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ENVIRONMENT DIRECTORATE
ENVIRONMENT POLICY COMMITTEE

Working Party on Pollution Prevention and Control

OECD JOINT WORKSHOP ON EXTENDED PRODUCER RESPONSIBILITY AND WASTE MINIMISATION POLICY IN SUPPORT OF ENVIRONMENTAL SUSTAINABILITY
Paris, 4-7 May 1999

PART 1: Extended Producer Responsiblity

This document is Part 1 of the final report of the compendium of the OECD Joint Workshop held on 4-7 May 1999. It contains the presentations and papers as presented at the EPR part of the workshop.

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FOREWORD

Over the past three decades, OECD governments, the private sector and others have spent considerable resources on pollution control and waste reduction. While there are improvements in pollution reduction and control at the facility level, waste generation is still on the rise. Statistics indicate that waste within the OECD has been increasing at a rate similar to that of economic growth. Unless different action is taken, additional landfills, incinerators and pollution will result.

To help OECD governments address the increase of waste and pollution, new policy concepts and instruments are being investigated and developed to provide longer-term solutions and increase resource efficiency. Extended Producer Responsibility is one new policy approach being examined by the OECD that could bring about such changes. The guidance and information provided under the OECD EPR work programme give governments an additional tool to help them tackle the growing problems of waste and pollution.

The EPR Programme at the OECD began in 1994. The purpose of the initial phase was to examine the legal and administrative approaches being implemented by Member governments and to identify common issues, countries were facing as they developed and implemented programmes.

Phase 2 of the OECD EPR Programme began in 1996. This phase involved the development of case studies on two existing EPR systems - the Dutch Packaging Covenant and the German Packaging Ordinance - and the development of the Phase 2 Framework Report. The Framework report incorporates findings from the case studies and raised certain issues to be explored further under EPR Phase 3.

The findings of Phase 1 and 2 serve as important input to Phase 3 of the EPR Programme. The aim of EPR Phase 3 is to develop a Guidance Manual for Governments wishing to establish EPR programmes. Four multi-stakeholder workshops were held over a one-and-a-half-year period to examine particular issues raised in Phase 2. About 100 persons attended each workshop.

The Environment Canada hosted the first OECD EPR workshop, Who is the Producer, in December 1997. The principal issues addressed in the second workshop, hosted by the Finnish Ministry of Environment, were trade and competition. The US Environmental Protection Agency hosted the third EPR workshop in December 1998. The key issues examined at this meeting were voluntary and mandatory EPR approaches their costs and their environmental effectiveness.

The fourth and final workshop on Extended Producer Responsibility was held in Paris in May 1999. This workshop, which was kindly hosted by the Ministry of Health and Welfare of Japan, was a Joint Waste Minimisation - Extended Producer Responsibility Workshop.

This document contains the presentations and papers as presented at the EPR part of the workshop, the workshop agenda and the list of participants, as well as the available documents from the opening and closing sessions of the workshop itself. The papers and presentations dealing with waste minimisation (Part 2) are issued in a separate document [ENV/EPOC/PPC(99)11/PART2].

The OECD would like to express its appreciation to those persons who prepared papers for the meeting and to those who made presentations. In addition, the OECD would like to thank the Government of Japan for kindly funding the OECD EPR Programme.

All general distribution EPR documents can be found at the OECD Environment Directorate site on the World Wide Web: http://www.oecd.org/ehs/waste/index.htm.

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WELCOMING ADDRESS BY JOKE WALLER-HUNTER, DIRECTOR

OECD ENVIRONMENT DIRECTORATE

Good afternoon ladies and gentlemen. I would like to take this opportunity to add a warm OECD welcome to this workshop and to thank the Japanese Ministry of Health and Welfare for offering to host this event in such an agreeable location.

The Dilemma

It may be appropriate to start with a **reality check**. As many of you know, during the 1990's most OECD Environment Ministries started embracing "source reduction" and "pollution prevention" as key goals. This meant that as little waste as possible was to be disposed of, and this objective was to be achieved with a **priority focus** on prevention efforts, generally followed by recycling.

Unfortunately, it has become clear that *in practice*, there exists a persistent **prevention paradox**. Overall, 65% of municipal wastes in OECD countries are still going for final disposal; moreover, most public and private waste-related **investment** is directed to recycling, not prevention. Some estimates indicate that prevention accounts for a mere 10-20% of overall minimisation efforts.

The dilemma doesn't stop there. I must also report to you that despite nearly 30 years of environmental and waste policy efforts in OECD countries, the OECD-wide increase in waste generation is still in 1:1 proportion to economic growth. A 40% increase in OECD GDP since 1980 has been accompanied by a 40% increase in municipal waste during the same period. As you can see, consumer spending also follows these trends.

According to projections of our colleagues in the Economics Directorate, there is expected to be a 70-100% increase in GDP by the year 2020 in the OECD area. I would personally not like to imagine a world where municipal waste generation is also 70-100% higher then the already high levels of today.

As I am sure you can all appreciate, the scope of this dilemma is, indeed, much broader than the generation of post-consumer municipal waste. Large increases in consumer demand can imply also more wastes associated with upstream activities such as extraction, manufacturing and distribution. Indeed, wastes are generated throughout the life of economic activities, through the flow of material cycles.

Since the early 90's, increasing attention is being directed to also those wastes generated at the *front-end* of the materials cycle. For example, recent work carried out by the World Resource Institute for four OECD countries [Germany, Japan, the United States and the Netherlands] indicates that hidden material flows from mining, earth moving, and other sources account for as much as 75% of the total materials that these industrial economies use.

All these statistics beg the question: ***Why*** *do we have a waste dilemma*? While the reasons are multiple, here are four points, which I think merit special attention:

- Consumers and producers do ***not*** **always pay the true social and environmental costs** of the wastes they produce.
- **Increases in demand** often outstrip any gains in production efficiency.
- It is often **cheaper to use virgin materials** than to recycle materials.
- **No agreed waste prevention indicators** exist; and human psychology dictates that if something can not be measured, it's much less likely to get done!

Links to other Challenges

As I think we all can see, waste as an environmental issue takes many shapes and forms. This means that the problem must not be compartmentalised. Rather, it must be **carefully** integrated with decisions affecting all environmental media, and all economic sectors. Integrated resource management can provide a useful stage for framing solutions to the dilemma.

Once again, though, we need to be realistic. Appropriate change in resource inputs does not come automatically at either the country or company level. For firms, the initial cost of redesigning products and minimising resource use can be high, with timeframes for change sometimes long. And the immediate benefits of such actions are often more public than private. The result can be insufficient private sector investment and inadequate innovation. Our research is revealing that EPR and waste prevention strategies can be important levers for achieving efficiencies in materials and energy use throughout the value-added chain of products. That, in turn, can help minimise negative externalities that have not always successfully been taken into account with historic waste management approaches.

A broad approach will help avoid secondary effects, some of which are familiar, some newer.

Most of us are aware that landfills can give rise to groundwater contamination, increased truck transport to and from waste facilities, and public resistance to facility siting – the now familiar NIMBY syndrome.

On **a national and global level**, there are also noteworthy areas of concern stemming from the fact that, traditionally, policies have not addressed the association between waste generation and**:** climate change, deforestation, toxic substance releases, biodiversity loss, increased soil erosion, and other problems.

Taking climate change as an example, we know that since 1990 there has been nearly a 10% increase in *waste-derived* ***methane*** emissions, a significant point because methane is approximately 24 times more potent a greenhouse gas than carbon dioxide. Studies coming out of the U.S. clearly demonstrate a considerably higher GHG mitigation potential associated with waste **prevention**, in comparison to any other waste minimisation activity including recycling.

In my mind, these simple but important observations have two overarching policy implications: (1) preventing wastes in the first place can also prevent the need for large **financial outlays** to fix secondary problems; and (2) only by nurturing and applying an **integrated approach** can we really start to understand and confront important linkages and trade-offs.

OECD Work on EPR and Waste Minimisation

The OECD work on EPR and Waste Minimisation has a short but fruitful history starting in 1994.

You can see that although the history is short, Member countries have been quite active in stepping forward, offering resources and hosting workshops for our EPR and Waste Minimisation work. We in the Secretariat have also been quite busy in preparing what totals to 8 official reports split between EPR and Waste Minimisation. Some of these papers have been among the most popular Environment documents produced at OECD. I know many of you have already obtained your own free copies of some of these through our Internet site.

Resource Efficiency and Sustainable Development

Within the work programme of the Environment Directorate, EPR and Waste Minimisation are two of the components of a broad activity called Resource Efficiency**,** which in its turn, is part of the broader notion of the sustainable development of natural resources. As you know, the OECD as a whole has stepped up its work on sustainable development in a three years horizontal programme that will hopefully have a lasting impact. Decisions in OECD countries on how to manage natural resources, are key to sustainable development. Work is well underway, and the first results will be presented in an interim-report that will be made available to Ministers when they meet later this month. The OECD 2001 report on Sustainable Development will then go into more depth. This will also assist us to further define the concept of resource efficiency and the related notion of resource productivity. No doubt that an efficient management of the resources is supportive of sustainable development. But there are still many policy and technology questions to be answered, before we have a workable definition.

Such questions form part of the longer-term objectives of the Resource Efficiency work in our Environment Programme. Our Resource efficiency work currently groups a number of activities**,** ranging from the valuation of natural resources, to the already more operational business concept of eco-efficiency, where we are now looking more in depth at economic sectors like food, construction and governments, and the topics on the agenda of this workshop.

The implementation of cutting edge approaches, such as EPR and waste prevention strategies, is, I believe, fundamental to the attainment of increased resource efficiency and a more sustainable development

Some simple examples of how EPR and waste minimisation approaches can help promote resource efficiency and sustainable development include: (1) designing low-waste products and services that lead to reduced resource extraction and energy use upstream and throughout the lifecycle; and (2) addressing consumer-producer relationships, defining their respective roles to help achieve environmental objectives.

Defining Success: A Caveat

As with any policy or programme, there comes a time when its performance requires evaluation. It is here that I would like to inject a caveat. **We all need to be vigilant in how we define success**. If the measure of success of a waste prevention programme is given only in terms of wastes not disposed of downstream, then it may come as no surprise that such a programme looks expensive and perhaps even over-engineered. Only by taking into account the *full range of benefits* can governments and private organisations better understand **the cost-saving, and innovation-enhancing** potential of properly designed waste prevention programmes.

With respect to EPR, this fuller range of benefits can **include reduced upstream use of materials and energy use**, better communication along the product chain, involving all actions and ultimately a reduced need for public funds to finance waste management.

Finally

This brings me back to our Workshop.This joint EPR/WM workshop will be an important opportunity to consolidate our knowledge on these topics and hence assist with the subsequent development of ***OECD guidance to governments.*** This OECD guidance will be developed on two levels: **(1) *strategic,*** by formulating a waste minimisation **Policy Options and Self-Assessment Guide** that is cast within a framework of economy-wide material flows; and **(2) *operational***, by developing a **Guidance Manual** for those governments considering the development and practical application of Extended Producer Responsibility programmes. The rich experience acquired during the last four years of our work on EPR, Waste Minimisation and related projects will be used in the development of these products.

