation Work Programmes. *Synergies* are expected and the joint workshop outcome will serve as input to the development of comprehensive policy options.

1.2 Scope of the work

This report serves the dual purpose of acting as the framework within which separately commissioned studies fit, and serving as an element toward the development of an eventual EPR implementation guide for OECD Member countries. The separately commissioned work, key findings of which are integrated into this report, consist of case studies on German [ENV/EPOC/PPC(97)21/REV2] and Dutch [ENV/EPOC/PPC(97)22/REV2] EPR programmes, and an unpublished consultant report on EPR take-back requirements and international trade law. Annexed to this report are brief, illustrative descriptions of EPR packaging programmes for Austria, Belgium, France, Germany and Japan.

The EPR notion is seen to directly encompass post-consumer products, product groups or waste streams that, unless covered by an EPR programme, would ultimately form part of municipal waste, i.e. waste collected by or on the order of municipalities. The costs associated with the minimisation and management of wastes that would *not* otherwise end up in the municipal waste management system (e.g.

industrial wastes), are by definition already privatised, or more precisely, internalised, and thus not directly covered by the EPR term. Importantly, the reader should take note that the definition of "municipal waste" varies from country to country. In conformance with the OECD description given in the 1997 Environmental Data Compendium, municipal waste has multiple sources, including not only wastes originating from households, but *also similar wastes* from commerce and trade, office buildings, institutions (schools, hospitals, government buildings), and enterprises.

Extended producer responsibility is believed to be a means toward the realisation of integrated, waste-minimising approaches. This report uses some generally accepted terms for the constituent elements of waste minimisation. In conformance with the outcome of a recent OECD workshop, the term *waste minimisation* is defined as:

- preventing and/or reducing the generation of waste at source;
- improving the quality of the waste generated, such as reducing the hazard; and
- encouraging re-use, recycling and recovery .[7]

Incineration without energy recovery and landfilling are excluded from the notion of waste minimisation as they are viewed as final disposal activities. The often-debated role of incineration *with* energy recovery in the context of waste minimisation is presently being studied by OECD. This report will not enter into discussion about the "optimal waste hierarchy" under different national or local circumstances. Specific definitions and choices to be made concerning the hierarchy of desirable options will tend to vary across countries for reasons such as market, technical, and political feasibility. Countries may debate and legitimately strike different balances among these options.[8]

This report is written broadly in the effort to identify principles and considerations that may be used to create or refine an EPR programme for any product. In the OECD area, most EPR progress to date has been made in the area of waste packaging, and OECD's Phase 2 work therefore has mostly used the lessons learned from packaging programmes as the analytical backdrop for its analysis. At the same time, many of the lessons learned from addressing packaging would seem to be readily adaptable to many product categories, including complex and longer-life products (e.g., cars, electronics). Such products *may* present fewer overall EPR management challenges than does packaging because, although they tend to be individually larger and more composite, they are generally of higher value (suggesting greater incentives to capture their value) and smaller in overall quantity (in this sense, making it physically easier to capture their value). One might reasonably hypothesise that if EPR works for packaging it will probably work for many other products; and if EPR does not achieve desired results for packaging, because of sub-optimal programme design and/or implementation, it does not necessarily mean that it will fail for other products. Subsequent OECD analyses should be able to shed further light on this matter.

1.3 The EPR concept

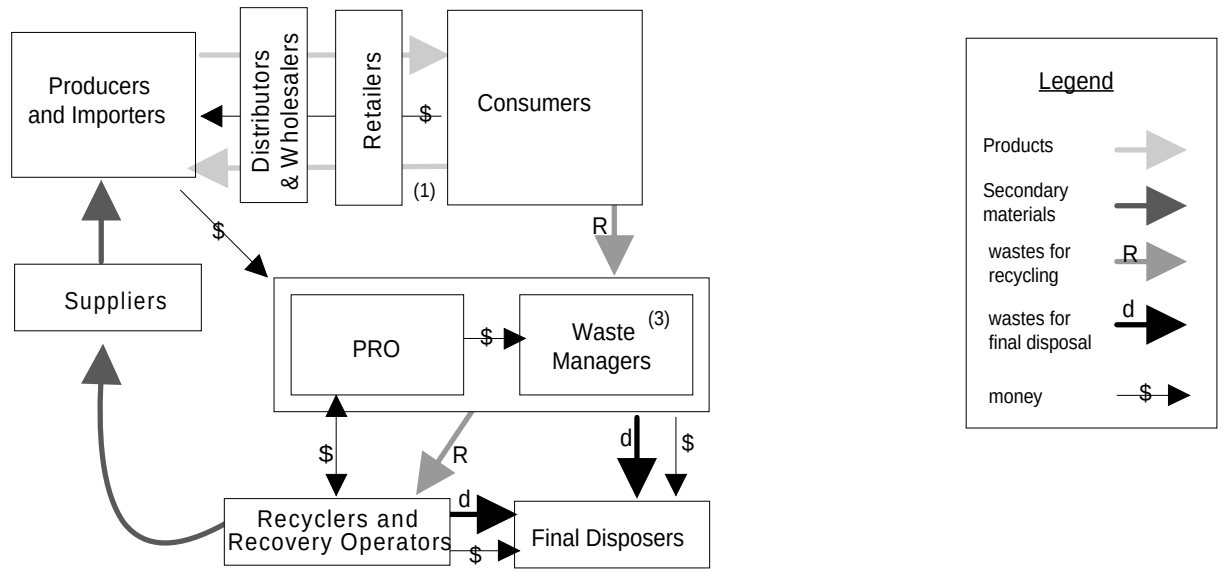
EPR shifts the ultimate responsibility for waste management from municipalities to final producers (including importers). This ultimate responsibility is the duty upon private-sector enterprises to substantially or fully *internalise* waste-management costs associated with their products. This duty is the core, primary, or fundamental element of post-consumer product responsibility. The producers' ultimate responsibility cannot be avoided or deflected. EPR responsibility is not exclusive to final producers. The achievement of EPR objectives will require the collaboration of all of society. Because physical responsibility for the product at different moments in its life cycle is placed upon actors other than the producer, it may not be fully accurate to refer only to "extended producer responsibility", but rather *to extended and shared producer responsibility.* This report will seek to define the "shared responsibility" of

each actor in addition to, or together with, the "ultimate" responsibility of the producer. In a well designed and EPR programme, governments and citizens will not leave producers alone to address a problem that is not altogether theirs.

The figure on the following page attempts to illustrate the path of material and capital flows that would tend to be established under EPR programmes.

In the figure, starting from the upper left-hand corner when products are made, they move clockwise through their life cycle. In the upper right-hand corner, as fully used products reach the end of their useful life, they enter the post-consumer phase, where EPR measures intervene. Consumers return a portion of these products directly to retailers or producers as refillables/re-usables/returnables; the rest may be separated by consumers and are collected by waste managers. EPR measures are fully or partially funded by private-sector payments, which either come from producers who take up their extended producer responsibility, or come from recyclers paying for valuable secondary materials they receive. Where producers pay all waste-management costs, "waste managers" are private contractors or the local authority serving as a contractor of the producers. Where producers contribute a portion of waste-management costs, the "waste manager" and "final disposer" remains the local authority, or its contractors, using a combination of private and public funding. At the bottom of the figure, businesses operating as "recyclers" and "recovery operators" carry out their regular activities as before, and the local authority may retain its role as "final disposer" of the undifferentiated portion of the waste stream that cannot be processed by recycling or recovery, and of final residues remaining from these processes. After producers take financial responsibility and the opportunity to eliminate avoidable costs, fewer post-consumer products stay in the waste stream. A significant result of EPR is that a considerable portion of post-consumer products are diverted from final disposal and instead pass through recyclers and suppliers. The life-cycle is then completed as they return to producers as recycled secondary products or raw materials. In this figure, those managed by "recovery operators" are used to generate energy.

Material and Capital Flows in an EPR System



(1) The side-stream cycle of refillables/reusables/returnables is reflected in a thin "take-back" arrow from consumers to producers.
(2) The Producer Responsibility Organisation (PRO) is the private-sector association funded by producers and importers to assure waste management with recycling and recovery.
(3) "Waste managers" may include private companies or local governments receiving funds from the PRO.

The figure introduces the **"**Producer Responsibility Organisation" (PRO). This is the private-sector organisation of producers and importers that in actual experience is emerging as the means by which individual enterprises may pool and share their responsibilities as producers. As the industry consortium or collective entity that manages the EPR scheme on behalf of its member producers, the PRO is becoming the *key* to the success of many EPR programmes. In some countries PROs are known as "industry exemption schemes", though this term may convey the notion of the absence of responsibility, clearly the opposite of what EPR promotes

When a PRO has been organised to collectively achieve EPR objectives, diversion rates are not directly relevant to individual producers. In this way, an PRO is akin to a "bubble", a concept taken from air pollution control that replaces regulation of every chimney by performance measured according to the average emissions of all chimneys in the "bubble" of the industrial facility or geographic area. The PRO, like the air pollution bubble, is attractive to industry because it allows industry to determine the least-cost ways to meet overall performance goals without the government's micro-management of every source inside the bubble. For producers that do not join PROs, and for producers that exercise ultimate EPR responsibility in the absence of an available PRO or in the event of the failure of their PRO, it may be that the government will also establish individual performance rates. The EPR environmental authority should assure that data on reporting results, both required and achieved, is widely disseminated and made available in both technical and easily understood formats.

2. EPR APPROACHES

This section reviews Member country approaches to EPR with respect to:

- *Form of government involvement:* as reviewed below, there are a number of possible approaches with varying degrees of government involvement and legal stringency that may be undertaken to implement an EPR system, including mandatory, negotiated and fully voluntary methods. Once involved, governments would do well to undertake actions that allow for the appropriate and clear allocation of extended and shared responsibility (see section 3) and maximise the chances for EPR success (see section 8);

- *EPR targets for waste minimisation*: a brief section is provided discussing the nature of EPR targets in the context of waste minimisation;

- *Level of cost internalisation*: as indicated under the explanation of the EPR concept, perhaps the most fundamental issue under EPR is the matter of financing. That is, the essence of EPR is ultimately *who pays* for, not who physically operates, the management of products in the post-consumption phase. As discussed below, Member countries have taken different approaches as to the level of cost internalisation that they require of the private sector for EPR programmes.

2.1 Form of government involvement

Some highly effective, voluntary, EPR programmes have spontaneously generated within some niches of the free market. In some sectors such as automobiles, computers, photocopiers, even rechargeable batteries, commercial cleaning products and floor coverings, product take back exists or is actively developing without government action. From the many examples, two noteworthy ones are the long-standing product take-back programme of the Xerox Corporation, and the newer programme of the nickel-cadmium rechargeable battery manufacturers in the US. Here the battery makers voluntarily formed a PRO and obtained uniform national legislation that protects and supports their voluntary efforts. [9]

It is essential for governments to co-operate with industry to encourage such voluntary and market-driven programmes. Government co-operation should reduce barriers to voluntary programmes, such as lack of understanding of the EPR concept, unnecessary regulatory obstacles, and perhaps lack of infrastructure or technology. While leaving implementation to the creative forces of the marketplace, governments should officially recognise and publicise successes. This will help to expand the social consensus that EPR works naturally, and it will facilitate the application of mandatory or negotiated programmes where they become desirable or necessary.

Voluntary programmes have not worked for packaging, and some other components of the municipal waste stream might be similarly problematic. The history of EPR packaging programmes has shown that entirely voluntary EPR arrangements will tend to have limited success in eliminating the governmental subsidy to the private sector for the disposal of packaging. For example, Germany's 1991 law followed a voluntary approach under a 1986 law, France's 1992 law followed a 1975 law, and Belgium's 1993 law followed an earlier voluntary agreement between government and industry. In these three Member countries, the early, non-mandatory efforts were unable to produce substantial results as requested to reduce the use and landfilling of packaging, and to increase its re-use and recycling. The 1994 EU Directive on Packaging and Packaging Waste (94/62/EC) followed a 1985 directive without

precise quantitative objectives, which was implemented in a very variable manner in those Member States that did not ignore it.[10]

These experiences have shown that entirely voluntary efforts are likely to be limited to a few producers of readily recoverable products, and that a voluntary programme across a product sector will be weakened by producers that opt out and remain beyond the control of the programme's contractual or membership relationship. Domestic voluntary approaches can be undermined by their inability to require the participation of competing importers. Now Germany and the Netherlands are developing legislation to revise their packaging programmes to make them more mandatory, to be more inclusive, and to prevent and control free riders. The EC's Directive for Packaging and Packaging Waste required all EU Member States beginning in 1996 to phase in requirements that within ten years will achieve high rates of recycling and recovery of packaging waste.

This experience is now being repeated for long-life and complex products. For example, in 1996, following industry's failure to take back a wide range of consumer electronic and electrical equipment and appliances on a voluntary basis, the Dutch government announced that producers and importers of such equipment must begin to negotiate a post-consumer product responsibility covenant.[11] Similar developments reportedly are underway in Sweden and under consideration in other Member countries. Most notably, Germany by law has established EPR as a *national vision* extending across product categories. The 1994 "Waste Avoidance, Recovery and Disposal Act" (also called the "Eco-Cycle Waste Act" and the "Closed Loop Economy Law"), effective in 1996, is the framework legislation. It broadly establishes the principle of "product responsibility", authorises national EPR ordinances to be applicable to many products (including imports) sold throughout the German economy, and establishes the obligation to take back products covered by specific ordinances. Germany now is moving to develop such ordinances for a wide range of products.[12] For the EU, the Council has adopted a resolution establishing a European vision calling for the development of the principle of producer responsibility for waste management, which while predominant shall be shared with the other actors in society including consumers and governments.[13]

To establish a far-reaching, widely effective EPR programme involving post-consumer responsibility for certain products, it is likely that official intervention may be needed. This may be either by a law (as in Germany) outlining necessary programme elements and authorising a responsible government agency to provide additional details by regulation (which may well be negotiated), or by a law (as in the Netherlands) requiring a government-industry negotiated agreement to detail the necessary programme elements. Usually by law a governmental agency will be authorised broadly to implement the EPR programme with appropriate co-ordination between national and sub-national levels of government.

The negotiation of agreements or covenants between government and industry can provide an opportunity for all stakeholders to be involved in a process of consensus building. A transparent, inclusive, multi-stakeholder process will facilitate creative, lower-cost, and quicker solutions. The government should allow the private sector to devise the self-regulating means and solutions to achieve the performance goals or targets set by the government, even if the EPR programme is mandatory. Detailed governmental regulations should be avoided as much as possible, except as necessary to empower the Producer Responsibility Organisation to achieve the goals.

Once involved in an EPR arrangement, governments would do well to undertake actions to appropriately allocate extended and shared responsibility *(see section 3)* and maximise the chances for EPR success *(see section 8)*.

2.2 EPR targets for waste minimisation

Upon the determination that EPR will be applied to a particular sector, waste minimisation target are normally discussed and set as part of the programme. Such targets, which can be quantitative or qualitative, have been described in a variety of ways, e.g., performance quotas, rates, objectives, requirements, goals, etc., in relation to the action points of the waste hierarchy. Independent of the descriptor chosen to label the target, it is believed that EPR can facilitate a more systematic achievement of waste minimisation on a micro, meso and macro level. Below is a brief sampling of the nature of such targets.

Waste reduction and waste re-use/recycling/recovery performance rates or quotas may measure both waste prevented and waste retrieved from the waste stream as re-usable products and secondary materials. These performance rates and requirements may be quantitative and perhaps also qualitative, limiting or banning certain hazardous materials. Governments may define the use of waste-to-energy recovery as a partial or conditional replacement, as in Germany, or as a complete substitute for recycling, as in France. Typically, these requirements may be phased in and increase over time.

The Dutch programme has extensive qualitative and quantitative goals to prevent or reduce packaging, to re-use products and materials, and also to conduct life-cycle and market-economic analyses so as to improve planning. While Germany's 1991 packaging law requires only recycling, the 1994 German framework law adds a requirement for waste life-cycle analysis.[14] The French programme has established a goal of 75 per cent re-use/recycling/recovery of packaging by 2002. Japan's goals are now being developed.

Germany's required recycling quota rates are set differently for drinks packaging and for different component materials ranging from glass to plastics and compounded materials. The quota rates are a percentage by weight *(1)* for packaging materials collected from, i.e., divided by, the total amount of packaging materials, and *(2)* for packaging materials sorted or extracted from, i.e., divided by, the total amount of packaging materials collected. All sorted/extracted materials are expected to be re-used or recycled. The original rates were designed to increased steadily over several years.

Although Germany's law sets no waste-prevention requirements, waste prevention is reinforced by the German PRO's private-sector structure of contractual fees to member licensees for its Green Dot product labelling system. Fees are set by weight and packaging material type. Fees are lowest for glass and range up to almost twenty times more for plastic. Even without such a fee-based incentive and in the absence of a mandated waste prevention goal, internalisation of the costs of recycling should lead to waste prevention as a rational way to minimise recycling costs. If recycling becomes so highly profitable as to "discourage" some forms of prevention, this may have implications for the need to reconsider the establishment of official prevention targets.

In actual start-up experience, the German collection system for packaging waste was perhaps too successful. More packaging was collected that could be handled by the domestic recycling system, which expanded but more slowly. The initial recycling quota rates had been set very high, and it was no fault of the PRO that they could not be met. After the glut and troublesome exports of collected materials were recognised as problems, the EPR government authority decided that it would be necessary to reduce many recycling quota rates and to slow their rate of increase for several more years to allow recycling capacity to grow. Waste-to-energy incineration is allowed for wastes for which recycling capacity is not sufficient.

Article 6 of the EU Packaging and Packaging Waste Directive sets quantitative goals for recycling. This was based on the theory that this would lead to waste prevention without specific

requirements. However, the EU Directive does not prevent the setting of national waste prevention targets.[15] More controversial is the EU Directive's requirement that there be maximum (and minimum) national recycling performance limits, a provision that was opposed by Germany, Denmark and the Netherlands.[16] But the EU acted so that an average Member State's likely domestic capacity to absorb recycled materials will not be exceeded. Moreover, EU dispensations upward from "maximum" national goals are allowed on reasonable conditions, including that there be adequate domestic recycling capacity and that exports are avoided. Conversely, temporary dispensations downward from "minimum" national goals are established for some countries (Greece, Ireland, and Portugal).[17] Finally, the EU's minimum requirement of at least 15 per cent recycling of each packaging material will exert upward pressure on countries that currently incinerate almost all plastic packaging, such as France and the Netherlands.

When recycling objectives are established as part of an EPR programme, consideration will have to be given on how to best treat the cost of recycling. The challenge will likely be different for different types of products. For example, the issue of who pays for the recycling of end-of-life products may be much less complicated for short-lived products, such as packaging, than for long-life products, such as electrical appliances or automobiles. Certain long-life products will have been manufactured before the relevant EPR programme came into effect, and the issue of who should pay for the recycling of those products will likely require further analysis to arrive at efficient solutions. These issues will be explored more fully during OECD's Phase 3 EPR workshops.

2.3 Level of cost internalisation

Perhaps the most fundamental issue under EPR is the matter of financing. Indeed, the essence of EPR is ultimately who *pays for* the operation of, *not* who physically operates, the waste management system. As discussed below, Member countries have taken different approaches as to the level of cost internalisation that they require of the private sector for EPR programmes. In the EPR context, the relative implementation of the Polluter Pays Principle would seem to be proportional to the degree of cost internalisation required of and/or undertaken by the private sector. Having said that, the complete 'privatisation' of the financing of post-consumer product management would tend to maximise the private sector's incentives to reduce waste.

In a *full-cost-internalisation* EPR system, as illustrated by the German packaging system, producers and/or their PRO take from the local authority full financial responsibility to manage covered products at the post-consumer stage. In the words of the 1991 German Packaging Ordinance, manufacturers and distributors shall re-use or recycle their packaging "independently of the public waste disposal system". In such a system the local authority's subsidy to the private sector would end and financial responsibility will not be shared. However, the local authority shares non-financial/physical responsibility in ways that support EPR. In the German variation of the figure from the previous section, "waste managers" are private contractors, or the local authority serving as a contractor of the PRO. However, depending on programme design, the local authority may continue as the "final disposer" of the undifferentiated portion of the waste stream that cannot be processed by recycling or recovery.

On the other hand, some countries have chosen to implement their EPR programmes with *partial cost internalisation.* Typically in what may be called the "French model" or approach, the private sector must cover any extra cost of recycling, but not the cost of collection, which remains both the financial and physical responsibility of the local authority. For example, the French, Belgian, and Japanese packaging programmes require that the private sector contribute this much toward the total cost of municipal waste management. Spain, Greece, Portugal, and Italy are tending to follow the French approach. This has the advantages of minimising market and social disruptions, while still creating for the private sector an

organised PRO and a financial stake that is absent in the traditional system of a full municipal subsidy. In the French variation of the figure from the previous section, the "waste manager" and "final disposer" remains the local authority (or its contractors), assisted by PRO financial contributions to increase recycling. But to the extent that a local authority shares the financial responsibility for waste management, it reduces the incentive on producers to take all steps to achieve the highest possible levels of waste prevention, separate collection, re-use, recycling, and desirable recovery that only they can accomplish.

In another approach, illustrated by the Dutch packaging system, while the private sector makes no monetary contribution directly to the municipalities, participants may nonetheless internalise some costs directly. Dutch companies have worked together within a PRO, emphasised company-by-company packaging redesign to prevent waste, and co-operated closely with government authorities to increase the rates of re-use/recycling/recovery to meet established goals. This partial approach has worked remarkably well in the Netherlands, a small nation with a large population that enjoys a high level of social consensus. But where the local authority continues to finance waste management fully, with no specific, identifiable financial contribution from the private sector, it is not clear that the Polluter Pays Principle has been applied to waste management as it might otherwise be.

In the future, each country implementing EPR may wish to consider carefully the level of cost internalisation that might undertaken for EPR programmes. This consideration no doubt will be affected by the degree of success that is perceived to have been enjoyed by those countries where the costs associated with post-consumer product management have been fully internalised into product pricing by the private sector.

3. EXTENDING AND SHARING RESPONSIBILITY

The following sections will elaborate on the design elements that are believed to be important when attempting to create a successful EPR programme. This report will also describe some areas where change or clarification of existing programme elements my be needed before there can be fully successful implementation of EPR.

Successful EPR programmes will normally have many elements in common. This will be so regardless of whether the programme is established by legal mandate or negotiated agreement, and whether costs are totally or partially internalised. This report will describe the standard actors that will have responsibility within an EPR programme for products that might otherwise eventually become part of the municipal waste stream disposed of at the expense of taxpayers. While this report has been written to cover all "products", it also covers packaging itself as a kind of product. Always with a focus on the legal and policy issues inherent in "shared responsibility", this report will describe both the legal requirements to be implemented by the responsible actors and also recommended additional measures that are supportive of EPR. The programme described will be a structural abstract of the actors and functions that are common to an effective EPR programme in which there is widely shared responsibility. This paper proposes a generic framework for consideration when allocating EPR roles and responsibilities to each actor as a link in the product chain, so as to forge the final link between the recycler and the product manufacturer and its suppliers that completes the product life cycle. Free-rider issues and legal solutions will be explored. Monopoly issues will be identified, and international trade issues will be taken into account.