What do we want from the next three days of discussions? Hopefully, we will come out with a better understanding of what's likely to work best in waste prevention and EPR strategies, in the context of promoting both resource efficiency and sustainable development. But more specifically, we should have a better idea of the types of ***questions*** *that governments should be asking themselves* when designing, implementing and evaluating such strategies.

I wish you all success with the meeting and I look forward to seeing the conclusions.

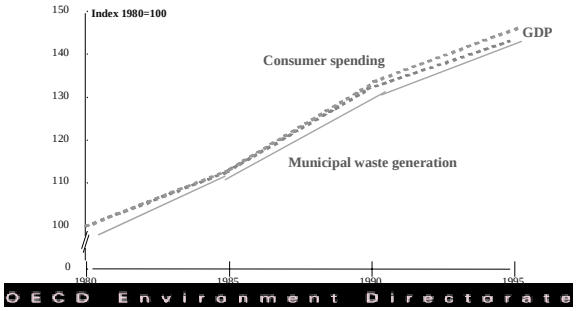
POWERPOINT PRESENTATION (Joke Waller-Hunter)

Joint Workshop on Extended Producer Responsibility
and
Waste Minimisation Policy

Joke Waller-Hunter, Director
OECD Environment Directorate

A DILEMMA

Trends in Waste Generation and GDP
OECD Countries



Why the Dilemma?

Reasons are multiple. Some key points include:

- environmental costs usually not paid by consumers and producers
- demand can outweigh efficiency gains
- virgin materials cheaper than secondary
- no agreed waste prevention indicators

OECD and EPR

Brief History

- **Phase 1 (1994-1996):** 70 personal interviews on legal/administrative approaches across OECD countries
  = Phase 1 Report
- **Phase 2 (1996-1997):** Commissioned report and Secretariat analysis on economic efficiency and environmental effectiveness of various approaches
  = Phase 2 case studies and synthesis Report
- **Phase 3 (1997-2000):** Series of multi-stakeholder workshops [Ottawa, Helsinki, Washington, Paris(Japan)]
  = ***EPR Guidance Manual to Governments***

OECD and Waste Minimisation

Brief History

Phase 1 (1994-1996): Washington Workshop + Lead country Work (policies/tools/waste streams)
= Phase 1 Report

- **Phase 2 (1996-1997):** Commissioned reports and Secretariat analysis (concepts/approaches/country profiles/WM evaluation primer) + Berlin Workshop
  = Phase 2 case studies and synthesis report
- **Phase 3 (1997-2000):** Commissioned reports and Secretariat analysis (prevention targets, indicators and improvement strategies) + Paris (Japanese) Workshop
  = ***Policy Options and Self-Assessment Guide***

Sustainable Development: Tentative Outline of Analytical Report (2001)

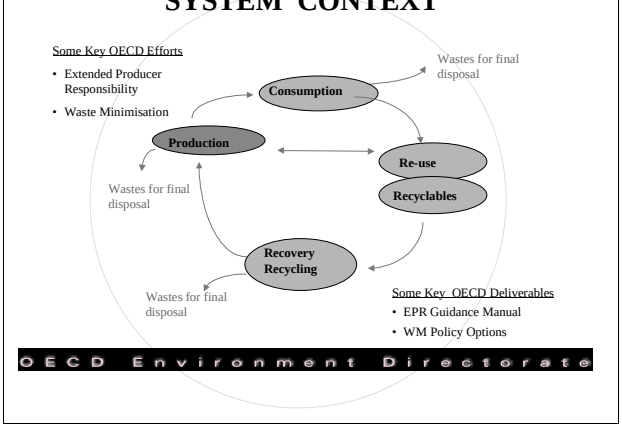
- **Part A**. The Outlook for Sustainable Development
  - Challenges and opportunities on the economic, environmental and social sides
- **Part B.** A Policy Framework for Sustainable Development
  - Key Policy Principles
  - Measurement
  - Institutions and Decision Making
  - Enhancing Framework Conditions for Sustainable Development
  - Technology and Sustainable Development
- **Part C**. Policy Responses: Key Issue
  - The management of natural resources
  - Responding to climate change
- **Part D**. Policy Responses: Sectoral and Local Approaches
  - Energy
  - Transport
  - Agriculture
  - Local Approaches
- **Part E**. Globalisation and Sustainable Development
  - Trade, Investment and Sustainable Development
  - Strategies for Enhancing Sustainable Development in Developing and Non-Member countries

Resource Efficiency

What are components of the OECD Resource Efficiency activity?

- Approaches and Policies:
  - ***EPR***
  - ***Waste Minimisation***
  - Product Policies
- Natural Resource Evaluation
- Eco-efficiency: the practice

SYSTEM CONTEXT



THE EVOLUTION OF WASTE PREVENTION INITIATIVES: A UNEP PERSPECTIVE

by Fritz BALKAU
Production and Consumption Unit
UNEP, Division of Technology, Industry and Economics
Paris, France

PLENARY SESSION

From their first objective of simply preventing the release of pollutants to the environment, the various concepts we know under such titles as waste minimization, cleaner production, eco-efficiency and green productivity have all developed further. The initial aim of such programmes was to introduce cleaner technologies. They gradually saw the need to incorporate also the notion of improved environmental management systems, and a variety of eco-tools and instruments. There has been a growing emphasis on the entire life-cycle of processes and products, and addressing improved resource productivity in addition to pollution prevention. Eventually it was realised that consideration must go beyond dealing only with production processes; we now understand the importance of also making consumption patterns (both domestic and industrial) more sustainable.

Simultaneous with this wider vision of prevention programmes came the realization that the actors have changed. In remediation programmes environmental specialists were the key players. But 'prevention' actions occur earlier in the life-cycle of a process, and we now understand better the important role of persons in engineering, finance, marketing, and business management. These sectors have not in the past understood that they have an environmental role, and their formal education and training has not given them the awareness, knowledge or skills to contribute effectively to a cleaner production approach.

It is also clear that more attention has to be given to the linkages between stakeholders, as in many cases only a concerted action will be effective. Thus effective recycling schemes depend on complementary actions between many different actors from product design through to residue disposal, with the actual recycling operation being somewhere in the middle. The role of governments in providing an enabling policy framework for company action on eco-efficiency and cleaner production is also well known. There are also benefits from strong links within industry, as for example in implementing supply-chain management concepts and extended producer responsibility.

International institutions such as OECD and UNEP are now evolving their programmes to reflect this change in perspective.

For example, recent high-level meetings of UNEP's Cleaner Production programme recommended changes in orientation to maintain the relevance of the programme, to adapt to the evolving needs of countries, and to acknowledge the growing importance of voluntary initiatives. I want to briefly give an outline the changes we have made.

One example is the UNEP study of **financing mechanisms** for cleaner production to analyse past investment practice, see how lending policies of major banks reflect sustainable development principles, and identify mechanisms that favour rather than discourage cleaner production investments.

There has also been considerable work to promote and improve the use of various **environmental management tools** such as EIA, LCA EnTA and auditing. Much work has gone into benchmarking corporate tools such as environmental and social reporting, supply-chain management and green procurement. The systematic use of EMS has been promoted through the publication of a trainers kit, jointly with ICC and FIDIC. The concept of extended producer responsibility is a key element in this work.

UNEP has also commenced a series of activities to promote the concept of **sustainable consumption**. The activities are for the moment aimed at improving dialogue and consensus on the need for sustainable consumption, analysing the driving forces, and commencing to engage major stakeholders such as the advertising industry.

Associated with the sustainable consumption initiative are the activities on **product development** for sustainable development, on eco-design, and on green procurement.

In order to build commitment to such a broad range of initiatives also in companies and institutions, UNEP has prepared, after extensive consultation with key stakeholders, an **International Declaration on Cleaner Production.** Key individuals are invited to sign this Declaration to make public their commitment to the implementation of the prevention approach.

These activities continue to be supported by **traditional functions** of awareness-raising, compiling case studies, information exchange, training and capacity building. In a number of countries **National Cleaner Production Centres** ensure more effective delivery of these initiatives at the country level. Several centres have themselves catalyzed the establishment of further centres at the local level.

The evolution of the UNEP programme is similar to that found in other organizations, both at national and international levels. Taken together, the changes ensure that the implementation of the prevention principle keeps pace with the broader vision of sustainable development that is compatible also with the new CSD framework on ‘sustainable production and consumption’.

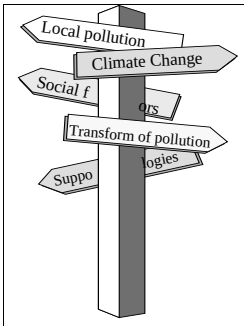
Given the scope of these changes, and their impact also on other policies of environmental, economic and social development, there is a great need to exchange experience and analyze the results. Forums such as this are essential if waste prevention programmes are to be better understood, and be actually implemented by governments and within the business sector.

POWERPOINT PRESENTATION [Fritz Balkau]

Global Perspectives on Assessing Technologies for Waste Prevention and Cleaner Production

F. Balkau and W. Zhao
For OECD Workshop on Extended Producer Responsibility
and Waste Minimization Policy
Paris, 4-7 May. 1999

UNEP May 1999



When we select technologies for waste prevention and cleaner production, how do we make the technology choice wisely?

UNEP May 1999

Example 1. Chrome use in leather tanning

Under the regulatory pressure on the content of Chrome in the wastewater, technologies for increasing the fixation levels of chrome in the tanning path are introduced. As a result, the concentration of chrome in effluent is reduced. But the remaining chrome is in compound form that are very difficult to treat.

UNEP May 1999

Example 2. Cyanide use in gold ores extraction

Cyanide is used conventionally in gold extraction and is under pressure to be phased-out due to its high toxicity. But it is easy to treat and the technology for treatment is well developed. The alternative technologies such as pressure oxidation and the bio-leach technique may be less toxic and non toxic but there are other factors prevent them from been applied.

UNEP May 1999

Example 3. Water-based drilling mud in oil exploration

Water-based drilling mud is recently preferred comparing with oil-based drilling mud. However, it results in a significant increase in energy consumption. One should balance the risk of local pollution and global impact of additional energy use.

UNEP May 1999

Example 4. New lead alloys for improving efficiency of car-batteries

New lead alloys for car-batteries improve efficiency and reduce the weight of the batteries. But they interfere with the metallurgical processes during recycling and make it difficult to reclaim the lead.

UNEP May 1999

Example 5. Forgotten aspect in semiconductor manufacture

The large amount of ultra-pure water is required by the semiconductor manufacturing. The treatment of the sludge produced by the ultra-pure water production is not part of the main process. But its environmental impact should not be overlooked.