3.1 Extension of the legal concept of ownership

Under conventional pollution control regulation, the discharges, releases, and emissions of product manufacturers are controlled by end-of-pipe and end-of-stack limitations on polluting constituents. The inevitable potential to pollute is present in useful products from the beginning when they are "discharged, released, and emitted" into economies as they leave their manufacturers' premises in shipments on the way to consumers. The later problem, when evident as municipal waste, cannot be managed at the producer's factory using conventional regulation by the techniques of pollution control. Moreover, the traditional municipal waste management techniques of landfilling and incineration have been meeting some strong resistance in many OECD countries EPR is a new technique that provides a means for substituting activities of waste minimisation for the traditional techniques. The legal requirements attending a pollution prevention programme such as EPR will necessarily differ from those of a familiar pollution control programme.

Even under conventional legal principles, a manufacturer by selling a product usually cannot transfer from itself all responsibility for dangerous product liability. A manufacturer selling pesticides must label its pesticide products to provide instructions so that they are properly handled or applied by users at the end of products' consumer life. A producer generating hazardous waste may be required to do even more, i.e., retain full management responsibility appropriate to a waste that possesses a dangerous, polluting potential as the waste leaves the factory in shipments to off-site treatment, storage, and disposal facilities. EPR has a partial analogue in a pesticide manufacturer's responsibility to provide information that may assure proper end-of-product-life management of the product, and also in the responsibility of a producer of hazardous waste to actually assure proper end-of-life hazardous waste management, which in time and place may be remote from production.

To meet the requirements of conventional pollution control regulation, product warranties and liabilities, pesticide safety and hazardous waste management, producers for many years have internalised the costs of necessary pollution control equipment, liability insurance, and the other expenses of exercising responsibility. For the costs of municipal waste management associated with their products, EPR will require that producers do the same. In an EPR system that fully internalises costs, EPR will fundamentally change some familiar logistical and legal arrangements.

For waste management purposes, products that were sold will instead be regarded at the end of useful product life *as if they were leased*. EPR provides that a producer will retain or regain ownership of its products during their post-consumer phase, even if the products in fact were not leased at the time of the end of their useful life. Technically, the producer that sells its products will retain a "reversionary" or "future" ownership during the time of consumer use. At the end of product's consumer life or at the beginning of the post-consumer stage, this future ownership matures into a present ownership of "ultimate" post-consumer product responsibility.

This ownership carries both EPR responsibility and the opportunity to profit from the value inherent in the possibility to re-use/recycle/recover the products. The 1991 German Packaging Ordinance did not define "ownership", and initially this may have impaired the ability of producers and their PRO to establish their entitlement as owners to receive revenues from the sale of collected secondary materials. However, the 1994 German framework law entitled the "Waste Avoidance, Recovery and Disposal Act" (27 September 1994) broadly establishes the principle of product responsibility (Art. 22) and the obligation to take back products covered by specific ordinances (Art. 24). Also, at about the same time a European Commission cartel complaint charged the German PRO with supplying collected materials to contractual waste managers without charge. Beginning in about 1994, the German PRO has begun to charge waste managers for the materials they receive from the PRO. Now the German PRO is beginning

to enjoy profits from the sale of ownership as a new, second source of revenue. This revenue supplements the substantial Green Dot licensing fees charged as membership assessments.

Although some products will become unidentifiable as such or lost into the waste stream from which they are not recoverable, under EPR all reasonable efforts should be taken to prevent this, with the goal that there be no products without a final producer that retains ownership of the product's EPR responsibility. (Relatedly, it will be important to identify the scope of the final producer's EPR responsibility for end-of-life products that come into his possession, but which he did not actually produce. This would include consideration of responsibility for orphan products where the original producer no longer exists. This may be particularly relevant to long-life, complex and high-cost products). Other actors in a system of shared responsibility, notably consumers and local authorities, must assist producers. But local authorities will no longer "own" the entire problem of waste management, and in a fully implemented EPR system the local authorities will own none of the problem in financial terms.

Ownership, once begun, must also have an end. Under EPR, the post-consumer product ownership and EPR ultimate responsibility of the original producer may only be avoided or ended if:

1. the product is destroyed during its useful life in the possession of its last consumer;

2. the product is sold or otherwise transferred by its last consumer to another producer (usually of re-used or recycled products) that takes over EPR responsibility for the product;

3. the product at the end of its consumer life is mismanaged by the consumer by finally disposing of it to the waste stream from which it is not retrieved; or

4. the product at the end of its consumer life is properly separated by the consumer, collected and managed pursuant to EPR requirements.

A well designed, fully implemented EPR programme will define (*1*), (*2*), and (*3*) above, by which the original producer terminates any product ownership interest and avoids EPR responsibility. Only (*4*) will involve the original producer again with present ownership of the product. The producer may end this ownership only by exercising EPR responsibility.

3.2 Providing for responsibility that is extended and shared

EPR is about responsibility that is both extended and shared among producers and beyond by producers with consumers, governments, and other actors across society. This responsibility is shared in all stages of a product's life cycle and not just in waste management. In a well designed EPR programme, governments would usefully seek to define clearly, or support the clear delineation of, the shared responsibility of each actor in addition to or together with the ultimate responsibility of the producer, so that producers will not be left alone to address a problem that is not altogether theirs. Shared responsibility is only a useful concept if the individual roles and responsibilities are carefully defined by law or agreement for each actor, especially where there may be an overlap or concurrence of responsibilities or a transaction that may alter or shift responsibility. This is necessary to reduce barriers to EPR that may arise if there is uncertainty in the meaning of shared responsibility. This report seeks to define the shared responsibility of all actors in addition to or together with the producer. A fully implemented EPR system will most often be described, *while recognising* that countries may choose to

only partially implement EPR by having the local authority continue to share a portion of the financial responsibility to assure post-consumer product management.

In any fully implemented EPR programme, the final producer's post-consumer ownership of its product confers ultimate responsibility throughout the post-consumer phase. But the producer needs the shared help of the consumer and of the local authority to place the post-consumer product in the recycling chain. Usually the producer will not have a contractual relationship with the last consumer of its product, so that only the relevant government authority can require that all consumers separate and otherwise handle the products responsibly. Producers may also need the help of an PRO to organise all such corporate actors within their sector in a shared, collective effort to handle their individual responsibility with efficiency and fairness among all PRO members.

Shared responsibility sometimes also may be used to refer to the careful co-ordination that is needed between the existing municipal or local authority and each new PRO. Even the partial substitution of the new PRO financial link for the old local authority financial link is an act of intervention and responsibility of government itself, and it is here that new mandates and requirements may be needed. For any local authority, EPR may be phased in on a sector-by-sector basis, and for each product sector there may be a separate PRO. Thus the overall financial responsibility of the local authority would be reduced gradually as PROs begin either to physically handle post-consumer products and residues, or at least to assume some or all of the costs thereunder. Meanwhile, the local authority will continue to have a substantial role operating in parallel for product sectors where there is yet no PRO to replace the local authority, and the local authority may continue also to handle the PRO's waste, either as its contractor or as the recipient of its financial contribution.

Programme designers must also address the question of whether the local authority will retain full responsibility for the undifferentiated waste stream remaining after the separation of products covered by the responsibility of PROs. PRO responsibility could also be defined to encompass the unretrievable portion of the undifferentiated waste stream allocable to the products of the PRO's members, on the theory that costs attributable to all of its products should be internalised. But in practice, this seems generally to have remained both the physical and the financial responsibility of the local authority, apparently on the theory that the public should pay for the waste management of post-consumer products that cannot possibly be retrieved by the private sector.

3.3 Catalogue and definition of terms

Vague or inappropriate definitions will cause confusion, inequitable allocation of costs and benefits, and resistance that may cause the failure of an EPR programme, no matter how well intended or much needed. It will be the responsibility of government and responsible actors participating in programme design to assure the clear and equitable definition of roles and responsibilities among all, including those actors who may be inclined to compete to shift or evade responsibility at least as much as to co-operate in EPR, and who may even be motivated to generate uncertainty or loopholes in EPR requirements.

Below and in Annex A is a discussion of key terms which responsible EPR programme designers will probably need to consider, including *(a)* actors in a system of extended and shared producer responsibility, *(b)* covered products and wastes, and *(c)* covered activities between actors. The definitions, briefly introduced below, are intended to be applicable for all products, as well as those of a long-lived and complex nature.

A successful EPR programme will identify the actors likely to be present in the life cycle of the covered product, and will identify the missing or inactive links. An EPR programme will often result in the creation of new actors (such as the PRO) and assign to all actors new functions, roles, and responsibilities. The EPR programme thus will supply missing links and reinforce weak links so that there is a strong and complete product responsibility chain during the entire product life cycle.

In a mandatory programme, it is necessary to identify each actor's relationship to a particular product or product application, so that an actor's EPR responsibility as to that product or product application can be clearly delineated and explained. This is particularly so with regard to defining the *final producer* whose responsibilities, while shared, are ultimate. A definition of final producer could be designed to apply the Polluter Pays Principle only to the actor(s) best placed to prevent and manage wastes. For example, this definition may exclude upstream recyclers and suppliers from the ultimate EPR responsibilities that are appropriate only for final producers, because only the makers of final products are able to redesign products or to order and purchase waste-preventing parts and other ingredients from suppliers. With regard to packaging, countries may choose and could specify whether a producer of packaging is a supplier to a final producer or is itself a final producer. Germany's 1991 packaging ordinance and Japan's 1995 container and packaging recycling law both include some or all packaging manufacturers as final producers having ultimate EPR responsibility for their packaging.

For packaging, Germany's broad definition of persons with ultimate EPR responsibility included actors from the producer of packaging to the filler of packaging. As is elaborated below, Germany created a sort of broad bubble definition within which a free-market definition of focused ultimate responsibility could and did occur. Surprisingly, it appears that the final producer of the product that goes into the packaging and who usually orders the packaging may not be expressly included in the group, unless the final producer is also the filler. Germany also imposed ultimate EPR responsibility downstream on retailers, including mail order firms, thus covering the packaging in the form of store bags and mailing containers. Yet despite overall success, Germany has suffered a very substantial free-riding problem among manufacturers and distributors. There is some uncertainty as to who really must pay Green Dot licensing fees and PRO membership assessments that fund the entire programme. Failing popular pressure for EPR and industry co-operation in setting up an effective PRO, an unmanageable situation could have occurred, but it did not.

Overall it must be observed that a definition of final producer that includes downstream retailers has functioned well in the German packaging experience. Here there seems to have been a well calculated legislative intent to put pressure upon retailers by subjecting them to burdensome deposit-and-take-back ultimate responsibility, unless waste-minimisation goals are met collectively. This caused the retailers to use their tremendous market-access power to put contractual pressure on users of packaging material -- in particular, fillers upstream from retailers -- to meet collective goals. This clever approach found an economic pressure point within the bubble that relieved somewhat the need to rely on a tight definition of the group of ultimate producers. From the German experience it has been learned that it will be particularly important in EPR packaging programme design to clearly define whether retailers, who control market access for many products, and fillers, who may not actually make the product enclosed by their packaging, are or are not final producers.

Similarly, the 1991 Dutch Packaging Covenant defined the packaging chain to include waste manager, recyclers, and suppliers of raw materials for packaging. Such a broad definition was well calculated to apply the Dutch concept of chain responsibility, to facilitate application of life-cycle analysis, and to work well in a small, rather homogeneous nation with a history of social co-operation.

To define the group with ultimate responsibility so broadly can create a group that is unmanageably large so that it may be difficult to impose legally binding responsibility on many who should bear it. Free riding has been a big problem in both Germany and the Netherlands, detracting from otherwise successful programmes. Countries may want to consider more narrowly targeted definitions that focus on a quite manageable group. In an effort to prevent uncertainties as to who is included in the ultimate group, and thus to reduce future administrative difficulties with the control of free riding, this report will offer a generic, yet more focused, definition of final producer. Ultimately, the definition *should be tailored to the situation*, being sure that all paths for free riding are blocked. This may not be easy, because human ingenuity knows few limits. For complex products, the annexed definitions necessarily leave unanswered many questions, such who is a final producer with ultimate EPR responsibility in the case of *(a)* new and reconditioned replacement automobile parts sold to consumers and incorporated into their automobiles, or *(b)* the large aggregation of products in mobile home and boat building and the construction of new homes and buildings. But only when complexity has been faced, and when definitions have eliminated many uncertainties and opportunities for evasion, may the governmental authority proceed with confidence to establish its affirmative and negative programme requirements.

EPR strategies can be applied to any number of products or parts of the waste stream. The second part of Annex A includes definitions for covered products and wastes as a proposed checklist and framework for programme designers when undertaking to fully delineate covered products and wastes.

The final section of Annex A offers definitions to describe events, acts, or transactions, collectively called “activities”, that may have important implications in EPR programmes. An activity may shift in whole or in part responsibility between actors in connection with the flow of products, materials and money. The following activities are not listed alphabetically, but in the usual chronological order that such activities occur in the life cycle of a product beginning with the creation of the product by its final producer.

4. ROLE OF THE FINAL PRODUCER

4.1 Ultimate financial responsibility for assuring waste management

To the extent that the law requires, the final producer shall “own” the financial responsibility for assuring EPR management of its products beginning at the end of product’s consumer life at the beginning of the post-consumer stage. Assuming that a final producer wishes to contract away all or a portion of its individual responsibility, the producer can become a member of its sector PRO. Consistent with the membership agreement, each member producer would be responsible for paying to its PRO its proportionate share of the cost of waste management for its products. The PRO’s assessment would not include an amount allocable to that portion of its products that is likely to be taken back directly and individually by the producer, but the PRO’s assessment would include an amount allocable to the portion to be managed collectively by the PRO. Consistent with specific performance goals, the PRO’s membership assessments may well be related to the member producer’s level of use of certain materials, such as quantity and type (based on difficulty of recycling) of packaging, and/or of virgin materials. Such fees can provide strong incentives for waste minimisation activities that will lower waste-disposal costs for members and their PRO.

To avoid a separate fee charged to consumers, the producers may choose simply to pay their EPR assessments from the cost of goods sold or leased to consumers; this was the choice that producers and distributors made under the packaging laws of Germany and France. Alternatively, the financial

responsibility may be met with funds obtained from a separate EPR fee charged to each consumer for each covered product. If such a separate fee is to be imposed upon consumers, producers and their distribution chain may need to obtain from the EPR environmental authority or local authority the legal right to impose such a fee. With its distribution chain, each producer may find it necessary to contract appropriately to assure the payment of all EPR-related fees back to itself or to its PRO.

Final producers may be required to guarantee the performance of the PRO, and, in the event the PRO fails to meet established goals and is disqualified, to perform additional, contingent obligations as specified. These obligations could include large payments to the local authority if it must manage post-consumer wastes collectively in the absence of a responsible PRO.

4.2 Ultimate physical responsibility for post-consumer products

An EPR law or negotiated agreement typically calls on final producers to meet all programme goals for re-use/recycling/recovery, and perhaps for waste prevention, of covered products. There may be an explicit, general responsibility to physically take back all covered products, and other specific measures such as to provide suitable collection containers for consumers to return products free of charge at or near the point of sale. There may be a deposit-return scheme imposed on liquid foodstuffs in disposable, non-re-useable drinks/beverage packaging, and perhaps also on containers for other products such as washing and cleansing agents and for emulsion paints. Both of these measures are part of the packaging laws of Germany and France. Belgium chose to threaten an "eco-tax" on beverage containers and certain other packaging. Still another approach is the *required* producer self-assessment, by life-cycle analysis (LCA) coupled with market economic analysis (MEA), under the Dutch packaging covenant. This offers a means to foster technological innovation, waste prevention, and better control of packaging costs, and can make it easier for producers to meet their post-consumer product responsibilities.

Careful attention should be paid to the problem of "similar products" and "orphan products" of other manufacturers that have reached end of product's consumer life and may come into the possession of a *different* final producer or its distribution chain. In this area, legal requirements probably will be necessary, at least for such products that are different enough to present difficulties and high costs to recyclers. If these such products have been precisely defined by law, the producer's responsibility for their handling will be clear, and a well designed programme will provide credit for responsibly handling the products of another. To achieve physical responsibility for similar and orphan products, a producer should be sure that its contractual relationships with its distribution chain expressly cover these products that will have to be handled by "take back" even though they may not have been distributed through the chain.

When beginning an EPR programme for long-life products, careful attention should be paid to the challenge of responsibility assignment with respect to "existing products". These are products that, inherently, cannot be redesigned for waste minimisation because they are already in the production process, distribution chain, or consumer use.

Additional requirements upon the final producer — regarding product and process design to achieve waste prevention — may become less necessary where conventional disposal has been valued using unit-based, full-cost pricing, or where numerical recycling rates are mandated, and where free markets are working well. The final producer can be expected to act in its own self interest to contract appropriately within the new EPR reality. This will include contracting with the producer's downstream distribution chain to require it to share in the management of any individual post-consumer product responsibility, and contracting with the producer's upstream recycling and supplier chain for the purchase

of waste-preventing supplies of raw materials, parts, and products that are re-usable, recyclable, or made from ingredients that are.

Often, of course, producers can legally avoid all or a portion of their individual post-consumer product responsibility — they will elect to establish PROs to manage responsibility collectively. (The Dutch were fortunate already to have had a well-established PRO, formed early to deal with recycling issues and in existence for about twenty years before their 1991 packaging covenant.) EPR laws typically are designed very intentionally to encourage PRO formation. In Germany, for example, the private sector successfully avoided the difficulties at individual retail stores of managing returned packaging and also of charging for drink containers a high deposit (starting at 0.5 DM for individual-sized drink portions) to be refunded upon return of the container. With complete freedom from the government as to the particular design of their own "third party system", German packaging manufacturers and distributors organised and operate their own PRO that is entirely responsible for the collection of covered packaging waste.

4.3 Other responsibilities and recommended activities

Producers could be required to self-monitor performance in meeting EPR requirements, to create and maintain accurate records, and to report data and results to government and the public, either directly or through their PROs. This information could be provided in formats that are both sufficiently detailed to assist policy makers and understandable by the consuming public. Producers could be required to retain their records for a sufficient period of time and to make them available to the PRO's internal accountants and to governmental authorities that may have reason to verify the integrity of the data.

Additional elements of an EPR programme may be optional with the producers and their PROs. Possible "EPR certificate or labelling" programmes (such as the Green Dot) to stimulate consumer preference, and possible innovative labelling programmes to facilitate post-consumer product processing and accounting, are likely to be collective activities. These are discussed below as recommended activities of the PRO.

5. ROLE OF THE PRODUCER RESPONSIBILITY ORGANISATION (PRO)

An extended producer responsibility law or negotiated agreement will typically provide that a final producer's individual, ultimate responsibilities are removed by exemption, if the final producer belongs to a PRO that collectively performs its members' responsibilities. The key words of exemption of the 1991 German packaging law are that the above obligations (individually to take back packaging and to impose a deposit-refund system) *"shall not apply to manufacturers and distributors who are party to a system which guarantees regular collection of used packaging from the final consumer or, to an adequate extent, in the vicinity of the final consumer throughout the catchment area of distributors"* and which meets other EPR requirements including managing all collected packaging independently of the public waste disposal system. Assuming that enough final producers wish to contract away all or a portion of their individual responsibility, they will design and establish their PRO. In this context, the PRO will either replace the local authority and have the full physical and the financial responsibility for assuring EPR management of its members' products, or the PRO will contribute funds to the local authority to perform these activities.

Under the 1991 German packaging law, "PRO" was not defined, although the 1991 law hinted at the possibility of a PRO by stating that manufacturers and distributors may call upon "third parties" and join "a system" to fulfil their individual EPR requirements. With almost complete freedom to the private

sector to design and operate its own PRO, packaging manufacturers and distributors established the "Duales System Deutschland" (DSD) as their ultimate PRO to replace the local authority. Germany's 1994 EPR framework law began to define the PRO and to subject it to specific requirements to protect the transfer of a public function to private hands.[18] Under the 1992 French packaging law, the private sector established Eco-Emballages to collect Green Dot fees from members and to contribute to the local authority.

With respect to packaging wastes, Japan and the Netherlands have taken other approaches. The Japanese PRO (the Japanese Container and Package Recycling Foundation) will neither finance nor operate waste collection, but it will financially support waste recycling as required by national law. The Dutch PRO (the Foundation on Packaging and the Environment (FPE)), encourages but neither finances nor operates waste management. Thus the term "PRO" may be extended to encompass an organisation such as the Dutch FPE that is effectively supporting and organising industry to meet collective social goals (for example, through representation during the EPR policy development stage and subsequent monitoring of implementation), though its members may not be subject to legally binding or ultimate responsibility and it may not necessarily be involved with overseeing or financing waste management. The Dutch FPE, in addition to packaging makers, fillers, and users, also includes waste management firms, recyclers, and suppliers of raw materials for packaging. While such inclusiveness is consistent with the Dutch concept of "chain responsibility", a PRO with such wide membership may reflect an absence of legally binding responsibility on final producers. Not all Member countries may enjoy the widely shared social values and cohesion that has allowed the Dutch Packaging Covenant to achieve the success expected of a mandatory programme, even though legally it may be less than mandatory. Nevertheless, the Dutch approach has enjoyed success in a densely populated nation with a high level of social cohesion. For the same reasons, no less success can be predicted for the new Japanese programme.

5.1 Collective financial responsibility for post-consumer products

The PRO may replace the local authority as the source of funding for the waste management of the products of its industry sector, either entirely as under the German packaging law, or partially by making a financial contribution to relieve the local authority of extra costs of recycling, as under the French and Japanese packaging laws. To do this, the PRO may obtain funds from members' assessments and from recyclers' payments for the valuable materials that it controls.

5.1.1 PRO revenues from members' assessments

The PRO may assess each member its proportionate share of the cost of post-consumer management of its products. Members' assessments may or may not (depending on programme design) be paid as licensing fees for the use of the PRO's "EPR certificate" or "EPR labelling" system designed to increase consumer preference for, and post-consumer responsibility for, EPR-compatible products. The PRO's assessment would not include an amount allocable to that portion (of all its products) that is likely to be taken back directly and individually by the producer, but the assessment would include an amount allocable to the portion to be managed collectively by the PRO.

In packaging programmes including those of Germany and France, the ultimate means of the PRO to finance packaging waste management is by licensing its "Green Dot" trademark. In becoming a member of the PRO, a producer contracts to apply the Green Dot to its packaging, provides to the PRO a guarantee from a recycler that its type of packaging will be recycled, and pays to the PRO the licensing fee for its annual production level. There is no separate charge to the consumer. The fee is included in

the cost of goods sold and may be passed on to the consumer in higher prices. Despite the increase in costs of goods sold, the Green Dot system has met with wide acceptance — in Germany, most retailers will not sell packages without the Green Dot. "EPR certificates" or "EPR labelling" such as the "Green Dot" are not the same as "eco-labels", although there is often confusion between them. The EPR label is supposed to be only a guarantee either that the labelled product will be taken back or at least that a portion of the cost of the product is prepaid to a system to achieve its take-back. The EPR label may be placed on environmentally questionable products (such as non-refillable, one-way containers) and does not necessarily mean that the item itself is environmentally sound. The German DSD no longer claims that its Green Dot identifies packages that are good for the environment.[19]

In a well designed arrangement of PRO member assessments or fees, these are at least partially avoidable costs that a member may substantially reduce by engaging in the desired activities. This is particularly important for a fully cost internalised programme. Membership fees must be set at a high level to pay for the full cost of post-consumer waste management, which is entirely the responsibility of the PRO. Originally, the German fees were imposed on members based on the volume of each package, but because container volume can only be expected to grow with sales, the original fees offered no incentive or opportunity to a member to reduce its PRO assessment.