UNEP May 1999

Environmental management tools

- Environmental Impact Assessment
- Cleaner Production Assessment
- Risk assessment
- Life-cycle Assessment
- Eco-design
- Environment Technology Assessment

UNEP May 1999

Needs for Environment Technology Assessment

- Single-criteria decision making often leads to transformation of the environmental problems rather then preventing them
- ad-hoc approach to technology selection can not ensure optimal results
- Social factors can not be neglected if the waste prevention technologies are to be effective

UNEP May 1999

Main Steps of EnTA Procedure

- Examine the reason for the proposed technology
- Description of the technology
- System alternatives
- Future state of society assumptions
- Stakeholders - Parties at interest

UNEP May 1999

Main Steps of EnTA Procedure (cont'd)

- Identification of potential impacts
- Identification of relevant decision-makers
- Public policy issues
- Conclusions and recommendations

UNEP May 1999

Features of EnTA Process

- Evaluation is applied equally to the problem technology and the alternatives
- examines also the supply-chain and infrastructure needs
- examines all environmental impacts, including social aspects
- displays the options in a comparative fashion

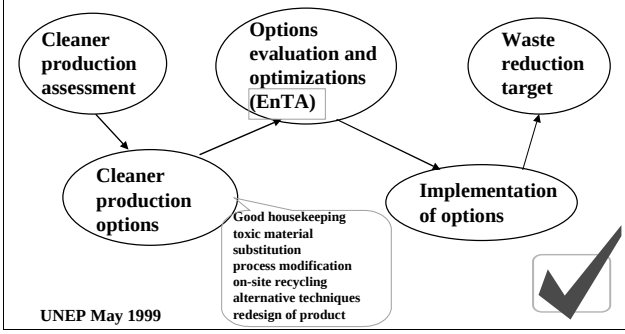
UNEP May 1999

UNEP's input in the development and application of EnTA

- Developed EnTA primer and workbook to documents the development and descriptions of this assessment tool
- To perfect the methodology of EnTA by applying it on technologies in certain sectors
- To integrate EnTA into the environmental management "tool box"

UNEP May 1999

EnTA application to waste prevention at company level



UNEP May 1999

EnTA application to waste prevention at government level

- Assisting the implementation of waste prevention programmes
- Integration of social factors in technology choice for waste prevention
- Development of policy framework for technology import which incorporate environmental considerations

UNEP May 1999

Conclusions

The use of formal environmental technology assessment methodology for waste prevention and treatment technologies can avoid decisions based only on limited number of the environmental criteria and optimize the result of the waste prevention efforts.

UNEP May 1999

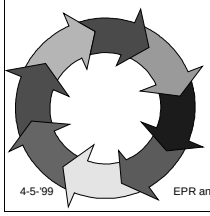
EPR AND GOAL SETTING IN DUTCH PACKAGING POLICY: A PERSONAL REFLECTION

Powerpoint Presentation by
Kees Clement
Ministry of Environment, The Netherlands

EPR SESSION: 3

EPR and goal setting in Dutch packaging policy

a personal reflection



Kees Clement
Ministry of Environment
The Netherlands

4-5-'99 EPR and goal setting in Dutch packaging policy 1

Background of this presentation

- **Workshop has three subjects:**
  - Analytical framework (the 'how')
  - Monitoring and reporting
  - Evaluation of Performance
- **This presentation is on the 'how' of applying EPR**
- **Some remarks and questions on formulating waste policy**
- **EPR and waste reduction**
- **Case of packaging policy the Netherlands**
- **Conclusions**

4-5-'99 EPR and goal setting in Dutch packaging policy 2

Dutch policy on the environment; the general approach

- **Decouple economic growth and environmental pollution**
- **There are three key resources that should be maintained:**
  - Space: quantity and quality
  - Bio-diversity
  - Energy
- **Diminishing use of key resources = diminishing environmental pressure**

4-5-'99 EPR and goal setting in Dutch packaging policy 3

Some ideas on a policy for waste reduction

- **main goal is to reach environmental protection and waste reduction**
- **waste reduction is useful in as far as this means diminishing the environmental pressure**
- **the target is to choose an optimum combination of prevention, reuse, recycling, recovery and dumping**
- **theoretically this can be measured by means of an Extended Life Cycle Analysis (ELCA) which implements energy, space as well as biodiversity**

4-5-'99 EPR and goal setting in Dutch packaging policy 4

Policy on waste reduction some questions

- shall problems in waste minimisation be considered in a broader context of the whole material chain and the three key variables?
- what does this mean for formulating absolute targets on reuse,recycling, recovery, dumping etc.?
- how do we calculate the new environmental pressure: how do we design a new life cycle analysis which contains energy, space as well as biodiversity?

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EPR and waste reduction

MainRule: Put responsibilities in the right place with as few rules as possible

EPR means:

- obligation to take initiatives and to perform action
- obligation to reach the targets
- maximum freedom to choose the instruments

4-5-'99 6

Main conditions for applying EPR

- ✔ Make a clear policy framework
- ✔ Be clear on targets and means
- ✔ Be clear on responsibilities
- ✔ Define the sticks and carrots
- ✔ Encourage competition
- ✔ Make the system waterproof:
  - individual obligations
  - adequate monitoring
  - checking compliance

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Dutch packaging policy

- choice between covenant and individual obligations put down in the law
- rules are applicable for all packaging
- producers (packagers/fillers) and importers (of packed goods) have main responsibility
- participation of the whole chain
- local authorities retain responsibility on collection
- no green-dot system; market rules

Targets of the packaging covenant

Targets on Prevention, Reuse, Recycling and Recovery should be considered more as interrelated to reach the environmental goal

this means that:

- within some limits on separate targets
- and with defining an environmental goal
- a system of 'communicating vessels' between prevention, reuse, recycling and recovery should be considered

The theoretical target of a packaging covenant

- a target formulated in terms of totally allowed burden of Environmental Pressure Units (EPUs) is the best
- EPUs in terms of a total burden on energy, space, as well as biodiversity has not yet been developed
- even an overall accepted LCA-approach with an overall accepted way of measuring and weighing of different aspects is not (yet) available
- but we should at least try to set a target which is the best approach, given this considerations

4-5-'99 EPR and goal setting in Dutch packaging policy 10

Result: the covenant has an overall environmental target

- the target of Dutch packaging policy is to diminish the amount of packaging waste to be dumped or incinerated (to 940 kiloton)
- the amount to be dumped or incinerated is an approach to minimise environmental pressure
- there is a free choice to reach this target by a mix of prevention, reuse, recycling or recovery within some limits

Limitations on the free mix for reaching the target

Free choice has three limits:
- Net prevention must be at least 10 %
- Recycling in average should be at least 65 %
- Reuse has to be maintained unless it is proven that one way packaging is better for the environment

Conclusions for an EPR framework

- targets on waste reduction should be formulated in the broader context of the whole lifecycle and as much as possible in terms of environmental pressure (EPUs) the sum of scarce factors: space, energy and biodiversity
- use an Extended Life Cycle Analysis (ELCA) for this
- in using EPR governments must be sure that the main conditions for applying EPR are fullfilled
- if the right targets are formulated and the main conditions are fulfilled , within some limits, maximum freedom for the individual producer can be given

AB ELECTROLUX VIEW TO EXTENDED PRODUCER RESPONSIBILITY FOR THE APPLIANCE INDUSTRY

by
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EPR SESSION: 3

Summary

Electrolux is one of the world's leading producers of household appliances for indoor and outdoor use, and of corresponding products for professional users.

In current policy-making, the product group "electric and electronic equipment" is defined as subject for EPR legislation, which include the majority of Electrolux products. On EU-level, working papers have been presented and a first draft directive is expected this spring. Some countries have presented, and in some cases finalized national EPR legislation for electric and electronic products. Examples are Japan, Norway and the Netherlands.

Electrolux is worried about the trend towards legislation that leads to non competitive pool systems, and thus creates no new incentives for companies to improve in terms of eco-design and system development.

More specifically, by giving manufacturers a non specific responsibility to take-back unspecified products corresponding to present market share, the possible incentives and dynamic mechanisms that EPR could represent, are not utilized.

Electrolux promotes a direct, future oriented EPR. This means that an obligation to take back the product is made at the point of sales and that this specific product. In this way the right incentives are created to improve recycling efficiency by product design and system development.

Electrolux and the appliance industry

Electrolux is one of the world's leading producers of household appliances for indoor and outdoor use, and of corresponding products for professional users. Every year, consumers in more than 100 countries buy more than 55 billion Group products. Electrolux is the European market leader in white goods, and is the third largest white goods company in the US. The Group is the world's largest producer of floor-care products, absorption refrigerators for caravans and hotel rooms, and compressors for refrigerators and freezers. Electrolux is also the largest or second largest company in the world for food service equipment, professional laundry equipment and forestry and garden equipment

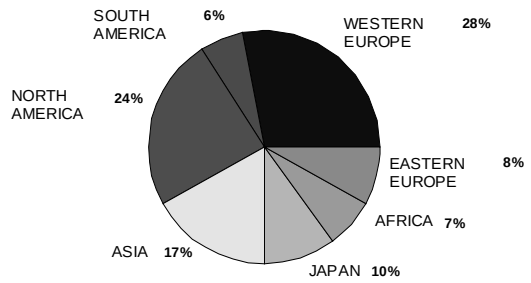

Fig 1: Global volumes of white goods per region (1995)

In 1995, the white goods market, in terms of world-wide sales, accounted for 220 million appliances, 62% of which were sold in Western Europe, North America and Japan.

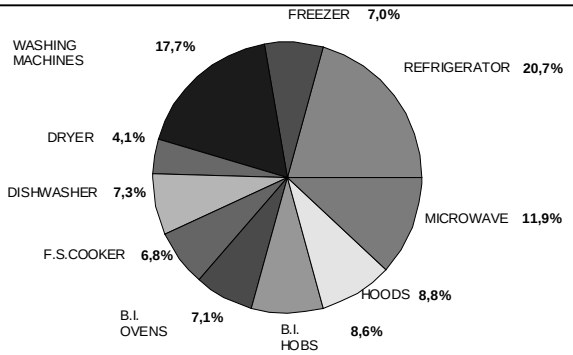

Fig 2: Volumes sold in Western Europe per product category (1995)

The white goods market is highly concentrated; 55% of the world market is controlled by five industrial groups: Electrolux, Whirlpool, Matsushita, General Electric and Bosch-Siemens. 90% of North American market is controlled by four industrial groups: Whirlpool, General Electric, Electrolux and Maytag. Further, 60% of European market is controlled by five industrial groups: Electrolux, Bosch-Siemens, Whirlpool, Merloni and Elfi and finally, 80% of the Japanese market is in the hands of five manufacturers: Matsushita, Toshiba, Hitachi, Sanyo and Sharp.

The OECD white goods market is saturated and fiercely competitive. This means that growth can be achieved only through the acquisition of competitors' market shares or by penetration of new markets.