In 1993, Germany made an important corrective revision to provide avoidable-cost opportunities. Fees were revised in part to be a function of the weight of the package but mainly to differ for each material (increasing with difficulty of recyclability). The revised fees are calculated so that for packages of equal volume the fee is less to package goods in, for example, glass (most easily recyclable and having the lowest fees) than to package in plastics and compounded materials (most difficult to recycle and having the highest fees). In 1994, the 1993 fees were retained with a further adjustment being made to include an additional charge per package, to reflect the higher cost of handling each of many small packages. In actual experience, the post-1993 German fees are believed to encourage companies to reduce the overall weight of packaging, to reduce the number of unnecessary small packages, and to switch to packaging materials that can most easily be re-used or recycled. Member countries may be well advised to follow the German model in providing incentives for producers to simultaneously cut costs while reducing landfilling and incineration.

French Green Dot licensing fees and the Japanese fees (without Green Dot or other product marker) are set at a much lower level and paid to cover only the extra cost of recycling (but not collection, which continues at the expense of the local authority). To the extent of this private-sector contribution, the traditional public subsidy for waste management is reduced. In France, the level of the fees and contribution are designed only to remove any disincentive that the local authority may have to act to encourage re-use and recycling. This disincentive exists in the somewhat lower cost of waste-to-energy recovery that does not require separate collection. The disincentive is removed by paying to the local authority the extra cost of separate collection activities (the amount above the cost of waste-to-energy recovery) so as to equate the cost of the two means of waste management. The local authority remains fully responsible for financing waste management to the level of the cost of waste-to-energy recovery, and these costs are not shifted to the private sector for internalisation in packaging costs.

For rigid, hollow containers, the French Green Dot fees are based only on container volume, which can only be expected to grow with sales. These Green Dot fees are not differentiated by materials based on ease or difficulty of recycling, and they are not related to weight of material used. Considering also the low absolute level of the French Green Dot fees, it is unclear that in their present form they offer significant incentives to producers to engage in waste prevention, re-use, and recycling. However, French Green Dot fees are planned to increase, and they may be redesigned at any time to become partially

avoidable costs that offer savings sufficient to encourage and reward desired behaviour by the private sector.[20]

5.1.2 PRO revenues from recyclers' payments for valuable materials

The PROs and their member producers can be expected to observe or track closely the supply and demand of the post-consumer markets and to devise new commercial strategies as required to meet their established EPR performance goals at the lowest cost. PROs will tend to establish new contractual requirements upon waste managers or recyclers, extracting payments from them when demand and prices are high for its members' owned secondary materials. Yet these payments should be low enough to assure the flow of retrieved secondary materials from recyclers through suppliers back to final product manufacturers, and the recovery of waste as energy where and to the extent that this is authorised by national choice.

With clever contracting, inefficiencies in the system can be addressed. For example, the German PRO sought to enlist waste managers to detect consumers free riding by mixing non-EPR wastes (to avoid the local authority's per-bin garbage fee) in with products that are collected by the PRO's waste managers without charge. To do this, the PRO changed the basis for its contractual payments to waste handlers from overall weight of material collected to weight of material after sorting. This gave the waste managers the financial incentive to help to exclude useless material from their collections.

However, a PRO may experience the inadequacy of its contractual controls and inspection mechanisms in dealing with waste managers and recyclers that, for example, may take and fail to pay for valuable secondary materials or pay too little for them, may improperly dispose of hard-to-recycle products, or may falsely report results. If the expected application of PRO self-interest proves inadequate to the economic power and behaviour of the recycling chain, it may be necessary then to reconsider programme design. Enhancements could include government intervention as needed to develop new legal prohibitions and to authorise the EPR environmental authority to directly enforce against those in the recycling chain that persist in conduct that tends to undermine EPR. These prohibitions would cover skimming and underpaying for valuable materials, product dumping, and false reporting to the PRO of information that it needs to establish its revenues or to report to a governmental authority.

In the initial operations of Germany's packaging programme, PRO-sorted packaging was provided to recyclers without charge. Because of the sudden oversupply of collected materials, it was impractical for the PRO to sell the secondary materials derived from packaging. However, the PRO announced in October 1994 that it intended to charge its waste managers and recyclers for secondary raw materials with a positive value (such as metals and glass). DSD stated that it intended to use the new income generated from sales of valuable materials to help to fund its management of wastes with a negative value (such as some plastics and composites), and as markets stabilised eventually to reduce Green Dot fees to members.

The French PRO, Eco-Emballages, has negotiated fixed prices that recyclers must pay to the local authorities that control the delivery to them of collected and sorted packaging from which they derive secondary materials. The goal of this system is to create a steady market for recyclable materials that will reward local authorities. These materials payments to local authorities from recyclers, in combination with the payments from Eco-Emballages of its direct contributions to local authorities of Green Dot fees collected from packaging companies, are planned to be sufficient to encourage a significant increase in re-use and recycling. This effort is also supported by a tax on waste disposal by landfilling, which is raising funds to be used for new, modern waste management facilities. The

effectiveness of these financial measures will be determined as the French programme expands and intensifies its efforts over the next five years.

5.2. Collective physical responsibility for post-consumer products

To the extent that final producers do not meet individual goals for product take back and recycling that have been established by the EPR environmental authority, it will be the responsibility of the PRO, as the agent for its members, to assist them to do so. The PRO's activities include encouraging consumers to properly separate products, and assuring or contributing to their collection, the processing of the waste stream to the extent feasible to retrieve additional products, and their management thereafter in accordance with EPR requirements. Responsibility also includes assuring the proper disposal of any residues, from re-use or recycling of products for which the PRO's member-producers are responsible, that finally must be landfilled or incinerated.

In arranging for collection and other waste handling activities, the PRO should take care not to disrupt existing structures (including collection programmes by local authorities) and markets that are operating well, and not to impose duplicate waste management and processing costs. Under Germany's Packaging Ordinance, instead of contracting with the local authority to collect separated packaging as part of its regular residential collection, in most sub-national units the PRO chose to set an entirely independent, "dual" system of residential collection using its own trucks. These operate in parallel with the local authority's trucks that collect non-packaging residential waste. While this system has been effective, the cost of operating a dual system is under review. In contrast, the French system, which contributes additional financing to the local authority to support separate collection in a way that seeks to achieve greater re-use/recycling/recovery, has made no other change in the physical responsibility of the local authority for waste management.

5.3 Other responsibilities and recommended activities

With regard to free riders, any membership organisation can require by its membership contract that each member meet certain standards; professional associations often perform such a quasi-public function of self-regulation, and so may PROs. Anti-fraud contractual requirements have proven necessary to enable PROs to act against free-riding activities such as false use of an EPR certificate or label without payment of licensing fees or membership assessments to the PRO. A membership organisation can enforce standards by a "peer review committee" or other body of the membership or management empowered to impose additional measures such as increased oversight, a probationary term of membership, monetary penalties for infractions, and ultimately suspension or even dismissal from membership. With encouragement from government authorities, the PRO may use these methods first to prevent free riding among its membership and those who do not even join. For example, the German PRO has hired accountants to review its members' books. Totally fraudulent "members" have been detected by member retailers that are encouraged to identify (and report to the PRO) any products appearing on their shelves bearing the Green Dot that are from manufacturers not on the list of Green Dot licensees. Certainly PROs and their responsible members will usually know best the identities of those in their industry that are not complying with EPR requirements and thus are perhaps obtaining an unfair competitive advantage. They will have every motivation to use self help to bring all competing producers within the programme, and if necessary then to identify continuing noncompliers to government authorities.

Depending on national law, a PRO may or may not be required to undertake public education efforts to increase consumer participation. To increase consumer participation, the PRO's programme may (as in the Green Dot countries of Europe) or may not (as in Japan) include an EPR certificate or labelling scheme such as the Green Dot. Modern commercial advertising has enormous ability to shape consumer preference for and sales of EPR-friendly products, as well as consumer participation in product take back or separation that are key to the success of the PRO in keeping costs down while meeting the goals of the EPR programme. Manufacturers paying EPR member assessments can be expected to quickly realise that trumpeting their good deeds will increase their product sales and/or collections (producing economies of scale in waste management). The German PRO has an active media campaign, that has changed the PRO's image from one of industry-serving to public-interest. Manufacturers should need little encouragement from governments to support EPR public-relations programmes.

International harmonisation of national EPR requirements is another area where PROs should need little encouragement to work with governments and with existing voluntary organisations that operate as standardisation bodies. Harmonisation upward will create more efficient industrial practices and enhance the international competitiveness of domestic manufacturers. Harmonious EPR standards may cover matters such as: *(a)* design to facilitate re-use and recyclability, *(b)* labelling to facilitate the foregoing and encourage consumer preference, *(c)* inclusiveness to assure reasonable treatment of unusual (and often foreign) products and packaging, and *(d)* payment of EPR charges on imports and allowance of credits on exports. While these efforts are already ongoing, nation-wide PROs could emerge as powerful catalysts to international progress.

6. ROLE OF THE CONSUMER

6.1 Financial responsibility for assuring waste management

EPR is premised on the belief that it is more efficient, environmentally and economically, for consumers to pay for waste disposal in relationship to product pricing than as taxes or fees paid to local authorities that are unable to redesign products and minimise waste. In any event, either under EPR or not, it is inescapable that costs are always passed on or back to the consumer/taxpayer, who inevitably pays for waste management. EPR programme designers should consider wisely how to best impose on consumers their underlying financial responsibility for achieving EPR goals.

At the point of consumer sale (or lease) from a final product manufacturer, retailer, or other actor in the distribution chain, if required and in the way required, a consumer of a covered product may have to pay to the party providing the product an "advance disposal", "deposit", "eco-tax", or other charge or fee to finance the post-consumer management of the product. If such an EPR fee is to be imposed, then to assess the fee at the point of original sale is administratively the most simple and effective way. At this point the consumer clearly wants to receive the product and cannot get it without paying the fee. Depending on market conditions and EPR programme design, the consumer may even enjoy at the time of product "take back" an incentive such as a next-purchase credit or the return of all or part of the deposit paid.

To impose a separate fee later at the time of disposal, as some producers have urged, may provide an incentive to consumers to engage in fee evasion. This may take the form of refusing to return or separate products, hiding products in the undifferentiated waste stream, or undesirable "back-yard" burning or dumping of products in hidden places. For some replacement products that may only be installed commercially (such as vehicle tires, but not necessarily batteries), items (such as motor vehicles)

for which registries are maintained for reasons other than EPR, or items (such as long-life electrical appliances) that retailers usually reclaim when selling new ones, this problem may be reduced by requiring product take back, proof of proper disposal (by issuing an EPR disposal certificate), or payment of an EPR disposal fee to obtain a replacement item. For other products for which a separate fee is postponed to the time of disposal, there can be extra administrative costs in *(a)* relating two transactions (the disposal of the old product to obtaining the replacement product), *(b)* certifying first-time product buyers (who necessarily would lack an EPR disposal certificate because they had no former product), and *(c)* assuring proper disposal by last-time consumers (who do not want to buy a replacement, do not need an EPR disposal certificate, and have no incentive to pay any fee required for EPR disposal). For those products, such a system may be challenging to manage, with high administrative costs and free riding that would reduce fee collections and re-use/recycling/recovery rates.

Instead of charging an identifiable, extra EPR fee at the point of consumer sale, no identifiable extra payment may be required of the consumer, and the cost of EPR simply may be internalised by the producer and "hidden" as part of overall product pricing. This has been route chosen in Germany and France. The low cost of administering this approach is an important consideration.

Consumers may experience an economic benefit, as EPR requirements would tend to reduce the volume of their waste that receives conventional disposal and thus the waste management-related taxes or fees now paid for conventional disposal by the local authority. On the other hand, for what waste is still disposed conventionally despite EPR, consumers may well be required to pay increased taxes or fees on a unit basis (such as a per-bin garbage fee) that fully accounts for true cost of conventional disposal. Internalisation by consumers of their own waste management costs will parallel and reinforce the ultimate responsibility of producers to do the same.

6.2 Physical responsibility for post-consumer products

At the end of product's consumer life, in the ways or methods acceptable within the national culture and as required by the local authority, a consumer of a covered product must *(a)* separate or remove the product from the aggregated waste stream and make it available for separate collection, *(b)* transport and deliver the product to a place of collection, or *(c)* take back the product to a participating responsible retailer.

Engaging the increased participation of consumers is essential to the ultimate success of EPR that will need the sharing of responsibility far beyond producers. Indeed, recycling often is not possible without maximising efficiency in the separation of wastes. Consumers can expect to receive from the other key actors (producers, PROs, and local authorities, depending on their respective competencies) a combination of incentives and requirements all designed to cause consumers to take physical acts that divert their products from traditional waste disposal. This may include governmental action designed to prevent consumer evasion (free riding). Consumers may be subjected to action by local authorities for failure to appropriately participate.

The 1991 German law placed no responsibility on consumers, whose co-operation was assumed. In Germany, popular enthusiasm for "green" behaviour including recycling has risen to very high levels. There is a very high level of voluntary participation in the key activities of consumer "take back", "drop off", and separation for collection. However, into the PRO's curb-side bins consumers also have deposited quantities and types of packaging and other materials that the PRO did not intend and was not prepared to manage. Where the wrong materials were deposited in the PRO's curb-side bins, consumers may have acted either out of confusion, or a "free-riding" desire to avoid fees charged on regular garbage

bins, or a combination of the two. One remarkable example of mass citizen action is that the Association of German Housewives itself has undertaken a national campaign to end confusion by neighbours and to detect and report abuses of the Green Dot programme.

7. ROLE OF THE LOCAL AUTHORITY

7.1 Relationship to the consumer

In close consultation with the PRO, waste managers, and other actors in the recycling chain, a local authority could require and prescribe the ways or methods by which, at the end of product's consumer life, a consumer of a covered product would act with regard to the product. The consumer should: *(a)* separate or remove the product from the aggregated waste stream and make it available for separate collection, *(b)* transport and deliver ("drop off") the product to a place of collection, *(c)* take back the product to a participating responsible retailer, or *(d)* otherwise handle the product to meet EPR goals. To encourage such desired behaviour by consumers, local authorities may well consider the economic instrument of a volume-based charge, such as a per-bin garbage fee, for non-EPR waste that must go to disposal, provided it is combined with enforcement measures to prevent free-riding (avoiding the charge by burning or placing non-EPR waste in EPR collections).

For those citizens who do not respond appropriately to waste policies, enforcement has traditionally been the responsibility of the local authority, and under EPR this should not change. Inevitably, to counteract avoidance at end of product's consumer life by consumers of their physical responsibility for their products, it will be necessary for local authorities to enforce requirements that consumers within their jurisdictions comply with their responsibility for their products. A few well publicised cases should be enough to convince most consumers to comply with their new responsibilities under a well designed EPR programme. In Germany, although there is no national law placing responsibility on consumers, some local laws prohibit placing recyclable materials in the regular garbage (undifferentiated waste) bins. To increase the incentives on local authorities to act to improve consumer behaviour, there is consideration of a proposal to revise the national law to require that a local authority take from a PRO, and manage free of charge, all non-packaging household waste placed improperly in the PRO's collection.

7.2 Relationship to the PRO

The local authority also should work almost in partnership with the PRO and waste-management contractors to redefine the role of the local authority in an EPR system. This is especially true in a fully implemented EPR programme in which producers and their PRO have the entire financial responsibility to most efficiently assure the return of their post-consumer products to the recycling chain. However, even the full financial implementation of an EPR programme does not necessarily mean that the local authority's responsibility for physically managing waste must change substantially.

7.2.1 Co-operation on financial measures

The essential financial shift under EPR is for the local authority to be funded partly, entirely or replaced altogether by the final producers or the PRO organised by them. This may be accomplished for the complete post-consumer management of products of the relevant industry sector as under the German

packaging law. Or, as under the French packaging law, the local authority may receive from the PRO a partial financial contribution for the management of these products. Under either approach, the local authority may take useful steps to assist the PRO with its new financial responsibility.

With regard to funding the PRO's new role in organising waste management, it may be best to simply internalise the cost of EPR in product pricing. This avoids the substantial administrative costs of requiring and imposing a separate "advance disposal", "deposit," "eco-tax", or other charge or fee (usually at the point of consumer sale or lease). However, programme designers may wish to nevertheless use such a separate charge or fee. A decision to finance the consumer's EPR responsibility in this way would only be made in close consultation with the PRO, final producers, and other actors in the distribution chain, the EPR environmental authority, and the local (or higher) government authority. The PRO then may need official authorisation to impose the fee upon consumers. If so, the appropriate level of government authority should authorise and require the ways or methods by which a consumer of a covered product must pay the EPR fee, and also how the collected funds shall be paid to or for the benefit of the final producers and their PRO. In the way that is familiar to governments imposing sales or value added taxes within their jurisdictions, it will be necessary to enforce these requirements on retailers and others in the distribution chain who may be reluctant to collect or hand over collected funds to or for the benefit of the PRO.

To avoid double charging, a local authority should reduce or credit any fees or taxes for conventional waste disposal paid to it by citizen consumers -- and by responsible producers that now under EPR will take back or collect and recycle products in the place of the local authority. The alternative is a doubling of waste-management costs to citizen consumers -- and to responsible producers that will tend to push them unnecessarily to increase their product prices. Where the PRO actually takes over physical responsibility from the local authority, the local authority should reduce its costs by steps such as moving from bi-weekly to weekly collection of its non-PRO or garbage bin. The failure by local authorities to address double charging will seem unfair and be seen as a government barrier to the implementation of EPR.

With such legal and technical assistance as may be obtained from higher levels of government, a local authority may wish to consider implementing unit-based, full-cost pricing for conventional waste management, and publish results. Such full-cost accounting information would seem to be a prerequisite for higher success under the Polluter Pays Principle; municipalities would no longer undervalue and thus partially subsidise conventional disposal. This information can be useful for a number of purposes. The local authority may choose to publish cost results in connection with its sponsorship of "good citizenship" campaigns to stimulate participation in take back and separation. Consistent with these full costs, a local authority may consider setting fees or taxes for the use of the local authority's or its contractor's waste collection, management, or disposal by landfilling, incineration, or any means other than re-use/recycling/recovery. When consumers or residents pay for conventional garbage collection and disposal based on the amount of such waste that they generate, as compared to a flat fee or property tax that provides no incentives to individual behaviour change, suddenly consumers will act to minimise waste. The effects should include increased consumer preference for low-waste purchases, participation by residents in separation, and product redesign by manufacturers. To achieve such ends, the EPR environmental authority usefully may conduct waste-stream studies, develop models, provide technical assistance to local authorities, and if necessary provide national legislation to establish unit-based, full-cost pricing for conventional waste management. [21]

A local authority could institute for itself a product procurement policy that gives preference to products made from re-usable and recyclable materials, parts, and products. Assistance may be obtained from the higher levels of government that are revising procurement specifications to increase the capacity

to absorb such products. The leadership of the higher levels of government in establishing new procurement specifications will be of great technical assistance to many local authorities. This will increase market demand for, and help to prevent, a possible oversupply of recovered material

7.2.2 Participation in physical responsibility for waste management

Under EPR, the local authority may continue to operate physically almost as before. Even in a fully implemented EPR programme, where there is no continuing local-authority subsidy to the private sector, the local authority will continue to have financial responsibility for wastes from other sectors where there is as yet no EPR system, and probably also for the undifferentiated waste stream remaining after the separation of products covered by EPR. Where the local authority operates as collection contractor for a PRO in a fully implemented EPR programme, or as the recipient of a financial contribution from a PRO as in France, the local authority's physical responsibility and operations may continue very much as before. These operations would be changed only by an increase in separated collection and by the hoped-for reductions in incineration without recovery and in landfilling. In ways that best suit local conditions and as set by law or agreed upon in contract negotiations by the local authority and the PRO, it may be appropriate for the there to be, for example, (1) continued collection by a local authority, after which the collected post-consumer products are made available to recyclers, (2) provision by the local authority of a place and storage for post-consumer products dropped off by consumers, from which the accumulated items are made available to recyclers, and (3) conventional disposal by the local authority of final residues left over from recycling.

8. MAXIMISING SUCCESS

As already discussed, once involved in an EPR programme, the EPR environmental authority would do well to undertake actions that allow for the appropriate and clear allocation of extended and shared responsibility (see section 3). At the same time, the EPR environmental authority has the duty to confront possible barriers in an effort to maximise the chances for the successful implementation and performance by the final producers of their ultimate EPR responsibility. As reviewed below, this includes:

- Appropriately timing programme implementation;
- Preventing free riding;
- Contending with PROs as potential monopolies;
- Attending to international trade (i.e., law and other) issues;
- Rewarding responsible actors; and
- Undertaking additional activities to support success.

8.1 Timing of programme implementation

The timing of programme implementation is a key consideration that has been approached differently in a number of countries. Programme designers may wish to consider both the pace of the start up of any programme, and the expected lifetime of the products to which a programme applies.

In the German packaging experience, political and public pressures forced the PRO's system to be implemented nation-wide before the EPR environmental authority had planned. Quickly more waste was collected than could be managed by the existing recycling system, which caused a number of serious problems.[22] Markets for secondary materials tend to be volatile, and typically as more waste is collected there will be a decline in the value of recovered materials accompanied by an increase in the marginal

costs of collection. In the German experience, both effects were large. A lesson from this experience is that it should be less destabilising to implement EPR more gradually, perhaps by sub-sectors and/or geographic areas. Nevertheless, in the German programme the private sector ambitiously and quickly did take and exercise full financial and physical responsibility for Germany's packaging waste.

In comparison, the 1992 French EPR packaging programme is being implemented over eight years, beginning with prudent study of a number of diversified, local pilot projects affecting about 5 per cent of the national population. The gradual French effort has not caused a collapse of French markets for secondary materials, and there has been no high-cost duplication of the existing collection capacity of municipalities. Following the passage in 1992 of the French law and its comparatively smaller and cautious implementation beginning in 1994, the full impact of the French programme as presently planned will not be clear until 2002.

An intermediate rate of programme implementation is illustrated by the 1995 Japanese packaging programme. From 1997 it applies nation-wide to large companies for glass and PET bottles. In 2000, it will apply nation-wide to all companies and also for other packaging including cans, paper, and other plastics.

For packaging[23] and especially for products more durable than packaging, programme designers are challenged to establish the scope of a final producer's responsibility for existing products that cannot be redesigned. During the start-up, transitional phase of beginning an EPR programme, it must be clear exactly what is an "existing product" and whether it is "covered" or subject to the new EPR requirements on the day they take effect. The very brief definition of "existing product" given in Annex A will need substantial elaboration to achieve fairness and certainty during programme start up.

8.2 The challenge of free riders

Generally, "free riding" is the failure or refusal to comply with an EPR programme requirement. Free riding may be done by an act of evasion or falsification, by an omission, failure, or refusal to act in a way that is required, or by any combination of acts or omissions contrived to achieve a free ride. Widespread free-riding has been described in even otherwise successful EPR programmes for packaging of Germany and the Netherlands, and may be worse in other countries. This endemic problem suggests that everywhere there are opportunities for improvements in EPR programme design.

In Germany's 1991 packaging law, some common or serious types of evasion or falsification were identified and made the subject of specific prohibitions as "administrative offences". In summary, the defined key offences are: failure of any person:

1. where a deposit is required, to levy or reimburse a deposit;

2. to provide clearly visible and easily accessible collection containers;

3. to accept returned packaging; and

4. to re-use or recycle independently of the public waste disposal system.

Japan's 1995 packaging law identified some additional key violations. In summary, the key offences are failure of a packaging manufacturer, filler, or PRO:

1. to maintain and retain required account books (or making false entries in them);

2. to make required reports (or making false reports); and

3. to allow a required inspection.

However, a number of additional forms of evasion, falsification, or free riding, have been observed, many of which may not yet have been defined specifically as offences.[24] These include:

1. PRO-member producers failing to pay, or underpaying, their PRO membership assessments (such as their Green Dot trademark fees), and false reporting to the PRO of information that determines its membership revenues or that it is to required to report to a governmental authority;

2. importing companies applying the Green Dot in the nation of manufacture to products that are transported to another nation where the products are consumed and must be managed as waste, without complying with that nation's EPR requirements such as payment of its Green Dot fees;

3. consumers buying across the border in a non-EPR jurisdiction and personal "importation" of products that do not comply with domestic EPR requirements such as payment of EPR-related fees applicable to imports;

4. consumers failing to separate products from the waste stream, or even intentionally mixing non-EPR wastes in with waste that are collected without charge by the PRO;

5. waste managers and others in the recycling chain "skimming" (removing and recycling to their own account) valuable products such as aluminium cans from waste collected for the account of a PRO, underpaying for valuable materials, and false reporting to the PRO of information that determines its revenues from materials sales or that it then is required to report to a governmental authority; and

6. waste managers, and others in the recycling chain, falsely reporting to the PRO that collected waste was handled in conformance with EPR programme provisions, when in fact it was landfilled, incinerated without recovery, or exported to a nation that will finally dispose of the waste in an environmentally unsound manner.

To partially counter Green Dot problems that reduce its revenues, the German PRO has hired accountants to review its members' books, but this will have no effect on non-members, and neither for members or non-members was such conduct specifically prohibited by the 1991 law. The German PRO also has hired technical inspection agencies to review the behaviour of its contracted waste managers, to make sure that collected waste is actually re-used/recycled/recovered and that the results are not reported falsely. While false reporting may have been made the basis for contractual penalties and disqualification by business decision from PRO contracts, such conduct also was not prohibited by the 1991 law.

Once free riding is well defined and specifically prohibited by law, the next step to preventing free riding is to establish the institutional authority and capacity to act against free riders. There should be some programmatic means to detect and respond to violations. EPR laws or negotiated agreements should contain clear requirements for self-monitoring, to include the self-creation and self-keeping of accurate records, and self-reporting by producers to their PRO and the EPR environmental authority at least on an annual basis. As a matter of contract with its membership, the PRO may to impose self-monitoring requirements and obtain the authority to inspect and copy records. In addition, the EPR environmental authority itself should monitor the quality of such data received, and should develop an appropriate plan for the detection and prevention of false or inadequate reporting as a form of free riding. For the EPR governmental authority, new legislation may be needed to enable it to require self-monitoring by PROs

and their members, to obtain the inspection authority needed to enforce requirements designed to prevent free riding, and if necessary to punish falsity and evasion.

Programme designers may wish to consider carefully the proper role of PROs (private companies) to assist in the implementation of EPR programmes, and the role for government in the implementation of EPR systems so as to better enforce against free riders. PROs can be expected to have an important supporting role, by disciplining (probably with contractual penalties) or even denying PRO membership to producers that would not participate fairly, by imposing contractual requirements on waste managers, and by reporting free riding to government authorities for legal action. But a PRO will be helpless against non-members, and its contractual control over its members and powerful waste managers may be inadequate. For example, in Germany and Austria, there has been a serious problem of non-payment of Green Dot fees, that has undermined the financial strength of the PRO, but the 1991 German packaging law did not define this failure as a violation of a governmental requirement.

Between the EPR environmental authority and the local authority, roles and responsibilities should be divided and assigned. Many countries may find that it will take a national or powerful subnational environmental authority to establish prohibitions, (negative requirements) into law, monitor behaviour, and if necessary to take any necessary legal action against individual companies. Sometimes, enforcement may even be necessary against PROs themselves. It well may be that a local authority is not the right unit of government to be expected to take action against a powerful PRO or its contracted private-sector waste manager(s). Together with the PRO the local authority may be operating almost as a partner, potentially as the contractor (waste manager) to the PRO and/or as the recipient of its financial contribution. On the other hand, the local authority would seem the right level of government to act against free riding by consumers.

The official response to an apparent instance of free riding may begin with the provision of assistance to the non-complying actor to help the actor achieve the required performance. Such compliance promotion may consist of education regarding requirements and ways to meet them, technical assistance organising PROs, financial assistance to small businesses, and even authorising exemption from prescriptive programme requirements for responsible actors that commit to experiment with new approaches that may more readily achieve the overall performance results required. Governmental authorities should be responsive and open to flexible collaborations with other actors of demonstrated responsibility. These collaborations should be expected to lead to the redesign of EPR programme requirements, including the redefinition of measures of success and of free riding, to more accurately reflect what is achievable based on actual experience implementing EPR.

In the implementation of EPR, as with any programme, there will come a time when the programme's measures of success and requirements are clear and widely known. Still there may be free riders that will not respond to compliance promotion methods, who are repeat or intentional offenders, or whose violations are serious. Seriousness may be present in violations that demonstrate extreme departures from requirements, cause environmental harm, or cause economic harm to competitors that are behaving responsibly. The EPR enforcement authority should have the capacity and sophistication neither to overreact nor to underreact, while preserving the governmental discretion and flexibility to achieve the right response for each situation. Ultimately, the most serious violators will have to be punished if EPR responsibilities are to be legally binding and if EPR is not to revert to being an ad-hoc programme from which any actor may opt out. Governments that widely publicise their corrective and punitive actions will change the behaviour of those actors who have waited to see what will be the official response before they determine to participate in EPR or to improve their level of compliance. As former or potential violators would see the wisdom in compliance with EPR requirements, the rate of voluntary compliance would be

expected to rise, the rate of free riding would be expected to fall, and the EPR programme would be more likely to achieve its objectives.

8.3 PROs as potential monopolies

A number of economic and ultimately legal issues of market or business concentration may be related to the activities of the PRO. National governments may find themselves challenged by EPR to reconcile internally, or to integrate, their environmental policies and competition policies.

First, there is the problem of often new, usually small or medium sized enterprises (SMEs) that are final producers. The requirement to participate in an EPR programme can represent an obstacle to market entry for SMEs, particularly to foreign-market entry. These obstacles may be overcome by assuring that PRO membership initiation and participation fees are not disproportionate to an enterprise's size, and if necessary that even extra assistance is provided to facilitate the entry and participation in PROs of SMEs, both domestic and foreign. The overall goal is to assure that every PRO is operated in a non-discriminatory manner by being open to all applicants and to all products, based on qualifications that are not anticompetitive.

Within the consortia of producers and retailers that allocate the costs and benefits of participation in an EPR programme among the various members, there may be opportunities to share pricing data so as to increase costs to the public at large. There may also be opportunities to allocate costs and benefits so as to disadvantage small or unfavoured members and thus reallocate market share. For example, where a PRO sets membership assessments with rates that vary based on use of different packaging materials (with higher charges upon packaging that is more difficult to re-use/recycle/recover), manufacturers of highly assessed packaging or products may be put at a competitive disadvantage. This then may be partially offset with a 'competitive advantage' in the form of a subsidy to reduce recovery costs. Both of these effects have been observed with regard to the difficult plastics problem.

Within the waste management business, there is the central issue of the effect of large PRO contracts in driving out small waste management firms that cannot qualify to manage large contracts that tend to be long-term and exclusive for geographic market areas. From increasing market dominance by the largest waste management companies, the expected results would include excessive waste management charges that would be borne by PROs and passed on by them to be shared by their member producers and consumers buying their products. Indeed, regarding many of the markets that form the links between members of the entire recycling chain (see definitions in Annex A), there is concern that there may be collusive self-contracting that may lead to highly "inbred" and monopolistic systems. Moreover, where dominance is achieved in one market, it may then be used to try to leverage dominance in a different market.

Anticompetition concerns do not appear to be different for PROs than they are for other trade associations that routinely engage in contracting for their memberships. In many countries, such dangers are managed by awareness and avoidance of what constitutes illegal conduct. Trade associations operate widely in compliance with national laws, which prohibit collusion that would deny the market entry of new competitors, allocate exclusive markets, fix prices or quotas within a market, use dominance in one market to dominate another, or otherwise cause an unlawful restraint of competition.

With reference to the German packaging programme, the national government's cartel office has been concerned with the tendency to *monopolisation of demand* (for waste management services) by the

PRO (DSD), and to the *monopolisation of supply* by the few waste managers capable of handling a very large contract.

Some corrective steps have already been taken. The German government closely scrutinises the activities of the waste collector/management company that within a geographic market area receives what in effect a monopoly position by contract with the PRO. To prevent self-contracting in the first post-consumer market, " with regard to participation [in PROs], waste management firms, including recyclers, are generally excluded from decision-making bodies because of the potential for price fixing during the negotiation of contracts. " [25] Furthermore, the German government has prohibited the same PRO from expanding its existing operations both into (1) other commercial and industrial sectors for used sales packaging, and into (2) the collection and management of transport packaging. These prohibited expansions were seen as the use of dominance in one market to enter another market where the likely effects would have been the large-scale elimination of small and medium-sized waste-management companies.

In addition to concerns described above that encompasses the waste collector/manager's market as contractual manager of waste for the PRO, concern extends to the subsequent post-consumer markets that involve recyclers. This concern encompasses both the recyclers' initial market role as purchasers of waste (containing secondary materials) from the waste collector/manager or PRO, and the recyclers' post-processing market as sellers of secondary materials to the packaging industry. Among recyclers, as with any industry, there is always concern about setting quotas or fixing prices among themselves, but with German packaging recyclers there is also a special concern. Many German recyclers were newly created by the waste collectors/managers or by the packaging industry seeking to increase capacity to process collected waste packaging. These relationships present an increased possibility that recyclers may serve as purchasing cartels of the packaging industry, as sales cartels of the waste collector/managers. An additional possibility is that the recyclers may just work for their own excess profits. Because the German PRO acting as collector originally provided valuable sorted material to the recyclers at no cost, a cartel complaint was filed by the EU against the German PRO. As a result, the PRO has regained some independence from the recyclers, that now must pay the PRO for its deliveries to recyclers of collected materials that have a positive market value.

8.4 International trade issues

8.4.1 Trade law

Post-consumer product responsibility programmes have already given rise to some tensions and concerns in international trade. The most well-known examples are deposit/refund schemes for refillable beverage containers; and the impacts on importers and on world markets for waste materials of take-back requirements for product packaging, as pioneered by the German packaging laws. The novelty of trade agreements, combined with the novelty of EPR, causes uncertainty which should be acknowledged as a factor affecting programme design.[26] While the magnitude of these types of trade issues has so far been small, they may well become larger in future as the product and geographic coverage of EPR policies and programmes grow.

Three main areas of potential friction have so far been identified. These are discrimination between domestic and foreign products; technical barriers to trade; and dumping of recyclable waste on world markets. The relevant aspects of international trade law appear to be GATT (General Agreement on

Trade and Tariffs) 1994, the WTO (World Trade Organisation) Technical Barriers to Trade Agreement (TBT) and the WTO Agreement on Subsidies and Countervailing Measures.

On the first issue, the principle of non-discrimination is the cornerstone of international trade law. EPR policies and programmes such as deposit/refund systems, packaging and product take-back systems and recycling requirements are highly unlikely to be prima facie discriminatory. They are not likely to set out different requirements for domestic and imported products or packaging explicitly. The problem arises however with the more complex question of implicit discrimination. Implicit discrimination can occur because EPR schemes will naturally be influenced by national preferences for particular types of materials, the availability of indigenous natural resources, and the actual or potential constraints on waste disposal options. Imports may make use of packaging materials which are more abundant in the originating country, but may not be recyclable in the importing country if there are insufficient economies of scale. Imports may require more or heavier packaging. Importers will be at a commercial disadvantage in take-back systems because of greater transport costs, and perhaps less well developed relationships with recycling intermediaries in the domestic market.

These types of trade effects can on the one hand be considered as the usual effects of product-related requirements. In some circumstances domestic suppliers enjoy competitive advantages, and this is simply a commercial reality. On the other hand, international disciplines exist to constrain the degree of Government-induced implicit discrimination that is internationally acceptable. In terms of the obligations of GATT 1994, it is not possible to provide a definitive interpretation of how the relevant Articles would be applied in the context of EPR schemes. Nevertheless, the basic approach is that Government measures should not treat domestic products more favourably than the like imported product, and measures should not be applied in a manner that constitutes arbitrary or unjustifiable discrimination or a disguised restriction on trade.

These issues are closely related to the second area identified above, namely standards and technical barriers to trade. Certain EPR programs may act as non-tariff or technical barriers to trade because they pose difficulties for market entry for imported products. Recovery, re-use and recycling requirements can pose special problems for exporters who may face difficulties arranging for collection, recycling, return or disposal of packaging or products. In the absence of mechanisms to inform affected parties world-wide, inadequate access to information on market requirements can impede trade. Developing country exporters and small exporters would be particularly susceptible to these problems.

If particular EPR programmes are implemented in the form of “technical regulations”, then the WTO Agreement on Technical Barriers to Trade would apply. Under the TBT Agreement, technical regulations may not be “prepared, applied or adopted with a view to or with the effect of creating unnecessary obstacles to international trade”. Regulations should not be “more trade restrictive than necessary to fulfil a legitimate objective, taking into account the risks non-fulfilment would create”. Governments are also required to notify the WTO of new technical regulations, and provide an opportunity for written comment. So far no dispute settlement cases have involved the application of the TBT Agreement to EPR policies or programmes.

The third area mentioned concerns the international price effects of collecting large volumes of recyclable wastes. Particularly in an environment of underdeveloped recycling activity, new schemes that dramatically increase collection rates can yield large quantities of wastes that may exceed the domestic recycling capacity. Such material may then be sold at very low or even negative prices on international markets, if disposal options are unavailable or uneconomic. In the past, this phenomenon has undermined recycling activities in some countries because of low market prices for the materials. WTO rules on private sector predatory pricing and on government subsidies could be relevant in these circumstances. It

would seem however that as international markets for waste materials becomes deeper, this issue would be less of a concern than in the past.

In summary, it would seem that EPR policies and programmes do not give rise to immediate, obvious or large-scale trade problems. Vigilance will be required however to ensure that EPR policies do not create unnecessary obstacles to trade or arbitrary or unjustifiable discrimination that affords protection to domestic industry. Respecting international requirements for notification and transparency of new requirements and schemes, and perhaps making allowances for particular problems caused to developing country exporters, would go a long way to avoiding any international friction.

8.4.2 Other concerns

National EPR programmes would be usefully protected from cross-border free riders not inclined to respect any EPR programme. But customs declarations and other forms of official and strict border control have high transaction costs and are to be minimised in a common-market, free-trade world. Domestic PROs and their members will have every incentive to become the eyes and ears of their government. Private-sector, PRO-lead vigilance may well be needed to identify incoming imports as *(1)* as not being subject to domestic EPR requirements, *(2)* as meeting domestic EPR requirements, or *(3)* as coming from free riders.

Scrutiny may be directed to expose products bearing the Green Dot from foreign countries of manufacture with no Green Dot programme, imported without payment of the Green Dot fees of the nation where the products are consumed and must be managed as waste. Attention may be directed to identify products bearing the Green Dot of their foreign nation of manufacture (perhaps a nation with low Green Dot fees) that are imported without payment of any extra amount of the high Green Dot fees of the programme of the importing nation. Depending on the circumstances, a foreign producer exporting packaging that is difficult or expensive to manage as waste may be regarded as a sort of free rider that cannot be accommodated routinely by the importing, EPR nation. If isolated introduction of EPR in a single country results in substantial cross-border buying and EPR evasion by consumers, such consumer purchasing may have to be monitored. Widespread and commercial buying to evade EPR costs may require a response.

When faced with such behaviour that threatens or undermines a nation's EPR programme, government authorities could take the official action against importers subject to domestic jurisdiction that the PRO cannot take against non-members. At the same time, some losses in EPR revenues must be tolerated as inevitable and balanced with the administrative costs of enforcement. Finally, governments could act to address certain dangerous "uncommon" packagings, such as those containing heavy metals over allowed concentrations, as the EU now is in the process of doing.[27]

8.5 Rewarding responsibility

The EPR environmental authority should be ever mindful that a key to successful implementation of EPR is active producer participation in product redesign, i.e. design for environment (DfE). Their profits should be expected to continue and not to suffer a competitive disadvantage, because the privatisation of waste management will be borne by all competitors in their product sector. Whether EPR succeeds or fails will depend significantly upon whether producers see EPR as an opportunity to increase their own individual profits. These profits may come from the savings of materials minimisation, from the value of the resources recovered attributable to their products, and from the avoided cost of

conventional disposal of waste. The alternative is that the most responsible producers will receive no such additional profits and will see participation in a PRO just as a problem.

EPR programmes to date seem not to have identified and passed back to their most responsible producers the full benefits of the redesign of their individual products, but to have allowed waste managers or perhaps the collective organisation (PRO) to keep many benefits as revenues. When any profits have been received by PROs and passed back to the membership, they have been distributed among all PRO member producers without identifying and crediting the particular producers whose actions created the benefits.[28] A PRO should endeavour to obtain from waste managers and to allocate, fully and fairly, the economic benefits from the waste minimisation activities of the most responsible producers who undertake to redesign their products, and thus offset the cost of individual assessments for participation in their PROs. It was mentioned in section 1.3 that an PRO is akin to a "bubble", a concept attractive because it allows industry to determine the least-cost ways to meet overall performance goals without official micro-management of every internal source. Where there are many individual companies within a "bubble", the bubble itself can fail to encourage or reward them individually.

For products of significant unit value, one way to reward the benefits deriving from the most responsible producers who undertake product redesign, could be through the use of a bar code, "green port" or other electronic scanning system placed on products at the time of manufacture. Upon collection at the post-consumer stage, such an identification system would allow each particular product's producer and constituent recoverable materials to be distinguished, facilitating the assignment of value back to the appropriate producer.[29] With such a producer identification scheme, the producers who do redesign products would share most in the economic value of the efficiencies that EPR creates. Accurately rewarding such participation will make possible the environmental results that society wants. If PROs do not develop the additional measures needed to fully encourage and directly reward the most responsible producers, the EPR governmental authority may need to act to provide appropriate legal authority.

8.6 Additional factors supporting success

Where producers establish PROs, the EPR environmental authority could upon appropriate application approve each PRO, and exempt its members from individual take-back requirements. In addition to any other remedies or punishments authorised for PRO failures, the EPR environmental authority may have the authority to revoke, if necessary, a PRO's qualification, which would, in turn, revoke the exemption of each of its members from the individual responsibilities of a final producer. Both for the PRO and for individual producers, the consequences for failure to meet performance goals should be clearly more expensive than the internalised cost of financial responsibility for assuring waste management. However, the EPR environmental authority cannot expect the PRO to do the impossible, to enforce against its non-members, and the EPR environmental authority should have specific powers to do so in support of the PRO.

In co-operation with the responsible actors, governments should define measures of success for an EPR programme. Performance rates may be set on the industry sector as a whole according to particular geographic areas. Under the German packaging law of 1991, performance rates are set by "catchment area", a term not defined in that law. It seems that "catchment area" is a collective term that usually encompasses the sub-national territory of a group of manufacturers and distributors, whose individual ability to be exempt from the individual take-back requirement depends on the collective performance of the PRO for all its members.

The EPR environmental authority may also itself engage in public education efforts to increase consumer participation. As much as possible, this should be done in concert with the PRO and its members as they employ "EPR certificates" or "EPR labelling" such as the "Green Dot", and the tools of modern advertising to build consumer preference for their EPR-friendly products, as well as consumer participation in product take back or separation.

Mandatory public education efforts and also product labelling may become necessary, as is happening under the EU Directive for Packaging and Packaging Waste.[30] Within five years, for all packaging produced within or imported to the EU, the Directive requires an EPR marking or symbol on all re-usable or recyclable packaging, a material identification marking scheme to facilitate sorting, and a governmental public information campaign on the foregoing. When developed and implemented fully, these requirements will ban noncomplying packaging from the EU and will achieve at least within the EU an international harmonisation of EPR labelling schemes. The relationship of the EU ecolabel to the pre-existing and successful multi-national use of the private-sector Green Dot label no doubt will be taken into account.

To assure continuous improvement in EPR programmes, the EPR environmental authority may establish advisory oversight councils or bodies with membership from producers, PRO, local authorities, and consumers. A good example is the Dutch use of a joint (government-private-sector) committee to oversee the PRO. Such bodies with some independence will review programme requirements and performance and will make recommendations for improvement. In whatever process, there must be co-operation between the government and the private sector. For example, the German PRO and Environment Ministry have co-operated in extensive programme adjustments. Legislation to revise the 1991 law is being developed and expected soon. Amendments to the law may require that firms not joining the Green Dot programme and its PRO must finance their own measures to achieve the national recycling goals for the products they make.

No matter how success is defined, the monitoring of performance could be usefully based on requirements that key actors self-monitor, collect performance data, and report results to government authorities and the public. Member governments may look to Japan's 1995 packaging law, where such requirements are provided in useful detail and are specifically imposed upon the PRO itself. A Japanese packaging PRO is required to obtain the approval of the national ministries of its recycling methods, to submit annual plans and reports for approval, to not discriminate against applicants for membership, to not suspend or cancel any recycling work without governmental permission, to keep account books and records, and to allow governmental inspections, or it may lose the official designation that qualifies it to act as a PRO. A PRO's membership fees should be clear and appropriate, and its financing should be supported by account books and records and a preapproved annual Operating Plan and Income and Expenditure Budget. Finally, producers must keep account books to record details as required by national ministries regarding sales of packaged products, use of packaging, and recycling of items or materials as required, must submit reports upon request, and must allow governmental inspections.

The OECD's EPR work to date also makes the following observations regarding *activities that complement and support EPR programme performance*:

- Governments may wish to consider the benefits of eliminating tax incentives, financial supports, and other subsidies or preferences that favour use of virgin materials in products for which secondary materials provide an effective substitute. Government purchasing policies should maximise the cost-effective use of products containing secondary materials. National governments should use all available leverage to ensure that purchasing policies of subordinated government units, enterprises providing services to government, and other enterprises, implement similar purchasing policies. The

institutionalisation of EPR approaches represents a very promising, though not an independently sufficient, condition for achieving eco-efficient enterprises and societies.

- If national economic instruments, e.g., virgin material taxes, deposit-refund systems, advance disposal fees and even green procurement, are employed to stimulate waste minimisation activities, revenues received for programmes related to these goals could be separately maintained, and national governments could consider passing such revenues to local authorities to stimulate and reward their participation.