The foundation for our environmental work - the life cycle approach

During the 90s, big companies have very much broadened perspective in environmental work. From a rather factory oriented view, environmental considerations are nowadays put on all life cycle phases of the products.

Together with the research community, big efforts have been made to develop and apply methodology to better understand the environmental impact of product systems. Results from Life

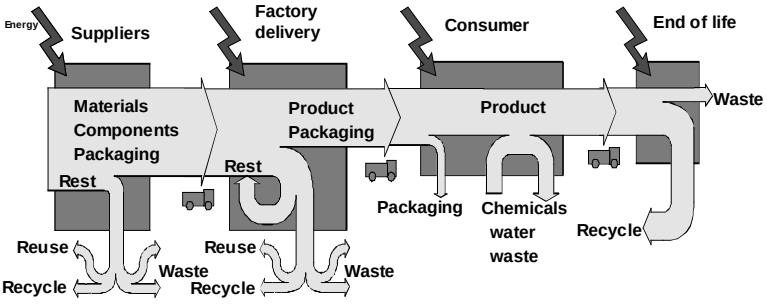

Fig 3: The product life cycle approach

Cycle Assessments, LCAs, and similar analyses have redirected attention and priorities.

One extremely interesting finding from our and others' studies of appliances, especially white goods, is that the usage phase of the product dominates the life cycle environmental impact. The indirect effects of the use of electricity, fuels, detergents and water are crucial when determining environmental changes and improvements in product and business development.

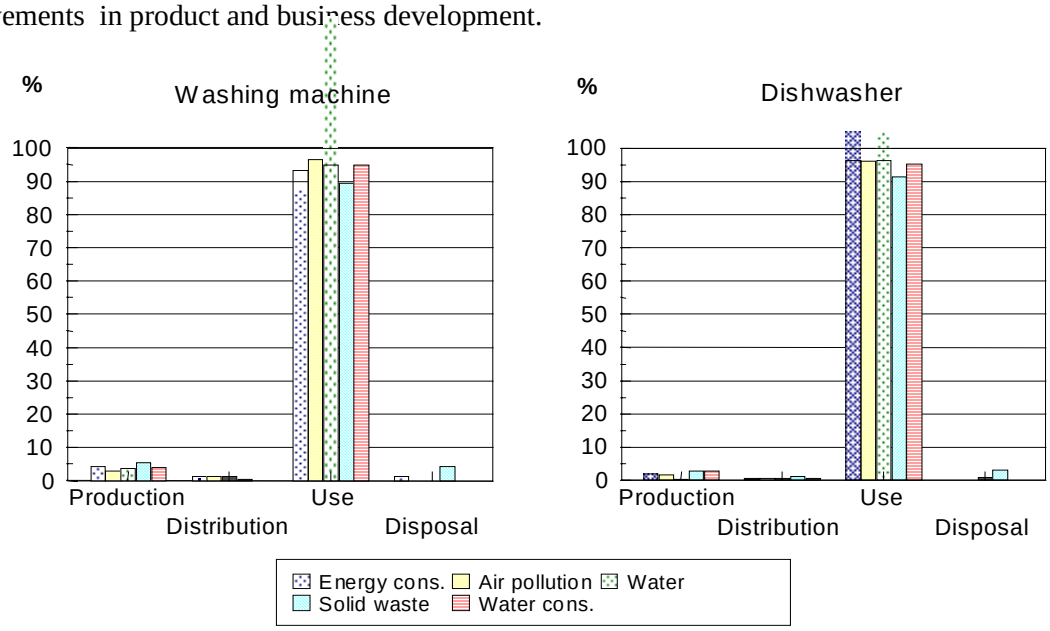

Fig 4: Life cycle assessments of white goods (source EU/PA-consulting)

Conclusion; all measures taken to improve the end of life treatment of products must be considered and evaluated from the life cycle perspective to achieve true environmental improvements.

Recycling trends in the appliance industry

The relatively high content of metals, especially steel, have made the recycling of appliances such as cookers, refrigerators and washing machines interesting from a pure material value point of view. A functioning infrastructure has been created in most OECD countries to handle steel scrap from cars, construction industry and production scrap. This is also used to handle discarded appliances. The recycling rates are for appliances are normally in the range of 40-70% by weight. Landfill bans in many US states also enhance the recycling rates.

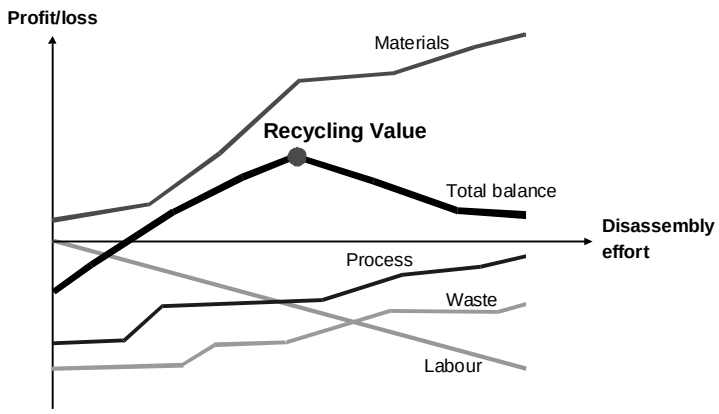

Fig 5: Recycling value: a model for optimizing the recyling economics

One important exemption in some countries are refrigerators and freezers. Due to the content of ozone depleting CFCs in products manufactured before 1996, some countries in Europe have introduced

mandatory recovery of CFCs when recycling. Appropriate processes have been developed and are now in use in e.g. Switzerland, the Netherlands, Germany and Sweden.

Considering the material composition of appliances, the primary route in recycling is and will remain material recycling. Metal, glass and thermoplastics completely dominate the material content. More problematic fractions such as electronics represent only a few percent of the total weight of appliances and many hazardous materials, such as CFCs, heavy metals etc are successfully being phased out.

Electrolux considers the recycling economy as guide in design for recycling. The recycling properties are determined in terms of cost and incomes when the products enters the recycling phase (Figure 5). By optimization of the recycling value of the products in this way, they become more attractive to the recyclers. Hence, an appropriate treatment and high recycling rate is stimulated.

Conclusion: Major appliances are fairly attractive for recycling and the recycling economics is an important parameter to address in product and system development to improve waste management procedures.

EPR and trends in policy-making

Obviously, EU and several nations within OECD are applying the producer responsibility concept when creating future waste policy. After having introduced policies for more commodity like waste streams such as packaging, batteries etc, more complex products such as cars and electric and electronic products are now being addressed.

The product group electric and electronic equipment is defined as a subject for EPR legislation. Most of Electrolux product categories are included by this definition, but also brown goods (radio, TV), IT, communication and office equipment. On EU-level, working papers have been presented and a first draft directive is expected this spring. Some countries have presented, and in some cases finalized national EPR legislation for electric and electronic products. Japan, Norway and the Netherlands are examples.

From the appliance business perspective, there is a risk in having this broad definition and thus applying the same specific policy components to all product categories. The differences in physical size, lifetime and end of life properties between product groups as well as the way they are sold and handled, the structure of the respective retail and manufacturers business may motivate different solutions when implementing an EPR policy.

These variations in business environment within the electric and electronic products might be a reason why difficulties have been experienced to find a unanimous and clear position in this issue and this is actually the situation for certain components of EPR policies proposed in Europe, and what Electrolux promotes is not shared by all.

Present EPR policy trends

When analyzing the possible effect of proposed or finalized EPR-directives and ordinances, Electrolux has identified the formulation of the financial responsibility in an EPR as crucial. Unfortunately a worrying trend is observed:

No link between products and producers: the take back obligation is not linked to the producer of the specific products. Rather a generation type of responsibility is applied, i.e. the products brought to the market are used to finance the take back and recycling of old products of previous generation. In other

words, if you sell a product you have to take one old back, regardless of whether you originally produced it or not. This principle creates no new incentives for competition in eco-design and investments in products and production systems.

The most likely result of this principle is a common national industry administration where all producers selling products in practice have to contribute with fixed fees according to market shares. There is no incentive to improve products, costs related to poor product development are shared by all. At the end of the day the consumer pays an averaged fixed waste fee to the industry administration (instead of to the municipality as before EPR was introduced).

There are several reasons to the present development towards the EPR-polices in practice defining a collective, retroactive responsibility shared by all producers, instead of a direct, future oriented responsibility:

- Perceived difficulties to track the original producer once the product returns from the market.
- A political intention to include also the so called historical scrap, i.e. products sold before the date of effect of the EPR policy.
- Difficulties to determine and guarantee the financial liabilities of a future system.

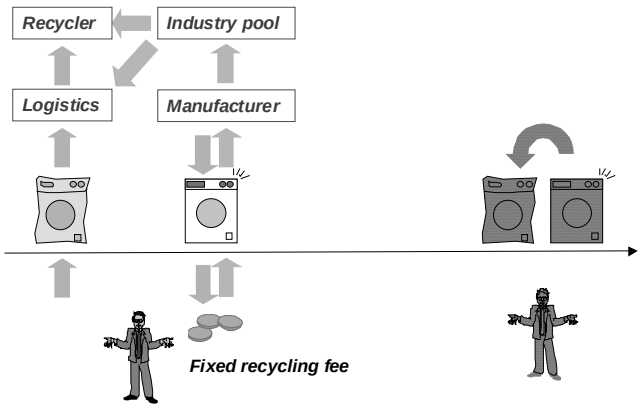

Fig 6: Payment flows for a generation solution to EPR, new products finances the old products.

However, Electrolux sees solutions to these is questions and is therefore proposing a different model for EPR aiming for dynamic, market driven solutions.

Electrolux view of EPR

Electrolux approach to EPR is that if introduced, EPR should fulfill two criteria:

Stimulate market driven solutions - to create incentives to producers improving the products and the business systems in terms of end-of-life procedures, i.e. use the market mechanisms to create self improving systems. As soon as these incentives are lost, the attractiveness of EPR as waste management policy disappears. Only by creating a direct link between the products' waste management and their producer, these incentives are created.

Flexibility - any legislation must allow alternative routes to fulfill the responsibility. In some situations, individual solutions with key retailers or key account customers might be the preferred choice, in other cases common administrations and industry coordinated solutions are better. The characteristics of the product category also determines what solution is developed. Any legislation must open up for alternatives. There is no single perfect system that can be predicted by legislation. The solutions must evolve over the years to come.

To achieve the dynamic and market driven solutions to EPR for appliances, any legal framework should have the following characteristics:

- A direct, future oriented responsibility making each manufacturer responsible for the products put to the market after entry into force of the EPR.
- Allowing manufacturers and other involved actors to co-operate when they find this beneficial and efficient.
- Book-keeping and taxation rules that opens for the necessary internal reservations or accruals necessary, or external solutions.
- Keep the historic waste separated. Use existing infrastructure or seek transitional solutions.

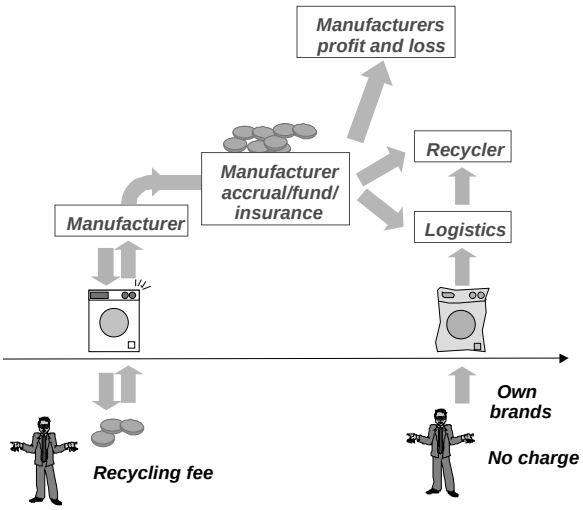

Fig 7: Payment flows for a future oriented direct producer responsibility.

Electrolux sees these principles as a starting point for EPR regardless of product group. Electrolux recognizes that there are product groups and material categories in the waste stream where the collective solution is the only reasonable. Whenever suitable these might be created, but it is on the conditions of the manufacturers and in competition with other options and alternatives.

The difficulties mentioned in previous section to implement future oriented and individual responsibility are challenging, however, they can be solved.

- The financing for the future is possible within the account principles establish today. Accruals, reservations with bank guarantee, insurance or third party foundations are some instruments to be used. The regular financial audits would be important control mechanisms.
- Tracking products continuously become easier. Modern IT technology allows quick and efficient registration and identification, when needed.
- Basically, retroactive responsibility is wrong. Historical products can often be taken care of with help of existing systems or transition solutions, and should not disturb the mechanisms of a true, future oriented producers responsibility.

To summarize, Electrolux would prefer:

- Future oriented, direct producer responsibility.
- Cooperation and pools are created when feasible.
- Historic waste not included, dealt with by transition solutions.

In this way self-balancing and self-improving efficient systems will be created.

POLICY OPTIONS FOR EPR TAKE-BACK PROGRAMS
and
CHECKLIST OF POLICY OPTIONS FOR TAKE-BACK PROGRAMS

by

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INFORM Inc., New York, United States

EPR SESSION: 3

As EPR programs proliferate around the world, it is clear that they share some common characteristics but that there are also significant differences among them. One common characteristic of most of the programs is some form of product/package take-back by industry. Or, put another way, some internalization of waste management costs by producers.

The purpose of the following checklist is to summarize the policy options for these take-back programs. Such a checklist can serve three purposes:

1. As a guide for policy makers when they are designing programs to assure all major policy options have been considered.

2. In matrix form, to facilitate comparisons among EPR programs for a given product/package sector in different countries and for different product/package sectors within a specific country.

3. As a guide for future research on the costs and benefits of EPR

It would be helpful if the OECD could include a policy checklist in the EPR Guidance Manual it is preparing. Voluntary harmonization of the format for describing programs and of definitions can facilitate comparisons of programs. Harmonization of definitions and reporting requirements, when possible, can also simplify and reduce the costs of compliance by multinational companies.

This checklist is not intended to be definitive but rather can serve as a first step in preparing such a document. Stakeholders need to have an opportunity to comment on such a list and to suggest additions or changes based on their experience with EPR.

A Guide for Policy-makers

The presence of an item on this list does not imply that the policy needs to be or even ought to be included in every EPR take-back program. For example, bans are on the list but many EPR programs may not include any bans. The purpose of the list is to be as inclusive as possible so major policy options are not overlooked.

This concise list could be expanded for use by policy-makers, describing the options in much greater detail, listing pros and cons of specific options and providing warnings of pitfalls to be avoided.

The German Green Dot program, the pioneer take-back program, experienced some serious difficulties in its early years, in part because there were no models to learn from. Items on the checklist can help program designers avoid such problems. Examples of this are regulations for phasing in a program and for enforcement. If the intent is to phase in collections there needs to be a mechanism to control the phase-in. The German system was overwhelmed in the early years by collections greatly in excess of what was planned because there was no way to control the amounts collected. If the intent is to collect 20 per cent of a given material, policy makers may want to limit initial collections to some geographical areas. Inadequate enforcement also posed major problems in Germany. Prior to instituting auditing, fines, and a withholding system, 90 per cent of the packages on the market carried a green dot but fees were paid for only 60 per cent of the packages.

The checklist can serve as a reminder of the importance of defining terms. Setting targets for recycling can be meaningless without a clear definition of recycling - identifying which processes can count toward the targets. While the material composition of packages may seem obvious, existing EPR programs demonstrate that they are not - paper packages coated with plastic are defined differently by different EPR programs and this can affect the fees they are subject to. The need to define products is also increasing. As consumers begin to access the internet through TVs and telephones, distinctions between these products and computers will become increasingly blurred. This will have to be clarified particularly when there are fee differentials among the products. Definitions of automotive products also require clear definitions -clearly distinguishing between cars and trucks. Compliance with EPR programs could be greatly facilitated and costs substantially reduced if material and product definitions were harmonized among OECD member states.

An EPR comparison matrix

It is very important to have a concise format for comparing EPR programs. This can help policy-makers in designing new programs and it is critical to evaluating existing programs and understanding costs and benefits. The costs of EPR programs have often been evaluated by comparing green dot fees. This can be extremely misleading as in some countries (i.e. Germany) the fees cover total costs of the system whereas in others (i.e. France) the fees cover only incremental costs of recycling over traditional disposal.

The following matrix by presenting a “snapshot” comparison of programs can lend more meaning to any comparison of fees, costs or environmental benefits. For example, it would enable the analyst to understand which entity is responsible for which costs, and whether the programs being compared have similar scope or similar targets—items that have major impact on program costs and benefits.

A guide for future research projects

To date, the analysis of the costs of EPR programs has been focused on operational factors - the costs of collection, sorting, recycling. In fact, the costs of EPR programs are determined to a large extent by the choices of policy options. For example, the level of mandated recycling rates and the decisions on what counts as recycling clearly have an impact on the costs of a program. These items also have an impact on the benefits of the program. Determining operational costs is quite straightforward compared to estimating costs related to policy options. Nevertheless, the checklist can be used to begin research on the link between the specific policy options and both costs and benefits.

Policy options other than take-back

Since the checklist only relates to take-back programs, a similar checklist can be created for EPR related programs that do not include take-back. These include tax/subsidy programs, advanced disposal fees, and other mechanisms through which industry contributes to the costs of waste management systems.

EPR cost matrix

Other sessions will focus on the detailed costs of EPR programs. A simple cost matrix is presented here as it follows from the policy checklist. It is essential that an EPR cost matrix include government costs, industry costs, direct consumer costs and total costs. The consumer costs refer to those paid directly such as the fees that will be paid by end-users for appliance take-back in Japan. It is assumed that industry costs may be passed on to consumers in higher prices, and that government costs are paid by taxpayers but these would not appear as direct consumer costs.

It is important to have separate documentation of waste management costs in order to compare EPR programs with each other and with other types of waste management programs. These costs can be used along with performance data to calculate cost per ton recycled. It would be helpful to have these costs reported separately by material or by product. Other costs related to EPR, such as those for reporting, enforcement and education can be included in the matrix but should be disaggregated from the waste management costs of the program.

The OECD has a window of opportunity with respect to reporting of EPR costs. EPR programs are relatively new and not much reporting has been done to date. Once programs develop their own reporting formats it will be very difficult to get them to change. If the OECD develops a format now, harmonization may be possible. This will greatly facilitate analysis of EPR costs in the future.

Need for harmonization

This paper has made numerous references to the need for harmonization of both definitions and reporting requirements. There may be instances where harmonization is not achievable - for example, in the definition of recycling. A solution to this is sufficient disaggregation of data. In the case of recycling of plastic packaging, if there is disaggregated data on the different processes such as mechanical, feedstock, waste-to-energy, then programs can be compared even if the definition of recycling is not harmonized. On the other hand, if data is aggregated and only total plastic recycling is reported, comparisons become hopeless if different definitions of recycling are being used.

One of the obstacles to harmonization is that definitions of terms such as waste and recycling have become very politicized. The OECD can be helpful in developing politically neutral terminology and data on materials flows that enables member states to communicate clearly on policy issues and to learn from effective comparisons of existing EPR programs.

CHECKLIST OF POLICY OPTIONS FOR TAKE-BACK PROGRAMS

Scope of coverage

by type of product/package (i.e. white goods vs. all electric/electronic);
by generator (i.e. residential, commercial, institutional);
by geography (i.e. entire country vs targeted areas).

Timeframe (phase-in)

date of legislation or agreement;
date of program initiation;
date of full implementation;
regulations for phase-in.

Mandatory/ Negotiated/Voluntary

Internalization of Waste Management Costs

costs shifted from government to industry (total or partial);
costs shifted by operation;
- collection;
- sorting;
- reuse, repair, remanufacture, recycling.

Operations

Use existing infrastructure (i.e. collection, sorting, recycling).

Responsible Entity (i.e. brand name, manufacturer, retailer, product chain)

take back own product;
third party take-back (PRO).

Take-back Fees

entity setting fees;
entity receiving fees;
fee basis (i.e. unit, material, weight, volume, other);
fee level;

by material	or	by product
paper		computers
glass		t.v.s
metals		refrigerators
plastics		washing machines
composites		air-conditioners

point of fee payment (i.e. when introduced, purchase, return by end user)

Targets-rates and dates (i.e. reduction, recycling, recovery, collection)

by material	or	by product
paper		computers
glass		t.v.s
metals		refrigerators
plastics		washing machines
composites		air-conditioners

Definitions

materials (i.e. how define package 80% paper, 20% plastic?)
products
recycling (i.e. mechanical only, feedstock, W-T-E?)