- Local authorities can be encouraged to establish unit-based pricing for municipal waste management based on full-cost accounting, and publish results. Unit-based pricing, known in some countries as "pay-as-you-throw" systems, are to consumers what EPR systems are to private enterprises. Consumers would pay for waste collection and disposal in direct proportion to the amount of waste they produce. This will provide an incentive to individual behavioural change that is not present in a property tax or flat fee that "hides" the true cost of waste management. This can probably only be expected to work with sufficient levels of public awareness. Ideally, as consumers will be encouraged to produce less household waste, they will seek less waste-intensive products in the market place, hence positively influencing the demand-side of the sustainability equation.

9. PERFORMANCE MEASURES AND ACHIEVEMENTS

This section provides an analysis of what has been learned so far from the achievements of existing national programmes of post-consumer product responsibility. To facilitate comparisons between different EPR systems, five core performance criteria have been developed and applied to two well-established programmes: the EPR packaging systems for Germany and the Netherlands. The advantage of the proposed criteria is that they not only facilitate more consistent performance assessment, but they can also be more broadly used as central policy considerations for the mid-stream adjustment of *existing* EPR programmes, as well as for the strategic planning of *future* EPR programmes. Without intending to be definitive or exhaustive, this report will analyse five core considerations -- environmental effectiveness, economic efficiency, technological innovation, political acceptability, and administrability.[31] Continuous overall improvement of an EPR programme can be supported through increasingly systematic monitoring based on the fulfilment of these or similar criteria on a national level.

9.1 Environmental effectiveness

This performance measure deals with the extent to which the programme has achieved established environmental objectives and/or the extent to which environmental improvements occur from year to year. Components of environmental effectiveness include changes in environmental quality, health risk reduction, and resource efficiency.

Experience under the 1991 German Packaging Ordinance provides substantial information on the effectiveness of the law in waste avoidance by eliminating unnecessary packing and in waste minimisation more generally by increasing recycling rates The figures reported from 1993 to 1995 show very substantial reductions (about 66 per cent by weight of packaging waste, and about 10-20 per cent by volume of all waste) going to landfills and ordinary incineration. There has been a noteworthy elimination of unnecessary packaging, a shift away from plastic and composite materials to paper and other substitutes, and an increased use of refillables Recycling targets were met in all categories from the start. The key recycling results achieved were *(a)* 72 per cent of total glass, tin-plate and aluminium, and

(b) 64 per cent of total plastic, composite and paper products. However, collections were so great that surplus material (especially plastics) has been exported for recycling, causing some international frictions.

It is clear that many German companies acted to prevent waste, and that the PRO was highly effective both to encourage this and to directly increase recycling. The license fees charged to producers (allowing them to apply the Green Dot symbol to packaging) provides funding to operate the PRO. The fees are designed to encourage waste prevention and the shift to more readily recyclable materials, some desired environmental effects that have been documented. EPR has also been reinforced by the rapidly increasing cost of landfilling, perhaps caused in part by the reduction in volumes of waste going to landfills, that are expected to cease to be an available option in a few years. Noteworthy is that packaging wastes not prevented were managed entirely by the private-sector financed and operated collection system and by recycling businesses. The achievement of meeting recycling targets with full private-sector responsibility is believed to have ended the need for many new landfills and improved environmental quality in general, although there are no precise measurements available of improvements in environmental quality.

With regard to resource efficiency, as expected reduction in the use of packaging material was offset to some degree by the extra costs of re-use (for transport and washing) and for processing recyclables, especially heavy glass as a substituted material. Technologically innovative plastics recycling is experiencing start-up costs and receiving subsidy; while costs should fall, not all recycling technologies are expected to achieve competitive costs.

Another, rather different effect of the German programme is that it stimulated neighbouring and even distant countries, and eventually the EU also, to develop EPR programmes. This has spread very widely the environmental effect of EPR and the other effects discussed below.

The 1991 Dutch Packaging Covenant experience also provides substantial information on improvements in environmental quality, as measured by waste prevention and management and some observations on resource efficiency. The figures from 1991 to 1994 show that all covenant targets were reached by 1994 except for plastics. There have been substantial reductions in the amounts of generated packaging waste (around 10 per cent by weight overall) in almost all material categories[32], with plastics remaining a problematic material in the Netherlands as elsewhere. Product and material re-use targets were also met in all but one category, with plastics falling only 6 per cent short. The key recycling results achieved were *(a)* 80 per cent of non-refillable glass, *(b)* 60 per cent of dry papers and cardboard packaging, *(c)* 44 per cent (6 per cent less than goal of 50 per cent) of bottles and containers of high-quality plastics, and *(d)* 75 per cent of metal composites.

It is clear that many Dutch companies acted to prevent waste, by materials reduction, shifting to re-usables, and making technological innovations. EPR has also been reinforced with a landfill ban. Packaging waste generated since 1995 cannot be landfilled but can only be re-used, recycled, or incinerated with energy recovery. Among other effects, this has mobilised participants including municipalities to facilitate proper sorting of wastes by consumers. Noteworthy is that wastes not prevented were managed mostly within the existing municipal collection system and recycling businesses. The combination of EPR's quantified materials reductions, re-use/recycling targets, and the landfill ban, are believed to have improved environmental quality in general although there are no precise measurements available of improvements in environmental quality.

With regard to resource efficiency in the Netherlands, reduction in the use of packaging material was offset, to some degree, by the extra costs of re-use (for transport and washing) and also for processing recyclables.

9.2 Economic efficiency

The second performance measure is the extent to which the programme has operated with minimum cost to society. Components of economic efficiency may include various domestic impacts (prices, employment, profitability and competitiveness, growth), as well as trade and international competitiveness. Below is some economic data for the German and Dutch packaging EPR programmes.

Experience under the 1991 German Packaging Ordinance provides substantial information on its economic effects. The per capita cost is about $24-$30 US per year, a level that is not readily discernible in product pricing. The average total cost for processing a ton of waste material by the German PRO is about $412 US, a figure that some perceive as high but that equals the expected cost of landfilling by the year 2,000. The PRO estimates that of the total cost, about 80 per cent goes to collection, transport, and sorting, 15 per cent to plastics recycling subsidies, and the rest to personnel and overhead. The revenues to pay for this are generated entirely by fees charged producers to license their use of the Green Dot symbol. No information was reported to indicate that the fees impacted the competitiveness of industry. Employment effects are regarded as positive; while some skilled-labour jobs have been lost, 20,000 unskilled jobs have been created in the sorting sector.

The 1991 Dutch Packaging Covenant experience also provides some information on its economic effects. While little market data is available, some circumstantial economic evidence is. Dutch GDP grew from 1991-1996 while the packaging waste stream was reduced. Interviews with most of the actors participating in the Packaging Covenant show their generally favourable impression with the process and the results. Some corporations found the covenant's required planning tools -- life-cycle and market-economic analyses -- helpful to better controlling their packaging costs and a greater appreciation of the benefits of doing so. Many companies stated that the covenant did not change their economic situation, probably because packaging is such a small part of the total cost of the product. Also, the Dutch PRO merely organises its membership without making assessments to finance or operate waste management. To date in the Dutch packaging experience, impact on the competitiveness of industry is not a perceived problem.

Under Phase 3 of the EPR project, efforts will be undertaken to develop more systematic approaches to assist with the evaluation of EPR economics.

9.3 Innovative advancement

The third programme performance measure deals with the extent to which the programme has stimulated technological and managerial innovation. This "dynamic efficiency" is essential to increasing economic efficiency and environmental effectiveness.

Experiences under the 1991 German Packaging Ordinance provides substantial information on the technology innovations To increase the availability of recyclable materials, new sorting technologies have been developed. These involve automation to separate materials using hydrocyclones and centrifuges. To increase the use of separated materials in recycling processes, there have been marked refinements in existing technologies for glass and paper, and new technologies developed for plastics for use as feedstock for materials other than plastic products. These new technologies use waste plastics in industrial processes involving pyrolysis, hydrogenation, synthesis gas, and steel production. Pre-existing investment in incinerators and landfills now is under-utilised as these are facing technological obsolescence. Furthermore, the expected changes and innovations in packaging itself have occurred, many being comparable to those under the Dutch experience described next.

The 1991 Dutch Packaging Covenant generated hundreds of technologically innovative adaptations in forms of packaging. All new packagings were lighter, smaller, used less composites, or consisted of hybrids (typically a returnable or re-usable hard-cover container and an internal sachet to be recycled).

The Covenant explicitly requires that producers undertake Life-Cycle Analysis (LCAs) and Market-Economic Analysis (MEAs), and it is in this context that one can better understand perhaps the most important innovative advancement in the Dutch context. The process of undertaking LCAs/MEAs inherently forces increased co-operation between all links in a product chain, and results in improved insights into enterprises' cost structures. Corporate awareness of product system environmental attributes is enhanced. Fairer solutions for all enterprises involved in a product chain can be promoted, and the achievement of best practicable "cradle-to-grave" solutions for attaining EPR performance requirement are facilitated. Overall, the Covenant's required LCAs/MEAs have emerged as key tools for achieving innovative advancement, waste prevention and better control of costs.

9.4 Political acceptability

The fourth programme performance measure is the extent to which the programme has enjoyed political acceptability. Components of this consideration may include public participation, transparency, social equity and conformity with international agreements.

The 1991 German Packaging Ordinance and the 1991 Dutch Packaging Covenant both are believed to have enjoyed a high degree of domestic political acceptability. It seems that the political acceptability of EPR corresponds closely to the level general environmental awareness. It will also depend on the realisation that "business-as-usual -- especially the provision of certain government subsidies - is unable to minimise waste further, and that only the establishment of appropriate macro-level conditions coupled with private sector and citizen action can alter the present, unsustainable ways. At the household level, the political acceptability of EPR can translate into increasingly sustainable behaviour patterns, particularly in view of the fact that the consumer must be enlisted to help producers achieve EPR objectives. More generally, politically acceptable and well-designed EPR programmes will tend to forge formerly non-existing links between national production patterns and national consumption patterns.

Popular enthusiasm for the EPR alternative, if activated into consumer participation in collection systems designed to maximise consumer "drop off" and other forms of citizen co-operation, can significantly reduce any inefficiencies of EPR. As increasing levels of lower-cost collection and re-use/recycling/recovery are achieved, per-unit processing costs should decrease and economies of scale should be realised.

Political acceptability is mainly a derived function, caused by the public's desires for new environmental, economic, and social realities. Increased popular support also will be an effect of the perception that a programme will succeed or is succeeding to achieve desired effects. Moreover, the German and Dutch studies show clearly that producer, consumer, and citizen enthusiasm will be important to cause the pervasive, active involvement that is needed for EPR programme efficiency and effectiveness. So it appears that the level of popular support for EPR will be both cause and effect, and that the level of political acceptability is one of the most important policy considerations that supports programme performance. Empirically, it seems that EPR's level of political acceptability varies widely among countries.

This leads to a key policy consideration. Programme designers will be well advised to place great importance on public information, public participation, and transparency in EPR programme design, operations, and oversight. While to some extent this would be done as a matter of standard procedure, the success of EPR would seem to particularly dependent on it.

9.5 Administrability

The fifth performance measure is the extent to which the programme has been feasible to carry out. Components of administrability may include smooth integration with policies for other sectors, simplicity and flexibility of operation, effectiveness/compliance, and costs associated with monitoring, licensing, enforcement. Cost impacts and attributes of effectiveness should be considered both for governmental and private-sector entities.

Experience under the 1991 German Packaging Ordinance provides substantial information on the administrability of the law, and these lessons learned are central to much of this report. Substantial start-up problems were encountered in the ambitious German approach, and they have been addressed with continuous programme refinements by both governments and industry. A revised packaging ordinance is being developed. In addition to new legal requirements, no doubt there will be more refinements implemented by new governmental policy, new PRO policy, and by improvements in PRO contracting. The issues of administrability that were encountered are numerous, but they are not so serious as to threaten the success of post-consumer product responsibility. Previous discussions in this report discussed the progress that Germany has made to improve administrability for its packaging programme and to build the foundation to eventually achieve its national vision of multi-sector EPR.

The 1991 Dutch Packaging Covenant experience also provides some crucial observations on programme administrability. Some favourable elements include involving key actors in all phases, and requiring business to use self-analysis planning tools such as LCAs/MEAs. These elements have achieved a broad although not complete support for the EPR programme that surely has made its implementation go more smoothly. On the other hand, some have complained of lack of transparency and of excessive reliance on incineration. There may be unrealised opportunities to better integrate the environmental authority's use of the EPR with production-based policy instruments such as environmental permitting for pollution control. This integration may become more necessary if EPR programmes that successfully reduce municipal waste cause changes elsewhere in the product life cycle, such as increasing industrial waste and energy use in the manufacturing process.

Two important challenges became evident with the implementation of the 1991 Dutch Covenant. First was that producers are free to participate or not, and those who do not participate may operate as before as "free riders" outside the new EPR system. A second disadvantage was that even for those participating producers, initially the covenants did not indicate whether the required performance results were only suggestions or were requirements legally binding and enforceable according to civil law. In 1992, the Dutch Scientific Council for Government stated that for a covenant to be non-binding it must clearly say so, otherwise it shall be binding.[33] This OECD report does not attempt to draw any conclusion as to whether Dutch Packaging Covenant today is or is not legally binding and enforceable, but simply notes that there has been at least widespread uncertainty, a situation that future programmes may want to avoid.[34] Not all Member countries may enjoy the level of shared social values and cohesion found in the "Dutch consultation culture" that has allowed the Dutch Packaging Covenant to achieve success comparable to what is expected of a mandatory programme. A new Dutch Packaging Covenant is under development that will include all stakeholders and facilitate more efficient enforcement.

10. OECD FINDINGS

There is a strong acknowledgement across mostly all OECD countries that an alternative tool, *EPR*, is now at hand with which to further leverage precautionary approaches, potentially achieve great improvements in the minimisation of waste, and change the way that industries think about their product systems. EPR is a multi-objective tool that when properly undertaken would seem to offer several opportunities for innovative advancement in public sector and corporate environmental governance.

With increasing international collaboration on EPR, the chances for *avoiding potential problems* and *institutionalising* this inventive approach are considerably enhanced. Ecological and economic benefits are expected when a range of EPR design and implementation factors are taken into account during the programme design and implementation phases.

Phase 2 of the OECD EPR Project reaches the following conclusions for further consideration and development during the Phase 3 workshops.

(i) General

EPR programme efficiency heavily relies on producer and consumer support and involvement in its operations. Therefore, more important than ever is clarity and cohesiveness in programme design, operation, and oversight, as well as the promotional leadership of government.

(ii) Responsibility Assignment

The fundamental legal conceptualisation of "ownership" of post-consumer product responsibility could be revised to clearly assign "ultimate responsibility" to producers. As a means toward the privatisation of waste management (i.e., internalisation of associated environmental costs) and better overall waste minimisation, EPR requires that producers will *retain or regain* effective ownership of their products once the post-consumption stage is reached.

Without diluting producers' ultimate responsibility, extended responsibility should be shared. However, the notion of "shared responsibility" is useful only if individual roles and responsibilities of different actors (including national governmental authorities, final product manufacturers and importers, corporate Producer Responsibility Organisations, consumers, and local government authorities) are made unambiguous, and mutually exclusive, to the extent possible.

It will also be important to identify the scope of the final producer's responsibility for end-of-life "similar" products that come into his possession, but which he did not actually produce. This would include consideration of responsibility for end-of-life "orphan" products where the original producer no longer exists. This may be particularly relevant to long-life, complex and high-cost products.

Certain long-life products will have been manufactured before the relevant EPR programme came into effect, and the issue of who should pay for the recycling of those products will likely require further analysis to arrive at efficient solutions.

(iii) A Level Playing Field

In order to establish a far-reaching, widely effective EPR programme with an equitable distribution of benefits and costs, it seems likely that government action will be needed on some level, whether it be the establishment of framework legal provisions for EPR, or in the negotiation of an EPR "voluntary agreement" with a target industry sector.

Free-riding of all sorts should be prevented and if necessary disciplined by governments and/or corporate Producer Responsibility Organisations (PROs) that have been appropriately empowered to undertake such activities. Under most circumstances, the private sector will take measures to achieve officially established performance requirements only when individual enterprises are faced with economic handicaps or specific sanctions for failure to do so. Importantly, the consequences for failure should be more expensive than the internalised cost of financial responsibility for participating in EPR.

(iv) Phased and Flexible Approaches

Governments may wish to consider the benefits of phasing-in EPR programmes, beginning with measures to promote markets for secondary materials and stimulate development of recycling capacity, followed by the establishment of monitorable performance targets.

It is more effective to allow the private sector to devise the practical means for achieving these targets than to create detailed government regulations.

(v) Performance Requirements

EPR performance requirements should be progressive, and manageable. Waste prevention, product re-use and recycling targets would probably be best set through an entire sector range, and not only on a sub-sector basis, in order to have a far-reaching impact, while treating competitors equally.

(vi) Promoting Application of Forward-looking Business Tools

Participation in an effective EPR programme will tend to cause private enterprises to re-think and reduce their products' environmental impacts. EPR can be an important accelerator to foster continuous overall improvement in corporate environmental management. Creative methods to more explicitly link EPR-based performance objectives with broader cleaner production objectives could be advantageously explored. In this context, an investigation of the feasibility of employing other tools, such as corporate Environmental Management Systems, might be useful.

Encouraging or, as some countries have done, requiring, business self-analysis planning, i.e., life-cycle and market-economic, can foster the integration of activities within and across enterprises. This can result in the more efficient attainment of performance targets, and the advancement of technological and managerial innovation.

(vii) New, Important "Corporate Institutions"

Producer Responsibility Organisations (PROs) can be a key to EPR success. Governments may usefully consider establishing all necessary favourable conditions under which PROs may be

launched to act collectively toward the fulfilment of member producers' individual responsibilities. Governments could actively support PROs by regulating non-participant free riders such that they will see the advantages of PRO membership. PROs could be encouraged to establish producer membership fees that are designed as private-sector economic instruments for promoting and rewarding waste minimisation.

(viii) International and Domestic Competition

Preliminary OECD research seems to indicate that EPR policies and programmes do not give rise to immediate, obvious or large-scale trade problems. Vigilance will be required however to ensure that EPR policies do not create unnecessary obstacles to trade or arbitrary or unjustifiable discrimination that affords protection to domestic industry. Respecting international requirements for notification and transparency of new requirements and schemes, and perhaps making allowances for particular problems caused to developing country exporters, would go a long way to avoiding any international friction.

A number of economic and legal issues of market or business concentration may be related to the activities of Producer Responsibility Organisations. National governments may find themselves challenged by EPR to reconcile and integrate their national environmental and competition policies to avoid the negative impacts associated with potential monopolies.

The special difficulties that EPR may pose for small and medium sized enterprises (SMEs) would seem to require the particular attention of governments.

(ix) Accounting and Accountability

National governments can encourage and assist local authorities to address possible "double charging", such that municipal waste management taxes or fees are reduced by the amount of the private-sector financial contribution to the (formerly fully subsidised) waste management system.

EPR programmes can incorporate full-cost accounting for financial transactions and make results accessible and easily understood by the general public. Oversight bodies composed of local authorities and representatives of major stakeholder groups could monitor the overall performance of EPR programmes and make recommendations for policy or programme adjustments.

ANNEX A: CATALOGUE OF EPR TERMS

This Annex describes: *(1)* actors in a system of extended and shared producer responsibility, *(2)* covered products and wastes, and *(3)* covered activities between actors.

I. ACTORS IN A SYSTEM OF EXTENDED AND SHARED PRODUCER RESPONSIBILITY (see section 3.3 in text for further discussion).

Descriptions are offered for the usual actors within the parameters of a generic EPR programme. The actors are presented in the order of their participation in the life cycle of a product:

1. **Final producer** means the manufacturer/producer or importer of a new or recycled product placed into commerce by direct consumer sale or placed into the distribution chain to consumers. Where packaging is a product or waste covered by EPR, a final producer is the filler of the packaging, or an importer, of a packaged product. Final producer is not an upstream supplier or recycler of ingredient or intermediate materials, parts, or potentially re-usable or recyclable parts or products that have not yet been fully prepared for consumer sale.

Final producer may be defined to include the distribution chain ending in retailers. While most producers are in the private sector, it should be noted that a producer may also be a public entity. Examples include publicly owned manufacturers and retail stores or post exchanges on military bases. Final producer should be defined to prevent a final producer from avoiding ultimate EPR responsibility by engaging another person to act in his place, such as a contractor, agent, or broker.

2. **New product final producer** means any final producer of new products. While most products are new and produced by new product final producers, a definition of "new product final producer" is necessary to differentiate the increasing number of final producers of recycled products that are not new but are also sold to consumers or put into the distribution chain to consumers.

3. **Recycled product final producer** means any final producer not of new products but of remanufactured (recycled/recovered), refurbished, reconditioned, upgraded, or re-usable products that are placed into commerce by direct consumer sale or placed into the distribution chain to consumers. The term does not include suppliers or recyclers of ingredient or intermediate materials, parts, or potentially re-usable or recyclable parts or products, that have not yet been fully prepared for consumer sale. Recycled product final producers either repair or enhance products, disassemble them for parts, or totally recycle or recover products, and then sell them on secondary consumer markets as final products.

This definition has not been necessary in the packaging experience to date, but it will be necessary with longer-life and complex products. This definition is a prerequisite to the imposition of the ultimate EPR obligations of a final producer on recycled product final manufacturers and importers, and to the corresponding exclusion thereafter of the responsibility of the original new product manufacturers and importers from responsibility for these recycled products. Alternatively, it may be decided expressly to continue EPR obligations on new product manufacturers if EPR obligations are not shifted to and

imposed upon recycled product manufacturers, but this approach has not been used here. This definition is also needed to separate up-stream recyclers and suppliers from the ultimate EPR responsibility of a final producer.

4. **Distribution chain** means all actors in that portion of the entire life-cycle chain for products between the final producer and the consumer. These businesses are vendors and lessors, including distributors, wholesalers, and retailers of final products to the new and secondary markets. The last actor in this chain will be called the retailer.

A definition of the distribution chain and its members is a prerequisite to the imposition of any EPR obligations at the key retailer-consumer point of sale or lease, where consumer responsibility begins. Depending on the national law, distributors and wholesalers up the chain from the retailer may not have ultimate EPR responsibility. They may be merely conduits back to the manufacturer or PRO of post-consumer responsibility for goods and the protective handling of any EPR payments by consumers. These responsibilities would be applied by contracts. Alternatively, the distribution chain may bear ultimate responsibility by law, as under the German packaging ordinance that placed ultimate EPR responsibility, not just on final producers, but also on a much larger group including retailers.

5. **Consumer** includes persons receiving by purchase or lease new or recycled final products, initially at the point of consumer sale. Consumer includes a person who receives a product, including a used product bought from its previous consumer for continued use, during and before the end of the product's useful life, and not for purpose of refurbishing, reconditioning, upgrading, or to make a new final product.

It will most likely be appropriate to define consumer to include all actors whose acts of consumption can have an impact upon municipal waste levels. This would include households, business offices, retailers, and institutions such as schools and hospitals. A definition of consumer is the prerequisite to the sharing of EPR obligations by the consuming public, including the obligations first to help to pay for EPR and then at the end of product's consumer life to act responsibly as to the product's fate. EPR responsibilities for consumers, while shared with final producers, should be separate and non-overlapping.

6. **Collector** includes final producers and possibly others, e.g. retailers, with take-back responsibility, PROs, and recyclers of end of life products. Where a local authority receives a financial contribution from a PRO, collector includes the local authority and if appropriate may include the local authority's contractors for waste management.

7. **Producer Responsibility Organisation (PRO)** means the collective entity created and governed by producers to manage collectively their individual responsibilities in relationship to EPR performance objectives. This may include activities at the point of consumer sale, as well as those following end-of-product-life such as product take back.

Depending on programme design, a PRO's responsibility may include paying all or a portion of the cost of final disposal as waste of any unretrieved products and recycling residues. Where the PRO has full financial responsibility, if appropriate the term may encompass the PRO's contractors for waste management, which may include the local authority. PRO may also refer to a foundation or association that is effectively supporting and organising industry to meet social goals, though its members may not be subject to legally binding or ultimate responsibility and it may not necessarily be involved with overseeing or financing waste management. Other names applied to PROs in different countries have included industry exemption schemes, third-party organisations, designated bodies, or the like.

8. **EPR environmental authority** means the governmental environmental agency at the national or sub-national level of government that is authorised broadly to implement the EPR programme. While it is possible that the EPR environmental authority may be at the same level as a local authority, the EPR environmental authority is likely to be at a higher level of government with broad environmental authority to implement EPR in co-operation with the many local authorities within its jurisdiction.

9. **Local authority** means the municipal or other local government or other public-sector authority exercising responsibility with regard to collection and other aspects of waste management. It may act either in the absence of a PRO, as a contractor for a PRO that has full financial responsibility, or as the recipient of a financial contribution from a PRO. If appropriate, the term may include the authority's contractors that are waste managers.

10. **Waste manager** includes the end-of-life product collector, transporter, waste processor, landfiller, incinerator, person engaged in other forms of final waste disposal, and a person who causes diversion from the waste stream to a recycler. A waste manager may also engage in collection as a collector and recycling as a recycler.

11. **Recovery operator** means a person engaged in recovering energy from waste. It excludes landfilling and ordinary incineration.

12. **Recycler** means the processor of post-consumer products who collects, separates, transports, or processes potentially re-usable products, parts, or materials for the purpose of facilitating their re-use by final producers. A recycler includes a person engaged in product and/or materials re-use to make the same, related, and unrelated products from secondary, recycled materials, but excludes recovery operator (defined above).[35] A recycler includes a supplier to recycled product final producers and new product final producers. The term also includes actors even further upstream, e.g. supplier to suppliers of ingredient or intermediate materials, parts, or potentially re-usable parts or products that have not yet been fully prepared for consumer sale. A recycler is not the producer of recycled final products for consumers.[36]

13. **Recycling chain** encompasses all the actors in the life cycle chain following the end of the product's consumer life up to but not including the final producer of new or recycled products. Depending on the specific nature of the EPR programme, the recycling chain will include some or all of the following actors: the PRO, the waste manager, the local authority, the recycler, and the supplier.

14. **Supplier** means the seller of products, parts, and materials to a final producer, or to any intermediary suppliers thereof. A supplier provides ingredients or intermediate materials, parts, or potentially re-usable or recyclable parts or products that have not yet been fully prepared for consumer sale. A recycler is also a supplier if he sells directly to the final producer.

A definition of supplier is a prerequisite to the exclusion of up-stream recyclers and suppliers to final product manufacturers from the ultimate EPR responsibilities that are appropriate only for final producers. Only final producers should bear ultimate post-consumer EPR responsibility, because only they are able to redesign products and order waste-preventing ingredients from suppliers. However, the same producer may for some products or product applications be a final producer with ultimate EPR responsibility, but for other products or the same product in different applications the same enterprise may only be a supplier to a final producer.

II. COVERED PRODUCTS AND WASTES

EPR strategies can be applied to any number of products or parts of the waste stream. Below are definitions for covered products and wastes, offered as a checklist and framework for programme designers when undertaking to fully delineate covered products and wastes.

1. **Final product** means a new or recycled item that is produced or imported and placed into commerce by direct consumer sale or placed into the distribution chain to consumers, and that is covered by the provisions of an EPR programme. It does not include ingredient, secondary, or intermediate materials, parts, or potentially re-usable or recyclable parts or products that have not yet been fully prepared for consumer sale.

A definition of final product is needed to differentiate intermediate products for which there is no take-back or ultimate responsibility from products that requires take-back from consumers. When defining covered final products, programme designers should also consider that *(1)* a complex, long-life product such as an automobile may be viewed as an aggregation of other products such as tires, batteries, radios, etc., each of which has its own subsidiary distribution and recycling chains, *(2)* a product contained within packaging, and the packaging itself, must be separately managed in different chains, and *(3)* like different products, different material forms of packaging must at some point be managed separately in different chains.

To attach effective responsibility, each product and its final producer must be individually specified and linked in legal requirements. For example, an automobile at the end of its consumer life should be regarded as just one product if the auto manufacturer is identified as the final producer with EPR responsibility. Also, whether packaging is a product separate from the product contained within the package will depend on whether EPR responsibility is placed on: *(a)* the packaging manufacturer separately from *(b)* the contained product manufacturer or *(c)* the filler who applies that packaging to the contained product. Real-world complexities will likely challenge governments to define each product or grouping of products and to define each final producer to be subject to EPR requirements. However, this would seem necessary in order to minimise confusion and opportunities for free riding.

2. **New final product** means a product produced by a new product final producer.

3. **Recycled final product** means a product produced by a recycled product final producer.

4. **Similar product** means a new or recycled final product within the same class or category of products manufactured or imported by the producer and for which the producer has EPR responsibility even though the product was manufactured or imported by another producer.

A key problem of EPR programmes is to identify the scope of a final producer's responsibility for similar products that come into the possession of the final producer at the end of product life. This challenge is particularly linked to long-life, complex, and high-cost products. Classes or categories of similar products should be carefully described by listing name, describing useful outputs of relevant production processes, describing characteristics or functions, or by explicitly specifying exclusions and inclusions.

In the 1991 German law, similar products of other manufacturers or importers are not defined. Yet the law does provide that the take-back obligation is limited to packaging of the type, form and size of packaging supplied by the manufacturer or distributor in his own product range; this is language that may or may not be interpreted to extend the take-back requirement to similar products. Whether the

uncertainty of language was an actual problem in the German system is not explored here, where the effort is only to demonstrate to governments the need for clarity of definition.

5. **Existing product** means a product subject to EPR requirements as of their effective date. (See sections 4.2 and 8.1)

6. **Packaging** must also be defined where an EPR programme imposes requirements on packaging.[37]

7. **Waste,** to be covered by EPR, means "municipal waste" collected by or on behalf of municipalities and other local authorities. Waste also may be defined by categories of consumers with shared responsibility for what they dispose at the end of product's consumer life, including households, business offices, retailers, and institutions such as schools and hospitals. The term excludes industrial, mining, agricultural, oil-and-gas, food processing, hazardous, incinerator ash, cement-kiln dust, construction and demolition waste, and any other waste entirely managed by or at the expense of the private sector, unless these or any other wastes are managed in any way by or at the expense of a local authority, in which case they may be waste subject to EPR.

Waste to be subject to EPR also may be defined to include waste handled entirely by private waste managers (and not by a local authority) that is identical or similar to municipal waste because it comes from the same or similar sources as municipal waste. Separate from the definition of waste to be subject to EPR management is the large issue of the stringency of regulatory treatment to be accorded to valuable products that are separated, collected, and aggregated for recycling by the EPR waste management process.

III. COVERED ACTIVITIES BETWEEN ACTORS

Below, definitions are offered to describe events, acts, or transactions, collectively called "activities", that typically will have legal or other consequences in almost any EPR programme. An activity may shift in whole or in part responsibility between actors in connection with the flow of products, materials and money. The activities are not listed alphabetically, but in the usual chronological order that such activities occur in the life cycle of a product beginning with the creation of the product by its final producer.

1. **Final production** means the act of producing or importing new or recycled final products. The term does not include supplying and recycling, respectively the acts of suppliers and recyclers. To block possible attempts to use intermediaries to evade ultimate EPR responsibility, the term should include engaging a person to act as contractor, agent, or broker to perform any of the acts of a final producer. For example, the 1995 Japanese packaging law defines "manufacturing" (final production) to include (in addition to manufacturing and importing packaging) "entrusting either or both of the[se] acts... to other persons."

2. **Start of product life** means the post-manufacture placement into commerce by the transfer of a product from the inventory and possession of its final producer or importer to the start of the distribution chain to the consumer, or directly to the consumer by factory-to-consumer sale.

3. **Consumer sale** means the transfer of possession by sale from the last covered actor in the distribution chain (usually the retailer) to the first consumer of the product. Sale includes a lease that

transfers possession and substantial control of the product to a consumer. At this point, the product starts its useful life, which may take it to more than one consumer.

In a fully implemented EPR programme for long-life products, it will also be necessary to define both *consumer-to-consumer resale* **(**meaning a sale or lease transferring full ownership of the product from one consumer to another consumer for the purpose of continued use), and *consumer-to-producer sale* (meaning a repurchase, return, repossession upon consumer default, surrender of a leasehold interest, or other transaction transferring full ownership of the product from a consumer to a final producer, retailer, or other actor in the distribution chain). The former has no effect on the EPR responsibility of the final producer; the latter may transfer the EPR responsibility from the original new product final producer to the recycled product final producer.

4. **End of product's consumer life** is the point at which the last consumer of a product decides and acts with regard to a product so as to take back, separate for collection, or finally dispose of.

5. **Take back** includes the responsible act of the retailer, other actor in the distribution chain, or a final producer of receiving and accepting back a product from a consumer at the end of product's consumer life. The term may also include the responsible act of the consumer in taking and delivering a product back to one of the said actors, and in a fully implemented EPR programme for long-life products the term may include a consumer-to-producer sale.

6. **Separation** means the responsible act of the consumer, waste processor, or recycler at the end of product's consumer life of preventing the product from entering into, or of removing the product from, the aggregated waste stream.

7. **Final disposal** means the consumer's act at the end of product's consumer life of placing the product without separation in the aggregated waste stream.

8. **Collection** means the first post-consumer act of receiving from the consumer an end-of-life product that is either separated or finally disposed of. As appropriate, the term may include take back.

ANNEX B: SUMMARY OF SELECTED NATIONAL EPR PROGRAMMES

1. AUSTRIA

1.1 Legal framework

- Ordinance of 9 October 1992 covering the avoidance and recovery of packaging waste materials and specific product residues (Packaging Ordinance); (Note: The Packaging Ordinance is currently under review for amendment, therefore some of the information below is subject to change)
- Ordinance of 9 October 1992 defining targets for the avoidance and recovery of beverage packaging and other packaging waste materials.

These two ordinances should be viewed jointly. They aim to deal with the problem of packaging waste using 5 mechanisms:

1. Defining targets for avoidance and recovery
    - Re-use of beverage packaging (re-filling; recycling)
    - Residual quantities of all other packaging materials

2. Requirement on the part of the final user to return packaging.

    The final user (both consumers and tradesmen) must either re-use packaging himself or have them recovered, in a proper manner, or introduce it into the collection and recovery systems designated for such material. If no such systems exist, the final user has the right to return the packaging to the person or organisation responsible for taking it back.

3. Requirement on the part of sellers and manufacturers to take back packaging free of charge.

4. Obligation on the part of the individual to return packaging to suppliers or re-use or recycle 80% of it himself.

5. Opportunities for the manufacturers, importers and distributors to transfer the back obligation of transport and sales packaging to a third party.

Date ordinances came into force:

For packaging of beer, mineral water, soft drinks and juices there has been a previous ordinance which has come into force in 1990 fixing quotas for the re-using (refilling and recovering) of packaging. This ordinance has been replaced by the ordinance defining targets for waste packaging.

For all types of non-beverages packaging and packaging for all kinds of beverages (including milk and liquid milk products, wine, sparkling wine and spirits): 1.10.1993.

1.2 Basic procedure

Packaging Ordinance / requirement to take back packaging

****** Transport packaging:

- Possibility of doing so via a third party;
- Thermal recovery for wood (not containing wood protection substances);
- Collection quotas:

From 1 October 1993 to 30 June 1995 :	40%
From 1 July 1995 to 31 December 1996 :	50%
From 1 January 1997 to 30 June 1998 :	60%
From 1 July 1998 to 31 December 1999 :	70%
From 1 January 2000 :	80%

- Re-use or material recovery of only 80% of the packaging material taken back.
- The requirement to individually take back packaging does not apply from the time one uses the services of a third party operating a comprehensive collection and recovery system. Manufacturers and sellers must participate in this comprehensive system if they do not meet specific collection quotas themselves.

****** Secondary ("Repackaging") material:

- No collection quotas,
- No requirement to put up notices at the cash register,
- No requirement to put in receptacles for collection purposes,
- No thermal recovery permitted,
- On selling a packaged product the final consumer may leave the packaging in the place of sale or in an appropriate area near the place of sale, otherwise the packaging has to be treated like sales packaging.

*80% of the packaging taken back must be re-used or recycled***.**

****** Sales packaging:

- Possibility of thermal recovery (material and thermal recovery are of equal value),
- The requirement to individually take back packaging does not apply from the time one demonstrably uses the services of a third party operating a comprehensive collection and recovery system. Manufacturers and sellers must participate in this comprehensive system if they do not meet specific collection themselves. The comprehensive system itself has no direct collection quotas.

80% of the packaging taken back must be re-used or recovered from a material standpoint or for energy purposes.

Ordinance defining targets for waste packaging / requirement to charge a deposit

** Beverage packaging:

The following percentage of beverage containers sold on the domestic market should be achieved in 1994, in 1997 and in 2000 by re-filling and/or environmentally-sound recovery of beverage packaging, as measured by the bottling quantities sold on the domestic market (the quotas of the year 1993 have been reached for all kind of beverages):

	1993	1994	1997	2000
Mineral, table and soda water	90	92	94	96
Beer	90	91	92	94
Alcohol-free refreshments (such as soft drinks) including alcohol-free hop and malt drinks	80	80	82	83
Fruit juices, fruit juice drinks, nectars	40	45	60	80
Milk and liquid milk products	25	40	60	80
Wine	60	65	70	80
Sparkling wine and spirits	60	65	70	80

** Other packaging:

Only the following residual quantities of waste from other types of packaging may be treated in waste treatment plants, provided they are not plants intended for the material or thermal recovery of waste:

	1994	1997	2000
Glass	70 000 t	54 000 t	38 000 t
Plastics	160 000 t	103 000 t	47 000 t
Paper, carton, cardboard and corrugated board	209 000 t	168 000 t	127 000 t
Metals	55 000 t	36 000 t	17 000 t
Material composites	81 000 t	52 000 t	22 000 t

The threat of a compulsory deposit is contained in the ordinance defining targets for waste packaging, in addition to other measures which may be taken by the Federal Minister, in the case that quotas for beverage containers and other packaging described above are not achieved.

1.3 Sphere of application

Beverage packaging as well as other packaging (sales-, re- and transport packaging).

1.4 Specific goals and objectives

Under the terms of the ordinance defining targets for waste packaging, the objective is to achieve the following percentage shares through the re-filling and environmentally-sound recovery of beverage packaging, as measured by the bottling quantities sold on the domestic market at this filling volume:

	Percentage shares		
	1994	**1997**	**2000**
Mineral, table and soda water	92	94	96
Beer	91	92	94
Alcohol-free refreshments (such as soft drinks) including alcohol-free hop and malt drinks	80	82	83
Fruit juices, fruit juice drinks, nectars	45	60	80
Milk and liquid milk products	40	60	80
Wine	65	70	80
Sparkling wine and spirits	65	70	80

1.5 Collection systems

ARA

ARA (Umbrella organisation)

Manufacturers and sellers, i.e. bottlers/ packers, the industry and the trade have the opportunity of becoming part of an already existing, comprehensive disposal system which takes over responsibility for organising the collection and sorting of packaging waste materials on their behalf. By participating in such a system they are complying, by assignment, with their obligation to take back packaging in accordance with the Packaging Ordinance and the Packaging Targets Ordinance.

For this purpose the organisation "Altstoff Recycling Austria (ARA)" ["Waste Materials Recycling Austria"] was brought into being by the Austrian business community on 5 February 1993.

Legal form:

ARA was set up as a public limited company. The owner and sole shareholder is "Altstoff-recycling Austria Verein" ["Waste Materials Recycling Austria Non-profit Organisation"]. All sectors of industry affected by the Packaging Ordinance can be members of the Organisation, with the exception of waste disposal companies. The members have equal, one third representation in three so-called "curiae" (1. Bottlers; Importers; 2. The trade; 3. Packaging sector).

The management board of the Organisation at the same time comprises the supervisory board of ARA (6 representatives from 3 "curiae").

ARA covers transport-, re- and sales packaging.

For the present all the district authorities in Austria are members of ARA. ARA AG is a non-profit organisation.

Powers:

- Raising of licence fees and supervision of contribution payments;
- Formulation of general terms and conditions for the contracts granting the use of the licence symbol;
- As an umbrella organisation, ARA appoints so-called sector recycling companies (SRC's) to collect and recover used packaging materials (conclusion of waste disposal contracts);
- Supervision of the use of resources by the sector recycling companies;
- Review of the collection and recovery guarantee.

Sector recycling companies (operating companies)

- Responsibility for collection and recovery of the different types of used packaging is assumed by various sector recycling companies (SRC's);
- For glass packaging this is "Austria Glasrecycling GmbH" ["Austria Glass Recycling Co. Ltd."] (AGR), and for paper, cardboard, board and corrugated board "Altpapier-Recycling Organisationsgesellschaft" ["Waste Paper Recycling Organisation Co."] (ARO);
- "Verpackungsverwertungs GmbH ArgeV" ["ArgeV Packaging Recovery Ltd."] is responsible for the collection of material composites, synthetic materials, textiles, aluminium, tinplate, wood and ceramics;

In Austria a combination of collection and drop-off systems is in operation. Special identifying colours are agreed for the separate materials.

Powers:

- Collection and sorting of packaging waste materials;
- Appointing local waste disposal companies (= regional partners) with responsibility for implementing collection and sorting and/ or recovery programmes;
- The collection system is co-ordinated with existing local facilities;
- Calculation of licence fees;
- The sector recycling companies mentioned above share responsibility for recovery of individual material fractions with 5 further SRC's: the "Arbeitsgemeinschaft Verbundmaterial" ["Composite Material Association"] (AVM), the "Österreichischer Kunststoff Kreislauf GmbH" ["Austrian Synthetic Material Network Ltd."] (ÖKK), "Aluminium Recycling GmbH" ["Aluminium Recycling Ltd."] (ALUREC), "FERROPACK Recycling GmbH" ["FERROPACK Recycling Ltd."] and the "Verein für Holzpackmittel" ["Wood Packaging Resources Non-Profit Association"] (VHP).

The sector recycling companies operate as non-profit organisations and are "third parties" within the meaning of the Packaging Ordinance.

"Öko-Box GmbH für Getränkekartons" ["Eco-Box Ltd. for beverage cartons"]

"Öko-Box GmbH für Getränkekartons" was set up in November 1991 by the companies Tetra Pak, PKL and Elopak. The organisation operates a recovery system owned by the manufacturers themselves.

Its objective is to collect sorted and cleaned beverage cartons while achieving an 80% recycling quota for packaging returned in this way.

The "Box System" is in operation throughout Austria, whereby actual collection of everage cartons is carried out using a "box" or a "bag".

The consumer receives the "box" free-of-charge at recycling plants, post offices or freight forwarding warehouses. Such places also take back and handle boxes cost- free.

The consumer also receives the "bag" free-of-charge at his door from the "Gesellschaft für Werbemittelverteilung" ["Advertising Material Distribution Company"] (GFW).

In this case bags are either taken back free-of-charge by GFW or placed, also free- of-charge, in the ARGEV light-density material collection drum.

Following this the collected beverage cartons are recovered using a repulping technique designed to dissolve the cellulose. Aluminium and polyethylene are disposed.

1.6 Funding

ARA: Raising of licence fees from producers and importers.
Licence fees

		from July 1994
		Austr. Sch./Kg
Glass	Non-re-usable packaging	1,20
		0,20
Paper	Sales packaging	2,79
	Transport packaging	1,19
Aluminium		6,81
Tinplate	< 10l	4,58
	> 10l	3,64
Plastics	small	15,90
	large (Hollow-bodied items > 5 l., films > 1.5 m^2 or 0.15 Kg, EPS foams from 0.1 Kg)	11,91
	With hazardous contents	**17,68**
Composites (not including beverage cartons)		18,36
Wood		0,86
Ceramics		3,13
Textiles		15,90

1.7 Supervision

ARA:

- Supervision of contribution payments,
- Supervision of the use of resources by the sector recycling companies,
- Review of the collection and recovery guarantee.

1.8 Use of financial resources

Sector recycling companies:

- Collection, sorting and recovery of packaging waste materials,
- Costs of temporary storage of synthetic materials for thermal recovery until 1996,
- Public relations activity.

1.9 Industry contribution

Funding of the development of appropriate systems by the payment of licence fees.

1.10 Identifying symbol

The licence symbol is the “PUNKT” [“DOT”]. This corresponds to the German “Green dot”, but without the stroke; the “Green dot” with the German stroke is however also accepted. Imprinting is optional; there is no obligation to use an identifying symbol.

The “Dot” is the sign that the collection and recovery fee was paid for this packaging.

1.11 Qualifying factors

The threat of a compulsory deposit is clearly contained in the ordinance defining targets for waste packaging. The precise form that it will take still has to be laid down in a new ordinance.

2. BELGIUM

2.1 Federal regulations

In Belgium, packaging waste is covered by two separate regulatory systems which have been set out in parallel: the first one applies at federal level (the eco-tax) and the other one at regional level (The Interregional Co-operation Agreement).

2.1.1 Legal framework

Following approval on 16 July 1993 by the Belgian Parliament of a bill introducing an **environment tax, or eco-tax**, the Environment Tax Law was planned to enter into force on 1 January 1994.

However, due to technical and legal problems and upon request of the affected business sectors, the date for implementing the environment taxes specified in the Law was delayed and spread over 1994 and 1995 according to the different types of products. In addition, the original Law has been amended by the successive Laws of 3 June 1994, 9 February 1995, 4 April 1995 and 7 March 1996.

Eco-taxes are levied on certain products which are considered less environmentally friendly.

The "physical or legal" entities placing the products on the market, i.e. wholesalers supplying retailers, are responsible for the payment of eco-taxes. To allow appropriate control, all wholesalers must identify themselves to the Ministry of Finance (customs and excises) and receive a registration number to be applied on all packaging of product units covered by the Environment Tax Law. The law provides that this obligation may be transferred to producers and importers.

If certain conditions are met, the Environment Tax Law does however provide for the possibility of exemption from the eco-tax. A reduction of, or exemption from the eco-tax can only be granted if those liable furnish the appropriate proof that conditions for allowing this reduction or exemption are met.

When put onto the market, all products subject to the eco-tax must carry, in a readable and clear form, the registration number and the identifying symbol, as indicated in Annex 2 of the ministerial decree of 2 May 1996, concerning the fiscal regime of products subject to the eco-tax. This symbol is intended to indicate that products are either affected by the eco-tax or exempted from the eco-tax, or that a deposit is involved.