Reporting Requirements (i.e. waste generation, recycling, recovery, recycled content, costs)

Other Requirements

Bans
  Of materials from products
  Of materials/products from municipal waste
  Of materials/products from landfill
Refill rates
Labelling
Deposits
Import/Export
Return by end user
Mandated free take-back
Access to collection points
Exemptions (i.e. health/safety, revenue)

Enforcement

Responsible entity
Penalties
Recycling documentation/accreditation
Free riders

Sector Specific Issues-long lived products

Orphan products
Existing vs. new products
Certificate of deregistration/recycling

EPR COMPARISON MATRIX **Sector: Packaging**

Program Characteristics	Japan	U.K.	Germany
Scope of Coverage by type of product/package (i.e. white goods vs. all electric/electronic) by generator (i.e. residential, commercial, institutional)			
Timeframe (phase-in) date of legislation, regulation or agreement date of program initiation date of full implementation			
Mandatory/ Negotiated/Voluntary			
Internalization of Waste Management Costs costs shifted from government to industry (total or partial) costs shifted by operation (%) collection sorting reuse, repair, remanufacture, recycling			
Operations Use existing infrastructure (i.e. collection, sorting, recycling)			
Responsible Entity (i.e. brand name, manufacturer, retailer, product chain) take back own product third party take-back (PRO)			
Take-back Fees entity setting fees entity receiving fees fee basis (i.e. unit, material, weight, volume, other) fee level by material or by product paper computers glass t.v.s metals refrigerators plastics washing machines composites air-conditioners			
Point of fee payment (i.e. when introduced, purchase, return by end user)			

EPR COMPARISON MATRIX **Sector: Packaging**

Targets-rates and dates (i.e. reduction, recycling, recovery, collection) by material or by product paper computers glass t.v.s metals refrigerators plastics washing machines composites air-conditioners			
Technologies recycling (i.e. mechanical only, feedstock, W-T-E?) recovery (I.e. W-T-E)			
Reporting Requirements (i.e. waste generation, recycling, recovery, recycled content, costs)			
Other Requirements Bans Of materials from products Of materials/products from municipal waste Of materials/products from landfill Refill rates Labelling Deposits Import/Export Return by end user Mandated free take-back Access to collection points Exemptions (i.e. health/safety, sales revenue)			
Enforcement Responsible entity Penalties Recycling documentation/accreditation Free riders			
Sector Specific Issues-long lived products Orphan products Existing vs. new products Certificate of deregistration/recycling			

EPR COST MATRIX
Program: Packaging, UK

Costs	Government	Industry	Direct Consumer	Total
Collection Sorting Recycling **Total waste management costs**				
Reporting Enforcement Education etc. **Total other costs**				

Tons recycled: _____

Waste management costs per ton: _____

APPLICATION MATRIX FOR EXTENDED PRODUCER RESPONSIBILITY PROGRAMS

Powerpoint Presentation by
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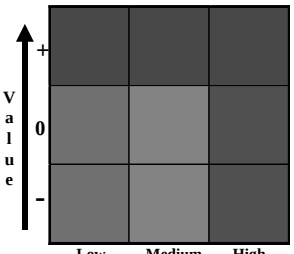
EPR SESSION: 3

Application Matrix

For Extended Producer Responsibility Programs

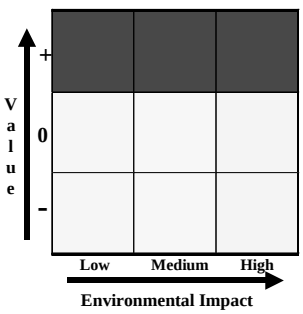
Michael Bennett
Envineering™ Australia Pty Ltd

Application of EPR Key Criteria



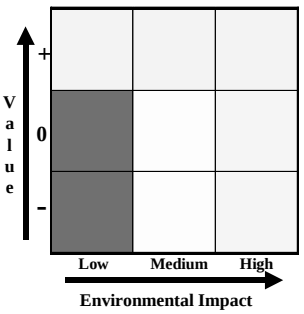
- Value
  - Cost of recovery / recycling / disposal compared to revenue from recovered components
  - Will vary depending on market and country dynamics
- Impact
  - Specific hazards and impacts need to be assessed
  - Magnitude of hazards and impacts will vary due to country and socio-geographic dynamics

Market Driven Programs
Positive value -- Post Consumer Phase



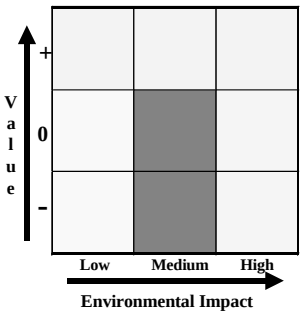
- Market forces will generate programs where positive value exists
- The greater the value the higher the likelihood of development
- Intervention by governments carefully considered to prevent monopolistic practises and other market distortions
- Intervention may be required where the size of the market prohibits profitable operations for high impact materials

Voluntary Programs
Negative value -- Low Impact



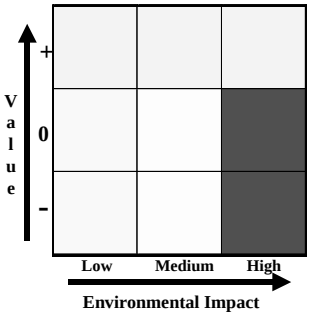
- Intervention by governments not required
- Programs will be established due to corporate responsibility policies and for marketing purposes
- Potential for product differentiation and competitive advantage
- Success of programs will be dependent on consumer commitment

Negotiated Programs
Negative Value -- Medium Impact



- Hazard/impact warrants focus
- Industry may not be capable of effectively establishing and maintaining a voluntary program
- Intervention through outcome oriented legislative support may be required
- Broad supportive framework to ensure participation by all actors
- Enforcement is critical
- National consistency is critical

Mandatory Programs
Negative Value -- High Impact



- Hazard/impact such that safe disposal/recycling is essential
- Emphasis on outcome oriented legislation but likely to be more prescriptive
- Environmental/disposal costs may be displayed in pricing to assist with consumer awareness and decision making
- Enforcement critical
- National consistency critical

Government Intervention
Intervention has Responsibilities

- Once governments become involved they must fulfil certain responsibilities
- Activities may be delegated or contracted but ultimate responsibility remains
- Enforcement
- Monitoring
- Potential for start-up financial assistance
- Potential of financial support for orphan products

TWO IMPORTANT ASPECTS TO BE CLARIFIED ON THE EPR DISCUSSION AT OECD

by
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EPR SESSION: 3

The author of this paper[1] thinks that there are several points to be clarified before OECD completes its discussion on Extended Producer Responsibility (EPR). In this paper two important aspects are picked up. They are; 1) comparative study on cost internalization into the product price vs. consumer-pay-at-discharge scheme, and 2) relationship between EPR and the Polluter Pays Principle (PPP).

1. Cost Internalization vs. Consumer-Pay-at-Discharge Scheme

The OECD[1998a] indicates that the producer should bear the responsibility for waste treatment, and further, these costs will not be paid by the consumers at the discharge stage, but should be internalized into the products price at the time of sales. The report cites the Packaging Waste Ordinances in France and Germany as examples. The reasons for the OECD view are that cost internalization would be simpler administratively (therefore the cost being low), and that the payment by the consumer at time of discharge induces illegal dumping[2].

In the development of the discussions above, the OECD assumes that the final burden will be levied 100% on the consumers, even if cost is internalized into the prices of the products[3]. Let us examine this point from an economic point of view (the following discussion owes greatly to *Hosoda E.* [1999]). The conclusions are:

1. The internalized cost will be shared by <u>both</u> the producers and the consumers, provided that portion will depend on the price elasticity of supply and demand.

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2 It states, "to assess the fee at the point of original sale is administratively the most simple and effective way." and, "To impose a separate fee a the time of disposal, as some producers have urged, may provide an incentive to consumers to engage in fee evasion." OECD [1998a], page 25. Furthermore, it could be gathered from this statement that producers in every country assert the consumer-pay-at-discharge scheme.

3 Regardless of whether cost is internalized in the price or the conventional treatment by local governments, it states that "it is inescapable that costs are always passed on or back to the consumer/taxpayer, who inevitably pays for waste management." (OECD [1998a], p. 29).

2. Regardless of the scheme (whether cost is internalized into the product price or consumers pay at the discharge stage), the net burden will be borne by both the producer and the consumer, and moreover, the portion of burden between the producer and the consumer in both cases are the same.

1.1 The Cost Burdening to Producers and Consumers in the case of cost internalization

First, I would like to explain point 1) above. (Please refer to Figure 1). With regard to a product, let us suppose that equilibrium is attained at the intersection of the demand curve (straight line) *D* and the supply curve (straight line) *S*, i.e. Price *p** and Quantity *q**. In this case, the consumer surplus would be p_1ap^*, and the producer surplus would be p_2ap^*. Next, let us suppose that EPR has been introduced, and that the waste treatment cost has been internalized into the product price (in this paper term "treatment" includes collection, transportation, sorting, recycling, incineration and final disposal of wastes). If the price is increased by *bc*, the supply curve shifts to *S'*, and the demand becomes equal at point *b*. The price would be *p'*, and the quantity would be *q'*. In this case, the consumer surplus would be p_1bp', and the producer surplus would be $p'bp_0$. Angles of $p_0p'b$ and $p_0p''c$ are both right-angled, angles of $p'bp_0$ and $p''cp_2$ are equal, and since straight-line $p'b = p''c$, triangles $p'bp_0$ and $p''cp_2$ are congruent. From the above, the reduction portion of the consumer surplus would be $p'bap^*$, and the reduction portion of the producer surplus would be p^*acp''. These areas show net burdens by the producer and the consumer as a result of internalizing the cost into the price (strictly speaking, the consumer burden would be rectangle p^*dbp', and the producer burden would be p^*dcp'', and the area of triangle *abc* is called as dead weight loss. However, we will not go into detail here). By studying the figure, you can tell that the net burden of the producer and the consumer are almost equal. This ratio would change depending on the price elasticity of the supply and demand. Please refer now to Figure 2. The only difference with Figure 1 is that the price elasticity of demand is smaller. In Figure 2, both the producer and the consumer assume burden, however, the consumer's burden is much bigger. As to price elasticity of supply, similar fashion will be applied. From the above, the following can be introduced. That is, if the market is perfect:

> The smaller the price elasticity of demand is, the greater is the increase in the ratio of the waste treatment burden shifting to the consumer. Contrary-wise, the larger the price elasticity of demand, the greater is the increase in the ratio shifted to the producer.
>
> The smaller the price elasticity of supply is, the bigger becomes producer's burden. On the other hand, the larger the price elasticity of supply is, the easier it is to shift the burden to consumer.