2.1.2 Sphere of Application

The Law distinguishes between different products or product groups:

- Beverage containers;
- Disposable products (razors and cameras);
- Batteries;
- Industrial packaging containing harmful substances;
- Pesticides; and
- Paper/cardboard.

2.1.3 Specific Goals, Objectives and Conditions

For the purposes of this report, information is provided only for certain packaging items within the scope of the Law (i.e., beverage containers, industrial packaging containing harmful substances, and paper/cardboard).

a) Beverage containers

An eco-tax of 15 Belgian Francs (BF) is imposed on every item of beverage packaging put onto the market, whatever the content, the capacity and the material of the packaging. ["Beverage" includes mineral water, carbonated or not, lemonade, soft drinks, beer, cider, wine, liquors, fruit and vegetable juice, milk.]

However, certain returnable beverage packaging normally subject to the eco-tax may be exempted if the following conditions are met:

1. proof is provided that the container has been refilled 7 times and that the packaging returned via the deposit system has actually been re-used;
2. the amount of the deposit must be at least BF 7 per item for packaging containing over 0.5 l and BF 3.5 per item for packaging containing 0.5 l or less; and
3. the beverage packaging is clearly labeled to show that a deposit payment has been made and that the packaging is re-usable.

If the refillable beverage packaging does not comply with the above conditions, it can nevertheless be exempted from the eco-tax for one particular year, providing that those liable for the tax furnish proof that certain re-use quotas or recycling quotas, presented below, have been attained in the course of the reference period of 12 months, expiring on the previous 30th September.

Concerning re-use those liable may be exempted from the eco-tax, provided that the following quotas are met (in terms of the total amount of drinks supplied for consumption):

1) for beverage packaging of carbonated mineral water, cola type drinks and beer:

	Re-use quotas to be reached during the reference period				
Type of beverage	1994	1995	1996	1997	1998
Carbonated mineral water	44%	48%	52%	56%	60%
Cola type drinks	44%	48%	52%	56%	60%
Beer	94%	94%	94%	95%	95%

2) For beverage packaging which contains other carbonated soft drinks:

In order to have been exempted from the eco-tax in 1994 the re-use quota during the reference period must have reached the average percentage rate of the reference re-use value of 1991.

For the following years, the re-use quota qualifying exemption should be calculated according to the following formula:

$$X = (100-Y) \times 0.075$$

"X" represents the increase (per cent) of the re-use quota in comparison with the previous period;

"Y" stands for the re-use quota (per cent) for the calculation period, which in fact is "Y+X" of the previous calculation.

Concerning recycling those liable may be exempted from the eco-tax, provided that:

1) for the years mentioned below, the material-specific recycling quotas for the indicated non-re-usable materials are achieved:

	1996	1997	1998	1999	2000
glass	55%	62%	67%	73%	80%
metals	40%	47.5%	58%	64%	80%
synthetic materials	20%	30%	43%	56%	70%
beverage cartons	20%	30%	43%	56%	70%

2) or the liable are members of a corporate recycling organisation, recognised by the regional governments and engaged to meet the above recycling quotas.

b) Industrial packaging containing harmful substances

Receptacles containing ink, adhesives, solvents or pesticides (listed in Annex 15 to the Law) and destined for a professional use are subject to an eco-tax of minimum BF 25 per unit of packaging volume with a maximum of BF 500 per item. Volumes of packaging units have been specified in the Law:

for solvents : 5 litres
for adhesives: 10 litres
for inks : 2.5 litres
for pesticides: 0.5 or 5 litres, depending on the nature and concentration of the pesticide.

The above-mentioned containers, however, can be exempted from the eco-tax, providing that the following conditions are met:

- they are collected through a deposit system, a return fee, a packaging credit ("un système de consigne, de prime de retour, de crédit d'emballage") or any other system specially designed for the product;
- the level of "the deposit, or of the return fee, or the packaging credit" must be high enough to ensure a high recycling rate of containers (minimum level for deposit: BF 12.5 per unit of packaging and minimum level of return fee: BF 5 per unit of packaging);
- fixed collection quotas are achieved within the set timeframe;
- those liable prove that the re-use, disposal or recycling of the packaging complies with the waste regulation of the respective region, and that the system is self-financed; and
- the packaging displays a visible symbol of the deposit system.

c) Paper / cardboard

The following grades of paper/ board are subject to an eco-tax of BF 10 / kilogram, unless containing before certain dates the legally required proportions of recycled fibres, specified in the table below:

	Grade of paper	Percentage of recycled fibers
1.	Newsprint - except dailies	60 by 1 Jan. 1994
	Newsprint - only dailies	20 by 1 Jan. 1995
	"	40 by 1 Jan. 1997
2.	Corrugated board	60 by 1 Jan. 1994
	Cardboard (not in contact with food or medicines)	80 by 1 Jan. 1998
3.	Board for collapsible boxes	40 by 1 Jan. 1994
	Non-rigid packaging (not in contact with food or medicines)	60 by 1 Jan. 1998
4.	Magazine paper	20 by 1 Jan. 1995
	Non-glossy	40 by 1 Jan. 1997
5.	Writing paper	50 by 1 Jan. 1995
	Non-glossy, not incorporating wood, (incl. photocopy paper)	80 by 1 Jan. 1997
6.	Printing paper	50 by 1 Jan. 1995
	Non-glossy, not incorporating wood	80 by 1 Jan. 1997
7.	Household and sanitary papers	15 by 1 Jan. 1996
	"	30 by 1 Jan. 1999

The reduced eco-tax is BF 5/kilogram in case paper or cardboard is produced from non-chlorine bleached pulp.

The eco-tax regulation is presently under consideration and will likely be modified in the near future.

2.2 Regional regulations

2.2.1 Legal Framework

An **Interregional Co-operation Agreement** for packaging waste prevention and management has been agreed between the three Belgian regions in January 1997. This Agreement came into force on 5 March, 1997.

According to this Agreement, industrial packaging waste will have to be recycled/recovered as of March 1998 by those liable for such packaging. Consumer packaging waste will have to be recycled/recovered by retailers as of March 2000.

"Those liable", within the meaning of the agreement, are:

- the persons who have packed products for sale in Belgium or placed packed products on the Belgian market;
- the importers of packed products; and
- with respect to industrial packaging waste, the consumer of packed products.

Those who generate a minimum of 10 tonnes of packaging waste per year will have to:

1) submit a "General Prevention Plan" to the Interregional Commission for Packaging. This Plan shall describe objectives and tools for being able to:

- increase the share of re-usable packaging;
- increase the share of recyclable packaging waste;
- improve the quality of packaging (waste) for promoting re-use and recycling;
- reduce the harmfulness of packaging waste and environmental impacts of waste management; and
- reduce quantities of non-re-usable/non-recyclable packaging.

2) take back their packaging waste.

These obligations must be fulfilled either by those liable for packaging waste or by a licensed public or private consortium. Those liable must also inform the Interregional Commission for Packaging on the option chosen.

The **Interregional Commission for Packaging** is a legal institution. Its role is to:

- agree on the General Prevention Plans;
- grant agreements/licences to private or public consortiums assuming packaging waste take-back obligations;
- set the level of financial guarantees for such organisations;
- ensure that those liable for packaging waste have fulfilled their obligations;
- produce statistics; and
- control the accuracy of all received information.

The licensed consortiums, which assume obligations on packaging waste from households, will have the following duties:

- to ensure waste collection, recovery and disposal throughout Belgium;
- to meet the recovery and recycling rates mentioned in the Agreement (see 4.2.3);
- to serve the same proportion of population in each region;
- to set contributions of its members for each type of packaging material;
- to ensure and increase employment through packaging waste recovery/recycling consortiums; and
- to comply with collection targets determined by local authorities.

Retailers are obliged to organise the take-back of industrial packaging waste, and consumers of industrial packaging have to use this service or organise recycling/recovery by themselves.

2.2.2 Sphere of Application

All packaging waste from industrial and household origin.

2.2.3 Specific Goals and Objectives

The Interregional Co-operation Agreement aims at:

- preventing or reducing the generation of packaging waste and its harmfulness;
- ensuring a continuous increase of the share of re-usable packaging and decrease of the weight of packaging waste;
- promoting re-use, recycling and recovery in order to reduce packaging waste landfilling or incineration without energy recovery; and
- forcing those liable for packaging to cover all costs of packaging waste collection, recovery and disposal through the establishment of compulsory take-back systems.

Recycling and recovery targets for all types of packaging waste are the following (expressed as a percentage of the total weight of packaging waste from household origin):

	1997	1998	1999	2000
Recycling	48 %	48 %	51 %	52 %
Total recovery[1]	60 %	70 %	80 %	80 %
Served population (Million inhabitants)	6	7.5	9	10.1

2.3 The "FOST PLUS" Collection system

As a result of the Interregional Co-operation Agreement, the industrial sectors have voluntarily established a consortium to organise collection and recycling of household packaging waste.

Thus, on 28 March 1994 fillers, importers of packaged products, manufacturers and importers of packaging components, trade associations and retailers set up the **"FOST PLUS"** organisation for the *packaging sector*. This organisation was registered as a co-operative company with limited liability (SARL), and is now requesting the approval from the Interregional Commission.

[1] Includes incineration with energy recovery.

The direct legal framework for FOST PLUS is established at the level of the Wallonia, Flanders and Brussels regions.

2.3.1 Organisation and activities of the system:

FOST PLUS organises, co-ordinates and provides financial support to municipalities for separate collection, sorting and recycling of materials, which is economically viable and environmentally sound (i.e. for packaging glass, paper and cardboard, plastic bottles, metals and beverage cartons). FOST PLUS must fulfil the above mentioned (see section 4.2.3) recycling and recovery rates set by the Interregional Co-operation Agreement on household packaging.

As of 1998, separately collected industrial and commercial packaging waste will also have to be recycled and recovered at the rates of 56% and 70 % in 1998, and reach 64% and 80% respectively in the year 2000. It is planned that FOST-PLUS be responsible for developing and controlling selective collection and recycling for that kind of packaging waste.

2.3.2 Funding

The FOST PLUS system is funded from contributions derived from contracts that grant use of the "Green Dot" symbol. In 1996, FOST PLUS had approximately 1,750 contracts which represented approximately two-thirds of the sales packaging on the Belgian market and whose contributions provided about 1.5 billion Belgian Francs.

The tariff is based on the actual cost of the separate collection, sorting and recycling per type of material (according to packaging weight) and on quantities of collected and recovered materials. Material based tariffs for 1997-98 are the following:

Materials	BF/kg[2]
glass bottles[3]	0.31
paper/cardboard >85%[4]	0.33
steel	1.34
aluminium >50%[4]	2.96
PET bottles	8.21
PVC bottles	8.27
HDPE bottles	8.27
beverage cartons	5.70
other	13.63

2.3.3 Use of financial resources

FOST PLUS covers:

- total actual costs of selective collection and sorting;
- possible negative prices of secondary raw materials (e.g. paper and PET); and

[2] Belgian Franc per kg without the VAT
[3] except for pharmaceutical packaging
[4] the percentage indicates the relative weight of the material compared to the total weight of the packaging

– information and education campaigns.

Identifying Symbol

FOST PLUS uses the “Green dot” symbol as a proof that the producer of a particular package is financially supporting selective collection, sorting and recovery. However, the Green Dot does not signify that the package is made out of recycled materials nor that it will be selectively collected or recycled.

3. FRANCE

3.1 Legal framework

The Decree N° 92-377 of 1 April 1992, the **Household Packaging Waste Decree,** deals with the avoidance, recycling and recovery of household packaging waste. It entered into force on 1 January 1993.

The Law N° 92-646 of 13 July 1992 provides provisions on waste management. Waste prevention has the highest priority, followed by recycling and/or energy recovery. It restricts landfilling to cover only "ultimate residues" by 2002. It requires the development of household waste disposal plans for every “département”, introduces a landfill tax, and demands a recovery rate of 75% for household packaging waste. Recovery requirements shall be applied to all packed consumer products marketed in France.

The Decree N° 94-609 of 13 July 1994, the **Industrial and Commercial Packaging Waste Decree,** covers avoidance, recycling and recovery of non-household packaging waste. It entered into force on 21 September 1994 for paper and board; and on 21 July 1995 for other packaging materials.

Household Packaging Waste Decree

Producers of consumer product packaging (product manufacturers, fillers, importers, distributors) are obliged to recover household packaging waste. If a producer cannot be identified, the requirement applies to that responsible for initial marketing a packed product.

According to Decree N° 92-377 producers of packaging have three options available:

i) use of a deposit system;
ii) establishment of an individual recovery system (needs an authorisation); and
iii) joining to a private consortium which assumes mandatory recovery requirements.

The Decree recognises energy recovery, in addition to recycling, as a means of acceptable recovery operation.

The Household Packaging Waste Decree does not specify any recovery quotas. The EU Packaging and Packaging Waste Directive (94/62/EC) has however been implemented by the Decree of 18 November 1996 concerning “département” oriented waste disposal plans.

Industrial and Commercial Waste Packaging Decree

Liable under the terms of the decree are the final users who separate the product from the packaging (e.g. company, business).

The decree offers those liable 3 possible ways of carrying out their obligations:

- setting-up their own recovery system;
- concluding a contract with recovery plants; and

- concluding a contract with a so-called "intermediary" company which assumes responsibility for transport and trading of packaging materials.

No targets are specified in the decree.

3.2 Sphere of application

Household Packaging Waste Decree:

All packaging materials, the final users of which are households.

Industrial and Commercial Packaging Waste Decree:

All packaging materials, the final users of which are not households.

3.3 Specific goals and objectives

The objectives of the two decrees are:

- recovery of packaging waste; and
- diversion of materials from landfill sites.

The means are:

- re-use of packaging;
- recycling of packaging waste; and
- energy recovery of packaging waste.

3.4 Collection systems

3.4.1 ECO-EMBALLAGES, S.A.

On 12 November 1992 Eco-Emballages was granted a licence from the government to operate as a private company with a public service obligation. This licence expired in 1996 but was extended for 6 years, pursuant to the Decree of 30 August 1996. Eco-Emballages is set up with the aim of organising the recovery of household packaging waste only as a private consortium of producers.

Eco-Emballages:

- is committed to ensure, by the year 2002, the recovery of at least 75% of household packaging waste, either through recycling, composting or incineration with energy recovery;

Recovery targets for Eco-Emballages[5]

Materials	Targets for 1997	Targets for 2002
Glass	52.5%	60-80%
Paper/Cardboard	6.4%	25-30%
Plastics	2.6%	15%
Steel	23.1%	50-60%
Aluminium	12.4%	35-40%

- receives contributions from companies which have voluntarily contracted with Eco-Emballages (currently about 9000) and, consequently, are exempted from the legal requirement (according to the Decree of 1 April 1992) to recover or dispose of their own packaging arising in households. The conclusion of contracts allows product manufacturers and importers to use the Eco-Emballages "green dot" logo. Approximately 91% of products sold to households in France are marked with this logo; the average contribution is 1 centime per unit of packaging, but it is supposed to increase up to 3 centimes in the upcoming years.

Contributions concerning containers are volume based and per package, as follows:

< 50 ml = max. 0,1 centime (ct)
50-100 ml = 0,1 ct.
101-150 ml = 0,25 ct.
151-200 ml = 0,5 ct.
201-3000 ml = 1 ct.
3001 ml-30000 ml = 2,5 ct.
> 30 litres = 10 ct.

and, concerning other types of packaging, weight based:

Glass :	5 cts/kg
Tinplate :	10 cts/kg
Plastics :	50 cts/kg
Aluminium :	50 cts/kg
Cardboard / paper / carton :	30 cts/kg
Wood :	30 cts/kg
Other packaging materials :	30 cts/kg

[5] Quotas according to the licence from the government.

[If the packaging waste is a mixture of several materials, the contribution is calculated according to the predominant material.]

- provides local communities with funding for the extra costs incurred in setting up selective waste collection and sorting;
- guarantees that sorted used packaging is taken back and recycled by the materials sectors. Eco-Emballages has contracted with five companies for reprocessing the following materials: steel, aluminium,paper/board, plastics and glass; and
- is accountable to the public authorities which assess the conditions of its activity. Eco-Emballages has also to report to a special committee on its programme development, balance sheets and budget. This special committee, which includes all key players (consumers, environmental organisations, distributors, manufacturers, packaging and packaging materials producers, public authorities, waste management and recovery companies, ministries) ensures that Eco-Emballages operations conform with current legislation and that recovery targets are met. It also provides advice on the issuing and withdrawal of licences.

ECO-EMBALLAGES gives a financial contribution to the district authorities, which voluntarily launch separate collection and sorting of used packaging, according to the following principles:

- per tonne of collected and sorted material; and
- for public relations activities, provided that the district authorities have concluded a contract with Eco-Emballages which has the status of a "pilot scheme" ("contrat site-pilote").

Financial support of Eco-Emballages according to the type of material

Material	Financial contribution in FF/Tonne	Buyer's purchase price FF/Tonne	Minimum profit for the district authority in FF/Tonne
Steel originating from:			
- slags & compost	75	0 or 50	75 or 125
- selective collection	300	50 or 200	350 or 500
Aluminium originating from:			
- slags	500	750	1250
- selective collection	1500	1000	2500
Paper/Cardboard (selective collection)			
yield <5kg/year/inhab.	750	0	750
yield: 5-15kg/year/inhab.	750-1650	0	750-1650
yield>15kg/year/inhab.	1650	0	1650
Plastics (selective collection)			
yield<2.5kg/year/inhab.	1500	0	1500
yield:2.5-5kg/year/inhab.	1500-4750	0	1500-4750
yield>5kg/year/inhab.	4750	0	4750
Glass			
- voluntary deposit	20	150	170
- door-to-door	50	150	200
+ support for remote areas	0-70		

The district authorities can conclude long term contracts with Eco-Emballages. The length of the contract is 6 years. The contracts have to cover all packaging materials and meet a short term recovery quota of 50% of household packaging waste and, at the end of the contract: that of 75%.

To get more experience on separate collection and sorting, Eco-Emballages has selected 40 pilot projects for which special financial aid is allocated for investments (e.g. for new collection vehicles, sorting plants).

By the end of 1997, 25 million people will be covered by multi-material sorting and recovery programmes. All major cities and urban areas are involved, including Paris and its suburbs, Lille, Nantes, Metz, Bordeaux, Montpellier, Strasbourg, Mulhouse.

Financial results

In 1996 the total income of Eco-Emballages was FF 570.7 million, of which FF 561.8 million came from the Green Dot fee paid by the member companies to Eco-Emballages. This total income was 4.6% higher than on the previous year (545.7 FF million).

Since its creation, Eco-Emballages has always been successful in controlling expenses. By sharing recycling costs among producers, local communities and material sectors, the French system does not financially overload any one particular actor of the materials chain, thus making it economically viable and socially acceptable.

3.4.2 ADELPHE

In addition to Eco-Emballages, a company called “Adelphe” was set up on 24 January 1993 to collect and recycle glass packaging. The legal framework for “Adelphe” is also the Decree No. 92-377 of 1 April 1992.

Adelphe’s agreement has been extended for 6 years from 1st July 1996 and now includes the authorisation to experimentally organise in certain regions separate collection for different packaging waste materials.

The **shareholders** are the manufacturers and bottlers of the French wine and spirits industry. Almost 12 000 wine and spirits companies have already contracted with Adelphe and the total of their contribution amounts to 36 millions francs.

Adelphe now collects all types of packaging but is specialised mainly in rural areas and still in glass packaging.

For the years following the extension of the Agreement, **targets** have been set for Adelphe: Adelphe has to cover 100 000 inhabitants in 1997 and 200 000 in 1998. The 1997 target has already been met since 110 000 inhabitants are already benefiting from Adelphe’s services.

Adelphe is linked with Eco-Emballages by means of a co-operation agreement (non-contractual). This agreement specifies the sharing of responsibilities.

Funding is via licensing agreements with beverage, mainly wine and spirits, fillers and importers. Both the licence fee and the licence symbol are similar to those of Eco-Emballages. Revenues are used to subsidy part of the investment of local communities for separate collection (e.g. purchasing of

bottle banks) and to buy collected materials for recycling. Prices are the same as those practised by Eco-Emballages (see above Section 2.4.1).

3.4.3 CYCLAMED

The creation of "Cyclamed"is a voluntary initiative from the private sector. It has been established on 20 September 1993 and licensed by a ministerial decree for a period of 3 years. The extension of its mandate is currently under consideration.

Cyclamed is an autonomous system run by the pharmaceutical industry, independent of Eco-Emballages and aimed at organising the **collection of outdated and/or discarded medicines and their associated packaging**.

Funding is via manufacturers and importers of pharmaceutical products: the payment is 0.03% of their turnover to Cyclamed. Chemists and wholesalers receive no financial support.

Organisation of the system:

- dispensing chemists (pharmacies) receive green bags to pass on to their customers;
- customers bring the bags filled with medicines or medicine packaging back to the chemists;
- sorting takes place at the chemist's; and
- wholesalers submit the collected packaging materials, including medicines, for incineration.

3.4.4 COLLECTION OF INDUSTRIAL AND COMMERCIAL PACKAGING

Producers and owners of industrial and commercial packaging waste are responsible for the recovery of their packaging wastes, in the context of the Industrial and Commercial Packaging Decree N°94-609.

In that context, they have set up specific voluntary collection and recovery systems, for example:

- *Eco-Bois* for wood packaging (develops re-use of wooden pallets);
- *Eco-PSE* for polystyrene packaging;
- *Eco-FUT* for polyethylene and polypropylene barrels;
- *Recyfilm* for plastic film;
- *Recyclacier* for steel packaging; and
- *Grow* for light wood packaging.

4. GERMANY

4.1 Legal framework

The Packaging Ordinance of 12 June 1991.

(Note: The Packaging Ordinance is currently under review for amendment, therefore some of the information below may be subject to change.)

4.2 Basic procedure

Overall aim of the Packaging Ordinance: to relieve the strain on landfills and waste incineration plants by avoiding packaging wherever possible and by re-using and recycling used packaging. Recycling of the material has priority over any other form of waste disposal, and over incineration in particular.

The ordinance lays down in three stages the take back of transport, secondary and sales packaging by the manufacturer or the retail sector.

Stage one of the Packaging Ordinance:

Since 1 December 1991 manufacturers and sellers have been obliged to take back *transport packaging*.

Transport packaging includes barrels, canisters, sacks, pallets and foam shells etc. It is designed to protect the goods when being transported from the manufacturer to the retail sector.

The packaging taken back has to be re-used or recycled outside the public waste disposal system.

Various operators in Germany currently deal with the disposal of individual types of transport packaging (Interseroh, VfW etc.).

Stage two of the Packaging Ordinance:

Since 1 April 1992 the retail sector has been obliged to take back what is known as *secondary packaging*.

Secondary packaging is the term used to describe additional packaging on top of sales packaging which either allows self service, serves advertising purposes or makes theft difficult (e.g. foil, cardboard, blister packs).

Retail outlets cannot evade this obligation to take back packaging by establishing a collection system close to households. They are obliged to set up collection containers in the vicinity of the point of sale.

Stage three of the Packaging Ordinance:

An important component of the Packaging Ordinance is the obligation to take back *sales packaging*. Since 1 January 1993 retail outlets have been obliged to take back used sales packaging at or in the immediate vicinity of the point of sale.

Together with industry they must re-use the packaging which has been taken back or recycle it outside the public waste disposal system. A compulsory deposit has also been introduced for certain packaging (beverage, detergents, cleaning agents and latex paints).

Industry is exempt from this obligation to take back packaging and charge deposits on it if it takes part in the comprehensive system to collect, sort and recycle valuable packaging materials (known as the Duales System Deutschland, the dual system of Germany). What is termed the "exemption" from the individual obligation to take back packaging and charge deposits on it had been granted in all Länder by 1 January 1993.

4.3 Sphere of application

All packaging except for packaging contaminated by pollutants.

4.4 Specific goals and objectives

According to the Packaging Ordinance, the following collection quotas apply where the dual systems have been set up.

	1 January 1993	1 July 1995
Glass	60 %	80 %
Tinplate	40 %	80 %
Aluminium	30 %	80 %
Cardboard, carton	30 %	80 %
Paper	30 %	80 %
Plastics	30 %	80 %
Composites	20 %	80 %

According to the Packaging Ordinance, the following sorting quotas apply:

	1 January 1993	1 July 1995
Glass	70 %	90 %
Tinplate	65 %	90 %
Aluminium	60 %	90 %
Cardboard, carton	60 %	80 %
Paper	60 %	80 %
Plastics	30 %	80 %
Composites	30 %	80 %

This produces the following "effective" minimum quotas for recycling of material:

	1 January 1993	1 July 1995
Glass	42 %	72 %
Tinplate	26 %	72 %
Aluminium	18 %	72 %
Cardboard, carton	18 %	64 %
Paper	18 %	64 %
Plastics	9 %	64 %
Composites	6 %	64 %

The planned amendment to the Packaging Ordinance will result in an extension of the deadline for achieving the recycling quotas, as follows:

	1 January 1996	1 July 1998
Glass	70 %	70 %
Tinplate	70 %	70 %
Aluminium	70 %	70 %
Cardboard, carton	50 %	60 %
Paper	50 %	60 %
Plastics	50 %	60 %
Composites	50 %	60 %

Irrespective of the target quotas, all collected and sorted packaging is to be recycled as a matter of principle.

In order to protect existing systems for re-usable containers, the Packaging Ordinance stipulates that the proportion of re-usable bulk beverage containers should not be allowed to drop below the quota of 72 per cent which existed at the time that the Ordinance was adopted. For pasteurized milk the proportion must be 17 per cent. If this quota is not met, a compulsory deposit will be imposed on the beverage concerned.

4.5 Collection systems

On 28 September 1990 the "Duales System Deutschland GmbH for the avoidance of waste and recovery of secondary raw materials (DSD)" was established as the organisation responsible for a private-sector collecting and sorting system for *sales packaging* from 95 companies in the packaging and consumer goods industry and the retail sector. Its aim is to establish a comprehensive infrastructure for collecting used packaging, and to organise subsequent recycling. Six hundred organisations have now joined DSD.

Once the comprehensive collecting system had been set up and the collecting and sorting quotas stipulated for this period had been reached, the environment ministers of the Länder in the Federal Republic of Germany granted Duales System Deutschland exemption as of January 1, 1993. This

exempted companies/ the retail sector from the direct obligation to individually take back packaging as stipulated in the Packaging Ordinance.

Duales System Deutschland has also recorded the proper recycling of different types of material in what is known as a "quantity stream document" for each Land.

Structure of the system:

The Packaging Ordinance demands that existing systems for collecting recyclable materials be integrated when dual systems are introduced. Therefore, there is no uniform collecting system for sales packaging in Germany.

The collection of used sales packaging varies according to the packaging material. Glass and paper are collected using the existing collection and container points ("drop-off systems"). Packaging made from tinplate, aluminium, plastics or composites is collected by the consumer in the bins or "bags for recyclable materials" available to households.

Municipal or private waste disposal companies are responsible at local level for collecting packaging accumulated in this way and for the subsequent manual or industrial sorting of the packaging.

In order to carry out these activities DSD has signed waste disposal contracts with the relevant companies. These contracts regulate, among other things, the provision of containers, regular collection, sorting and if necessary transportation to the recycling companies.

The sorted packaging is then made available to the respective raw materials industries or to the companies which have been established especially to recover the secondary raw materials, so that they can be returned to the raw materials cycle. The parties involved undertake, by giving what are known as acceptance and recycling guarantees to DSD, to recycle the returned and separated packaging in line with the Packaging Ordinance.

Packaging from foreign companies is also collected under the Duales System Deutschland scheme if a relevant recycling guarantee has been given for the packaging material concerned.

4.6 Funding

Packaging which is part of the Duales System Deutschland scheme is marked with the **"Green dot"**. The Green dot is a registered trademark and can therefore be printed on packaging only for a fee. The Green dot can be acquired only if there is a recycling guarantee for the relevant packaging material. As of August 1994, Duales System Deutschland scheme has more than 17,600 subscribers.

Through the Green Dot the costs of collecting, sorting and processing packaging material are borne by the manufacturer or the retail sector in line with the "polluter-pays" principle.

An amendment to the fee system came into force on October 1, 1994. Under this amendment, the structure of the existing schedule of fees based on materials and weight was maintained. In addition to the material-specific weight charge, a fee per unit related to volume and area is to be levied as a basic amount (excluding small packaging). The introduction of fees per unit take account the increased collecting and sorting quotas from July 1995, on the one hand, and, on the other hand, every item of packaging theretofore contributed a basic amount towards covering the costs of the disposal system.

The total amount, expected for 1995, was about 4 billion DM.

The new schedule of fees applies to industrially filled packaging as well as service packaging and disposable tableware.

Material- and weight-related schedule of fees:

Glass :	0, 15 DM / kg
Paper / cardboard / carton :	0, 40 DM / kg
Tinplate :	0, 56 DM / kg
Aluminium/other metals :	1, 50 DM / kg
Plastics :	2, 95 DM / kg
Beverage cartons :	1, 69 DM / kg
Other composites :	2, 10 DM / kg
Natural materials :	0, 20 DM / kg

Schedule of charges per unit

Volume schedule

Volume	Pfennig/ Unit	Category
< 50 ml and <= 2g, cumulative	0,10	V. 1
< 50 ml, packaging portion per 15 units	0,20	V. 2
< 50 ml and > 2 g	0,20	V. 3
50 - 200 ml and <= 3 g, cumulative	0,30	V. 4
50 - 200 ml and > 3 g	0,60	V. 5
> 200 - 400 ml	0,70	V. 6
> 400 ml - 3 l	0,90	V. 7
> 3 l	1,20	V. 8

Area schedule

Area	Pfennig/ Unit	Category
< 150 cm^2 and <= 2g, cumulative	0,10	F. 1
< 150 cm^2, packaging portion per 15 units	0,20	F. 2
< 150 cm^2 and > 2 g	0,20	F. 3
150 - 300 cm^2 and <= 3 g, cumulative	0,30	F. 4
150 - 300 cm^2 and > 3 g	0,40	F. 5
> 300 - 1.600 cm^2	0,60	F. 6
> 1.600 cm^2	0,90	F. 7

The costs are to be paid by the filler and the importer. The retail sector has undertaken to bear the costs incurred by the filler.

Examples for the "Green dot" fee per packaging

Plastic bag (packaging for bread)	0,0211 DM
Beverage can (tinplate/ aluminium)	0,0296 DM
Food can (tinplate)	0,0456 DM
Bottle for sparkling wine	0,196 DM

4.7 Supervision

Execution of the Packaging Ordinance is monitored by the relevant Länder authorities (usually the environment ministers of the Länder or the waste authorities). The Packaging Ordinance demands of the DSD that from 1993 it should provide these environment ministries annually with documentary evidence of the proper collection, sorting and recycling (quantity stream document). If this is not properly carried out in a Land, the respective environment minister can revoke the DSD's exemption from the obligation to take back packaging with respect to the particular State and material in question. Then the retail sector would have to take back the packaging material within six months.

The Technical Supervision Associations (TÜVs) monitor exports of secondary raw materials in the plastics and paper sector.

4.8 Use of financial resources

To operate the Duales System Deutschland scheme.

4.9 Identifying symbol

The Green Dot

This identifies packaging which is collected and recycled within the Duales System Deutschland scheme and for which the appropriate financial contribution (license fee) is paid. Domestic and foreign companies can conclude contracts permitting them to use the Green dot.

5. JAPAN

5.1 Legal framework

The "Packaging Recycling Law" of 16 June 1995 (official name: "Law for Promotion of Separate[6] Collection and Recycling of Containers and Packaging"): in the following description of the program, "packaging" will usually be used to include "containers" unless there is a separate discussion of "containers".

5.2 Basic procedure

Aim of the Packaging Recycling Law: to promote the separate collection and recycling of waste containers and packaging, with the aims of achieving a reduction in the volume of waste and the effective utilisation of recycled resources. (Art. 1)

From 1 April 1997, the recycling obligation will apply to large companies for glass bottles and PET containers. From 1 April 2000, obligations will also apply to paper and plastics packaging, as well as small and medium enterprises for all types of packaging. This schedule is common to the whole country.

The law lays down three stages for its implementation (Schedules, Art. 1):

Stage one of the Packaging Recycling Law:

No later than 16 December 1995, or by a date within six months from the date of proclamation, a group of national ministries shall establish a "Packaging Waste Separate Collection and Recycling Principle" (Art. 3), the basic policies for sorting criteria and the collection and recycling of packaging waste that meet the criteria.

In this context, basic policies were established on 25 March 1996. These basic policies serve as a guideline for the ministers' recycling plans (Art. 7) to meet the policies.

Stage two of the Packaging Recycling Law:

No later than 16 June 1996, or by a date within one year from the date of proclamation, municipalities could establish or announce (Art. 8) and prefectural governments could promote (Art. 9) programmes for the separate collection of packaging waste in their respective jurisdictions. This is to be done in accordance with the national "Packaging Waste Separate Collection and Recycling Principle" (Art. 3) and the plans of the national ministries (Art. 7). Municipalities can establish the programmes and prefectures collect the programmes, make them public, and submit them to national government until the end of 15 November 1996.

The definition of packaging fillers (who share the primary responsibility for collection and recycling with container manufacturers) does not include the distribution chain to the retailers as also sharing the primary responsibility. However, when an actor in the distribution chain newly attaches packages to a product, it should be responsible for recycling those packages.

[6] Editor's note - we would change "sorted" to "separate" (although both meanings are very close).

Stage three of the Packaging Recycling Law:

No later than 16 June 1997, or by a date within two years from the date of proclamation, a municipality shall carry out or implement its announced programme for the separate collection of packaging waste in its jurisdiction. In this context, separate collection will now be implemented from 1 April 1997. The municipality shall make known its separate collection criteria to its residents, who must comply with the criteria and sort packaging waste correctly before taking it to the places of collection. (Art. 10)

Recycling of collected packaging waste is the responsibility of business, defined as container and packaging "fillers" (Arts. 2.9, 11, 13) and container "manufacturers" (Arts. 2.10, 12).

In a strict sense, packaging (as opposed to container) manufacturers are not responsible for recycling. The main reason being the difficulty of knowing the usage i.e., for households or factories, accurately. The scope of the responsible producer is different between "container" and "package". The government does have authority (Art. 2.2) , however, to designate certain packagings as containers for which manufacturers do have primary responsibility.

5.3 Sphere of application

All packaging (including containers, collectively herein described as "packaging", unless otherwise noted) of commercial products. (Art. 2) Imports are included (Arts. 2.9, 2.10); exports are exempted (Art. 11.1, 12,1, 13.1).

Small businesses are exempted in whole or in part from the requirements of the Japanese Packaging Recycling Law. (Art. 2.11.(4), Schedules, Art. 2). However, from 1 April 2000, obligations of the Packaging Recycling Law will also apply to small and medium size enterprises for all types of packaging.

5.4 Specific goals and objectives

For each manufacturer and filler (including importer), the national ministries establish required recycling responsibility rates or quotas. These are calculated as a percentage of the manufacturer's or filler's total volume of packaging that meets the sorting criteria of the national policy and thus is covered by the law. (Art. 11.2, 12.2, 13.2)

These quotas are based on the type of packaging or material (in particular, aluminum, steel, non-coloured glass, brown glass, other glass, paper-pack, cardboard, other paper, PET bottles, other paper, other plastics). The quotas are in the process of being established.

5.5 Collection systems

A manufacturer or filler with the primary responsibility to recycle packaging waste can do so in several ways. With the approval of the national ministries, it can itself collect waste for which it is responsible, or it may contract with another company to collect and return its waste. (Art. 18); the approval of the national ministries is also required of the recycling company (Art. 15).

Alternatively, the manufacturer or filler may join a producer responsibility organisation (PRO) approved by the national ministries, called a "designated body" (Art. 21). At present, it is planned to have one PRO. By signing a membership agreement called a "recycling contract" (Art. 23), the packager or

filler will be regarded as having performed its individual recycling responsibility (Art. 14), and thus exempted from individual responsibility. A PRO also is required to obtain the approval of the national ministries of its recycling methods, to submit annual plans and reports for approval, to not discriminate against applicants for membership, to not suspend or cancel any recycling work without governmental permission, to keep account books and records, and to allow governmental inspections, or it may lose the official designation that qualifies it to act as a producer responsibility organisation. (Arts. 24-32)

Municipalities are not involved with the establishment and management of the "designated body".

Utilisation of recycled materials is required of manufacturers and fillers that are able to do so (Art. 36), and account books must be kept to record details as required by national ministries regarding sales of packaged products, use of packaging, and recycling of items or materials as required (Art. 38). Manufacturers and fillers must submit reports upon request (Art. 39) and allow governmental inspections (Art. 40).

Quotas for the utilisation of recycled materials are under development.

A manufacturer or filler that without justifiable reason fails to perform its share of recycling (fails to meet its required recycling responsibility rate or quota as set by the national ministries), may receive from the national ministries guidance and advice, instructive recommendations, and finally an order to take action. (Arts. 19, 20)

5.6 Funding

Subject to approval by the national ministries, the PRO may charge fees to its members (Art. 23), provided it keeps account books and records and allows governmental inspections (Arts. 29, 30). The law requires that for each PRO the national ministries shall determine that the calculation method for its membership fees is clear and appropriate (Art. 24) and shall pre-approve an annual Operating Plan and Income and Expenditure Budget (Art. 25).

PRO fees will be material- and quantity-related. At present there are no plans to link the fees to a "Green Dot" or some other packaging marker.

5.7 Supervision

Execution of the law is monitored by the national ministries responsible (Art. 43). As previously indicated, there are legal obligations on manufacturers and fillers and their "designated bodies" to keep account books and records, submit plans and reports, and allow inspections.

A schedule of violations and monetary fines, applicable both to individual employees or representatives and to their business manufacturers and fillers or corporate employers (Art. 49), is established under the law as follows:

A packager or filler that without justifiable reason fails to comply with an Article 20 order to take action to meet its required recycling responsibility rate or quota as set by the national ministries), may be fined 500,000 yen (approximately 5,000 USD). (Art. 46)

A PRO can be fined 300,000 yen (approximately 3,000 USD) for:

(1) cancelling its recycling work without permission,
(2) failure to maintain and retain account books, or making false entries in them,
(3) failure to make required reports, or making false reports,
(4) refusal, obstruction, or avoidance of a required inspection. (Art. 47)

Any other person can be fined 200,000 yen (approximately 2,000 USD) for:
(1) failure to maintain and retain account books, or making false entries in them,
(2) failure to make required reports, or making false reports,
(3) refusal, obstruction, or avoidance of a required inspection. (Art. 48)

5.8 Use of financial resources

The fees collected by the PRO are used for packaging waste recycling, not collection. Packaging waste collection and separation remains the responsibility of municipalities in both physical and financial terms. Municipalities also bear the operating costs for facilities to handle the final residues from the recycling of packaging waste. *(Need to confirm whether municipalities also collect final residues for ultimate disposal/storage)*

5.9 Identifying symbol

At present, there is no plan for the use of a packaging marker or trademark.

ENDNOTES

1 Some comparative analyses of these programmes are writings by Akim Seyad, Filip Senesael, and Marc DeClercq, "Voluntary Collection and Recycling Initiatives for Packaging Waste: Critical Evaluation of the Belgian Fost Plus System," report presented at the "Greening of Industry Network" Conference (Toronto, November 1995) comparing the Austrian, Belgian, French, and German systems for managing packaging waste; and Christophe Defeuilley and Philippe Quirion, "Wastes from Household Packagings: An Economic Analysis of German and French Policies", Economie et Statistique, p. 69 (No. 290, 1995 - 10). More comprehensive is a recent book by Th. Demey, J.-P. Hannequaart, and K. Lambert, Packaging Europe - A Directive Standing up to Transposition into 15 National Laws (Brussels Institute for Management of the Environment, 1996), describing the European Directive for Packaging and Packaging Waste and the national packaging laws of 15 EU members. The German programme has been described by Bette K. Fishbein, "Germany, Garbage, and the Green Dot - Challenging the Throwaway Society", INFORM, Inc. (NY 1994); US EPA document EPA/600/r-94/179.

2 "Extended Producer Responsibility in the OECD Area - Phase 1 Report", p. 6 (Preface), OECD Environment Monographs No. 114 - OCDE/GD(96)48 (Paris, 1996), paraphrasing Professor Gary Davis.

3 Ibid., p. 8 (Executive Summary)

4 Allen Hershkowitz, "How Garbage Could Meet Its Maker", The Atlantic Monthly, pp. 108-109 (June 1993)

5 Berthold Goeke and Francis Chalot, "Waste Stream Case Study - Packaging", Vol. 1 of *Washington Waste Minimisation Workshop - Five Waste Streams to Reduce*, pp. 46-47 (OECD 1996)

6 "Extended Producer Responsibility in the OECD Area - Phase 1 Report", pp. 13-14 (Executive Summary)

7 *Outcome of the International Workshop: Building the Basis for a Common Understanding on Waste Minimisation*, p. 19 (OECD, Berlin 1996)

8 Also, it will not be possible in this report to focus on EU Member state conflicts or issues under the EU Directive on Packaging and Packaging Waste, on the different parts (transport, secondary, primary, small-business) of the total packaging watt stream, or on specific issues attending re-use of refillables or informational markings on packaging. See: Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, throughout, and especially Ch. 5, "Re-use",and Ch. 4, "Information"

9 These and other voluntary EPR initiatives by producers in the US, where to date almost all progress has been voluntary, are described in The University of Tennessee Center for Clean Products and Clean Technologies, *Id.*.

10 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, pp. 3-4

11 Ridder, M., "Decree Would Require Electronics Sector to Plan for Equipment Collection, Recycling", *The International Environment Reporter Current Report*, vol. 19, no. 21., p. 930, Bureau of National Affairs (Oct. 16, 1996)

12 "Waste Avoidance, Recovery and Disposal Act", Articles 22, 24 (27 September 1994)

13 Council of Ministers of the European Union, "Resolution upon Strategy for the Management of Wastes", sec. 3.1.2 (December 9, 1996)

14 "Waste Avoidance, Recovery and Disposal Act", Art. 20 (27 September 1994)

15 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, pp. 42, 54-55

16 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, pp. 51-52.

17 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, p. 50.

18 "Waste Avoidance, Recovery and Disposal Act", Articles 16-18 (27 September 1994)

19 Fishbein, *Id.*, p. 74

20 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, Ch.. 6, "Economic Instruments", especially pp. 121-123, discusses the relationship between certain eco-taxes and fees (including those of the PROs of Germany and France) and the EU Directive on Packaging and Packaging Waste.

21 USEPA, *Pay-as-You-Throw: Lessons Learned about Unit Pricing* (EPA document/order no. EPA 530-R-94-004, Washington 1994). This is a guidebook for programme designers of local systems. See also, "Full Cost Accounting Resource Guide" (EPA 530-R-95-077) and "Making Solid Waste Decisions with Full Cost Accounting" (EPA 530-K-96-001).

22 Fishbein, *Id.*, p. 110; Akim Seyad, et al., *Id.*, p. 11

23 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, p. 67

24 Fishbein, *Id.*, pp. 72-83

25 "Extended Producer Responsibility in the OECD Area - Phase 1 Report", p. 32.

26 Jim Salzman, "Extended Producer Responsibility: Take-Back Programmes and International Trade Law". Unpublished OECD consultant report

27 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, Ch. 4, "Information", pp. 37-39

28 Gernot Klepper and Peter Michaelis, "Will the Dual System Manage Packaging Waste?", Kiel Working Report No. 503, p. 19, Kiel Institute of World Economics (Kiel, January 1992)

29 Patricia S. Dillon, "Salvageability by Design", IEEE Spectrum, p.18 (August 1994)

30 Th. Demey, J.-P. Hannequart, and K. Lambert, *Id.*, Ch. 4, "Information", pp. 73-79

31 Based on: "An Overview of Tools and Strategies for Environmental Management", p. 13, speech presented at "ECO 1997" International Congress (Paris, February 1997), by Bill L. Long, Director for Environment, OECD. See also: Barde, J.Ph, "Douze criteres pour choisir un instrument de politique environnementale", *Ecodecision* (January 1994)

32 Aart Dijkzeul, "Role of Prevention Versus Recovery/Recycling with Reference to Waste Minimisation", *Outcome of the International Workshop: Building the Basis for a Common Understanding on Waste Minimisation*, p. 105 (OECD, Berlin 1996)

33 Institute for Environmental Studies, Free University, Amsterdam, "Inventory of Product Policy Instruments" (Nov. 1993)

34 Without particular reference to EPR, the European use of non-regulatory, public-private "voluntary" environmental agreements has recently been described and experience in Member States has been surveyed. European Commission, "Communication from the Commission to the Council and the European Parliament on Environmental Agreements" (Brussels, Nov. 1996; document COM(96) 561 final); EC Directorate General III (Industry), "Study of Voluntary Agreements Concluded between Industry and Public Authorities in the Field of the Environment" (January 1997).

35 This sentence of the definition is similar to the EU's international definition of "recycling" in relationship to "recovery". Where more specific definitions are needed for "re-use", "recovery", "energy recovery", and "organic recovery", these may be found in the EU Directive 94/62/EC on Packaging and Packaging Waste, Art. 3 (20 December 1994). Further clarification may be found in the EU's recent Directive on Integrated Pollution Prevention and Control.

36 This definition of "recycling" necessarily differs from that of the OECD/Eurostat Questionnaire, "Wastes", p. 6 (1996), which elaborates the meaning of "recycling" more broadly and without limitation to municipal waste, which is the focus of EPR. This definition of "recycling" also differs from the broader definition of the EU Directive on Packaging and Packaging Waste, Art. 3, which does not identify the issue of whether all recyclers should or should not be treated as final product manufacturers having ultimate EPR responsibility.

37 In this report, "product" may be used to include or mean product "packaging", unless the meaning would be clearly inappropriate. International definitions of "packaging" and of "packaging waste" may be found in the EU Directive on Packaging and Packaging Waste, Art. 3. The "field of application" of this directive is discussed at Th. Demey, J.-P. Hannequart, and K. Lambert, Id., pp. 3-4. National EPR laws applicable to packaging do and should specifically define it..