1.2 Cost Internalization vs. Consumer-Pay-at-Discharge Scheme

Next, let us consider the case in which the consumer pays the waste treatment costs at the time of discharge. Please refer to Figure 3. This figure is a copy of Figure 1, striking off *S'* and newly adding demand curve (straight line) *D'*. Figure 3 assumes that the consumer pays the waste treatment costs at the time of discharge. Though it depends on the length of the time lag between the purchasing point and the discharge point, if it is supposed that the time lag is short, to pay treatment fees at time of discharge will mean the same, for consumer, as a rise in product prices equivalent to the treatment cost portion. Therefore, the demand curve will shift down. It will shift down in the same height of *S* and *S'* in Figure 1 (this is because the increased price, *bc*, in Figure 1, and the discharge fee for consumer, *bc*, in Figure 3 are equal to one another). In this case, the equilibrium point moves from *a* to *c*, and the price and the quantity become *p''* and *q'* respectively. The reduction portion of the consumer surplus is triangle $p_1ap^* - p_2cp''$,

the reduction portion of the producer surplus is $p^*ap_3 - p''cp_3 = p^*acp''$, and this equals the reduction portion of the producer surplus in Figure 1. Next, due to the same reasoning as in 1.1, triangles p_1bp' and p_2cp'' are congruent. Therefore, the reduction portion of the consumer surplus, $p_1ap^* - p_2cp''$ would be equal to trapezoid $p'bap^*$, and this would be equal to the reduction portion of the consumer surplus in Figure 1. From the above, the following can be said:

> *If the time lag between the purchasing and the discharge period is short, even if the scheme is different (either to internalize the waste treatment costs to the product price, or to have consumer pay at the time of discharge), net burden by the producer or the consumer remain unchanged.*

In the case where the time lag is long, as in durable consumer goods, situation may varies depending to what extent consumer, at the time of purchase, take into consideration of the discharge fees they will have to pay at time of discharge. If the consumer does not pay attention to the discharge fees very much, the demand curve will not shift downward that much, and will only be between *D* and *D'* (the case will depend on whether the discharge fees are announced in advance, and whether or not there are elements of uncertainty). In this case, the reduction portion of both the producer and the consumer surpluses will be smaller than that of cost internalization scheme. This will mean that, for both the producer and the consumer, the consumer payment at the time of discharge would be easier to accept. However, the opposite may also be possible. In other words, there could be a case in which the consumer will face higher discharge fees than what they anticipated. However, if the discharge fees actually become lower due to rapid technological innovation, the payment amount at the time of discharge may well be at a level that the consumers anticipated. From a policy point of view, this holds an important meaning.

One of the focuses in Japan's EPR discussions is whether or not to internalize treatment costs to the product prices. Some producers oppose this, because, under the cost internalization scheme, the price hike would be difficult due to keen competition, and as a result, the producers will eventually bear the cost. However, under these circumstances, the result would be the same even if the payment obligations were borne by the consumers at the time of discharge. Let me explain using a figure again. Please refer to Figure 4.

Figure 4 describes the case where the elasticity of demand is extremely high. In this situation, a small rise in prices would greatly reduce the demand. The assertion by the producers mentioned above that a price hike would be difficult point to this situation. In these situations, when the *bc* portion of the waste treatment costs are added to the product price, the supply curve shifts from *S* to *S'*, and along with it, the price rises to *p'* and the sales quantity drops to *q'*. In this case, the reduction portion of the producer surplus is p^*acp'' and the reduction portion of the consumer surplus is $p'bap^*$. In other words, the larger the price elasticity of the demand is, higher the ratio of the reduction portion of the producer surplus will become, however, the burden of the price hike (although the ratio is small) will also be borne by the consumer. What will happen if it is a scheme where the consumer pays the treatment costs at the time of discharge as some producers in the same market try to assert? There would be no difference in the results. Please refer to Figure 4 again. In this case, if the time lag is short, the demand curve will shift to *D'*, and the price and the sales quantity will drop to *p''* and *q'* respectively. Explanations have already been made in the comparison of Figure 1 and Figure 3. Namely, reduction portion of the producer and the consumer surplus is the same as in the case of cost internalization. In other words, in a situation where a price hike is difficult (situation where the demand curve is close to horizontal), even if the consumer pays at the time of discharge, the demand will drop sharply, and the producer's position will not differ from the case of a price add-on. This would be the case theoretically and may apply in the case of packaging waste. In reality, however, this may not be the case due to the existence of time lag. For durable consumer goods such as home appliances, it will take a long period of time between the purchase and the discharge. As mentioned earlier, under the consumer paying scheme, the demand curve will not shift downward to the extent of *D'*,

but most probably stop somewhere between *D* and *D'*. If technological innovation progresses, as also mentioned earlier, this will be beneficial since the reduction ratio of both the producer and the consumer surpluses will become smaller. From the above, careful attention should be paid to the level of the shift in the demand curve. It will be affected by those factors as the characteristic of the product, dissemination of information on the discharge fees, and the outlook on technical innovations.

There are other elements in which consideration will have to be made regarding whether or not to internalize the cost. As mentioned earlier, the reasons that the OECD asserts the cost internalization scheme are because it is administratively easy and low-cost, and that consumer-pay-at-discharge scheme would induce illegal dumping. Japan's Recycling Law of Specified Home Appliances that will take effect in 2001 has adopted the consumer-pay-at-discharge scheme (consumers would pay total amount of the cost needed for recycling and the cost of collection and transportation to the retailers at the time of discharge). From the viewpoint that the treatment cost at the time of discharge cannot be decided in advance regarding durable consumer goods, and that as the operation of a deposit system would be costly, this can be considered as an appropriate choice. However, taking into consideration that the recycling costs differ in every home appliance manufacturer, and further, the collection and transportation costs differ by location, the operation of this scheme will probably be quite costly. Impressions from the OECD's EPR Workshops were that especially in Europe, illegal dumping and free-riders are major issues. Japan, through experience, will have to ascertain if that will also be the case in its own country. On the other hand, as a benefit of the consumer-pay-at-discharge scheme, by providing incentives to purchase environmentally friendly products and restraining waste by having consumers be aware of the waste discharge cost, an educational effect can be expected.

The issue on the scheme itself, on whether to internalize the cost into product prices or have the consumers pay at the time of discharge, should be decided after a thorough consideration of elements such as the theory, the characteristics of the concerned products, the domestic situation, the possibility of illegal dumping and the political feasibility.

1.3 Issue on Scheme Designing

The discussion so far is based on the assumption that the waste treatment cost is already widely known. This may not be the case with the deposit system. However, even in this case, it is necessary to know the accurate amount at the time of settlement. Moreover, in the case of the consumer-pay-at-discharge scheme, the treatment cost must be clear at that time. There is an interesting study paying attention to these points.

In *Hosoda E.* [1998], it examines from a theoretical aspect the following four systems, and proves that the results from them are all the same: cost internalization, consumer-pay-at-discharge, putting the responsibility of waste treatment on the producer and leave what to do to corporations' initiatives, and, to levy an income tax and use it as a subsidy for waste treatment and environmentally-friendly products. As a result, since all systems, except the method entrusting it to the market, involve enormous information costs (to know an accurate waste treatment cost is difficult), Hosoda concludes that the best choice is to leave it to the market (corporations' initiatives). This study has many hints and suggestions in regard to policy implications.

2. PPP and EPR (Is the Producer the Polluter?)

In the discussion at *OECD*, it seems that the grounds of transferring the responsibility of waste treatment from the local government to the producer are based on Polluter Pays Principle (PPP) [4]. The word "PPP", the author believes, is being used in the same meaning as the one appeared in the OECD "Guiding Principle concerning International Economic Aspects of Environmental Policies" adopted in 1972[5]. The concept of PPP was introduced with the view to internalize cost of pollution prevention (external diseconomies) in order to assure fair international competition. This principle states that the polluter (the source of external diseconomies) pays the pollution prevention cost. As an example, let us suppose that corporations of the same business in competition exist in country A and country B, and in both countries, the pollution regulations have been reinforced. In country A, the corporation bears the cost of pollution, and in country B, it is covered by a subsidy from the government. This will lead to a disadvantage in international competitiveness for the corporation in country A. So as to avoid such disadvantages, the "Polluter Pays Principle" was introduced, having the corporation in country B (the polluter) also pay the costs involved. The important point here is that it is always the "polluter" that pays.

Coming back to EPR, the OECD [1998a] describes the shifting of responsibility to the producer, on the grounds of PPP, as the essence of EPR. However, this is the same as describing the producer as "polluter". Is the producer actually the polluter? The introduction of EPR thinking in the general waste field started from packaging and extended to home appliances, and is now at the stage of influencing electronic equipment. Indeed, packaging is manufactured (or used for their own product) by the corporations. However, it is the consumers that ask for them. As an example, the minimal effect when department stores call upon the usage of plain wrappings during the holiday gift season is an issue on the consumer's side. In the case of home appliances, it is the consumer who enjoys utility by purchasing and using those goods. In economic terms, producer surplus and consumer surplus are accrued in accordance with the market price of the products, therefore, by the sales and purchasing of the product concerned, both the producer and the consumer gain benefit. This means that the producer and the consumer stand on equal ground, and does not lead to the idea that producers are polluters. Moreover, it is not true that all wastes pollute the environment. Therefore, to describe the producer as the polluter is itself a false claim. If used anyway, it will cause repulsion of the producers, and result in increasing political uncertainty in introducing EPR policy. If co-operation from the producers is to be obtained, PPP should rather be considered separately from EPR.

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4 As in, "Many OECD countries - in accordance with the Polluter Pays Principle (PPP) - are taking measures to expand private sector (corporate) responsibility -.This approach of Extended Producer Responsibility (EPR)" and, "When properly undertaken, EPR's strength lies in - the Polluter Pays Principle".

5 According to OECD Guiding Principles concerning international economic aspects of environmental policies adopted in 1972, the Polluter Pays Principle is a principle "to be used for allocating costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in the international trade and investment". It further continues as, "This principle means that the polluter should bear the expenses of carrying out the above-mentioned measures decided by public authorities to ensure that the environment is in an acceptable state. In other words, the costs of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption". OECD Guiding Principles Concerning International Economic Aspects of Environmental Policies.

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Figure 1 Cost burdening to Producers and Consumers (Case 1)
(Waste treatment cost is internalized into price of goods)

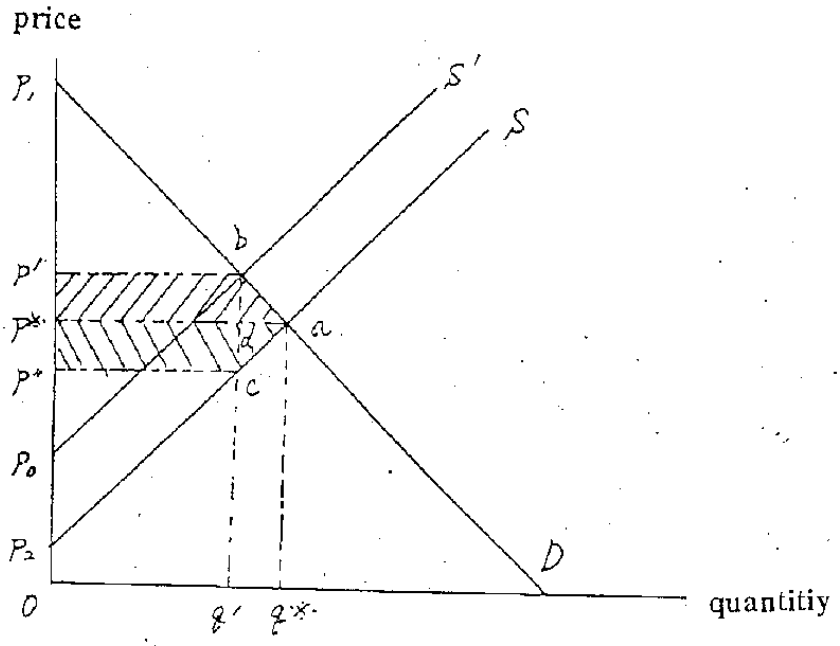


Figure 2 Cost burdening to Producers and Consumers (Case 2)
(Waste treatment cost is internalized into price of goods)

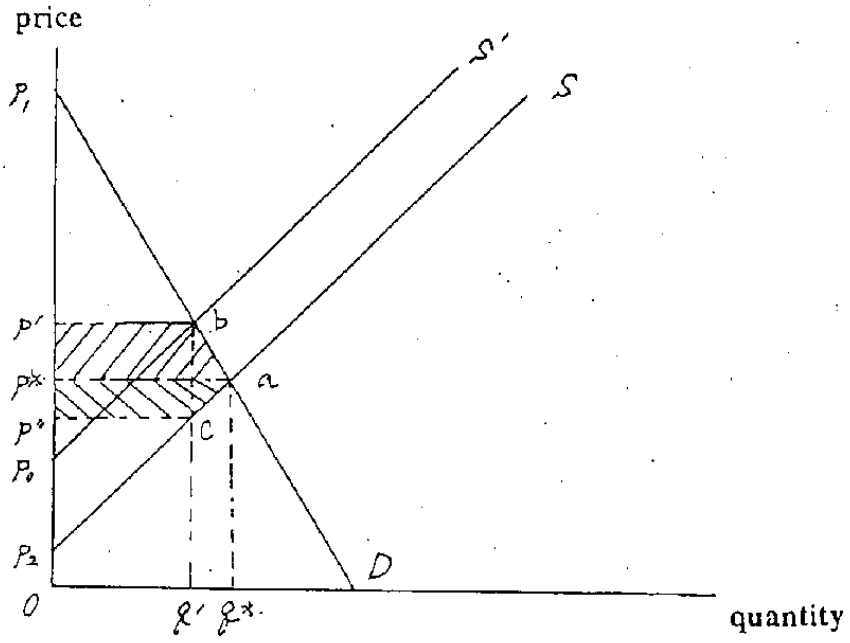


Figure 3 Cost burdening to Producers and Consumers (Case 1)
(Consumers pay waste treatment fees at time of discharge)

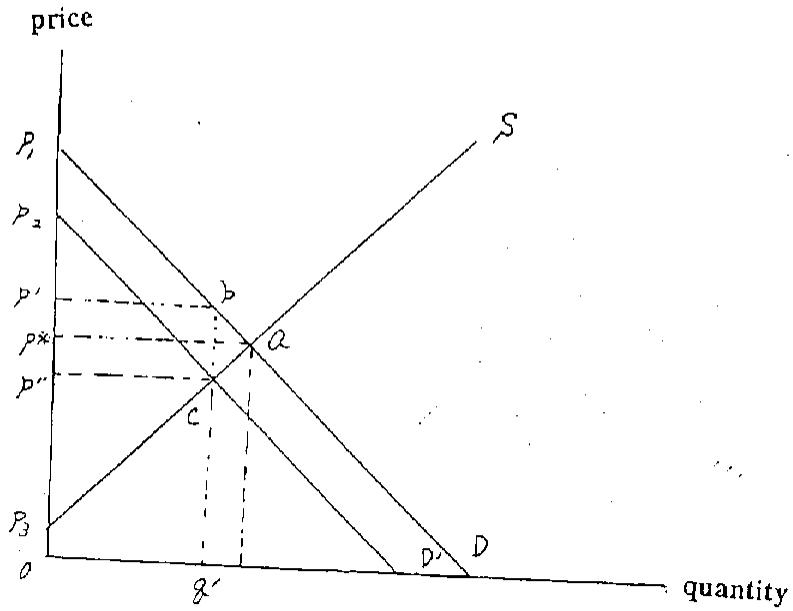
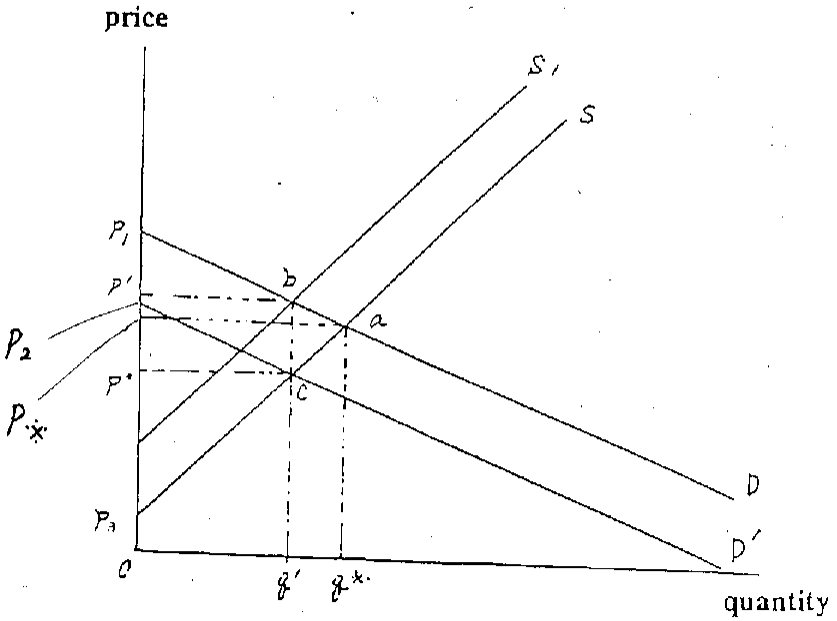


Figure 4 Cost burdening to Producers and Consumers (Case 2)
(Consumers pay waste treatment fees at time of discharge)



CAN INTERNATIONAL COMPLIANCE REPORTING BE HARMONIZED?

by
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EPR SESSION 4

Introduction

In the last few years, extended producer responsibility (EPR) programs have been established throughout many OECD Countries. Industries selling products on a global basis are now attempting to comply with these programs. Since each of these programs is different in its methods of determining fees, responsible parties, data requirements, labelling requirements and other reporting requirements, the message sent to manufacturers or producers is confusing at best and has limited the effectiveness of these programs. Additionally, in many cases the cost of preparing and complying with these requirements exceeds the fees paid. (See *"How Manufacturers Are Responding to Extended Producer Responsibility Programs and How These Programs Can be Made More Effective"* submitted for the 12/98 Washington DC OECD workshop).

This paper discusses ways to simplify and harmonize the reporting requirements for industries participating in EPR programs. Simplified and harmonized reporting will improve compliance, reduce compliance costs, reduce paperwork, improve data accuracy and send a clear message to producers on how to improve their packaging and products.

The extended producer responsibility programs, established in many OECD Countries, are now serving as models world-wide. Most producers selling products on a global basis are now attempting to comply with these programs. By keeping the programs simple ("KISS"), you will send a clear message regarding your program goals and reduce administrative costs for the third party organizations, government regulatory agencies and the regulated community. Reporting requirements for industries should be limited to the amount of packaging they place on the market. This would include the weight and material type(s) of their packaging. They should be required to submit data that shows that they pay their fair share.

Consider implementation factors during program design

Just as the EU now requires manufacturers to consider how their packaging and products will be managed after their useful life as they design their packaging and products, governments must consider how their EPR programs will affect producers and other responsible parties. Program complexities, inconsistent definitions, elaborate reporting requirements and placing requirements on industry segments that have no

control over product and packaging design increase costs, reduce effectiveness and produce data of limited value.

In establishing EPR programs, do not rely on producer fee reporting requirements to satisfy all of the data requirements necessary to monitor the EPR program. Third party organizations or government regulatory agencies can supplement their data needs using surveys, studies and selective report auditing.

Figure 1

DATA THAT PRODUCERS CAN PROVIDE

For the product

- Sales by country by month
- Declared weight and/or volume of the product
- Product to package ratio

For the packaging

Data by packaging component

- Packaging Category
  - Primary, secondary, transport, insert, etc.
  - Material Type (standard definitions must be established)
  - Plastic by resin type(1-7 only)
  - Paper
    - Corrugated
    - Paperboard
    - Flexible paper
  - Glass
- Clear
- Brown
- Green
- Other
- Aluminum
- Steel
- Other Metals
- Wood
- Textiles
- Ceramic/pottery
- Laminates and Composites
- Number of uses
  - reusable or refillable
- Recycled content
  - Pre-Consumer
  - Post-Consumer

Limit reporting requirements to the industry sector that controls the product and packaging

Don't make industry sectors report data that has no meaning to them and that they have no control over. For example, the United Kingdom has increased the amount of reporting entities ten fold (now all raw material manufacturers, converters, packagers and retailers must submit reports). A retailer in the UK needs detailed packaging data on every item it sells. In some cases this can be more than 100 000 difference items. A corrugated box manufacturer in the UK must know where its clients sell their products packed in its boxes. Since, in both cases the data must be derived from a third party, the cost of data collection is very high and the accuracy of the data reports is very poor. Only the producer can easily obtain the data required by most third party organizations and government regulatory agencies. Further, the fees paid by each sector become so diluted that the economical justification to modify the packaging (by the product manufacturer) is diminished.

What data and indicators from the producers are needed to monitor the progress of an EPR program?

Inventory the Responsible Entities

One of the most important factors is to insure that all regulated entities are paying their fair share of costs (again regulated entities should be limited to producers and importers). A survey conducted by the Austrian ministry has found that half of all Austrian companies are ignoring the packaging waste law. Those companies paying their fair share and incurring the cost of the regulatory burden want to be assured that

they are paying the lowest possible costs. This will only happen if all responsible entities pay their fair share. Therefore, one of the most important elements of a program is to identify all regulated parties and insure that they all participate in the compliance program. Free riders not only increase the fees that the other regulated parties must pay; they also reduce the incentive of others to submit accurate reports.

Track the amount of packaging waste placed on the market

Simply put, third party organizations and government regulatory entities need to know how much packaging waste (weight) by material type(s) is placed on the market in a particular country. They do not need to know each packaging element (caps, tubes, bottles, jars, baskets, boxes, or casket) or whether the box contained rice, flour or dehydrated soups. Producers should be expected to submit accurate data on the amount of packaging material they place on the market. Figure 1 lists those data elements that producers can easily obtain and that should be part of their environmental packaging database. Most importantly, using these reporting elements to set fees sends the clearest messages to producers. For example, if a particular material type is difficult to dispose of, the fees on that material type should be higher, therefore, sending a clear message to the producer.

If a third party organization or government regulatory entity needs specific data on the waste generation by an industry sector or the type of packaging material used by a particular industry, it should conduct an independent survey. This will be much less costly than requiring every regulated entity to submit this data.

Figure 2 lists data elements that are more difficult to acquire by producers and are not normally part of their environmental packaging database. These unique requirements can force producers to spend large sums of money obtaining the data, modifying their packaging databases and filing excessively complex reports. Additionally, collection and review of many of these data elements do little to encourage packaging change or modifications.

Figure 2

DATA THAT IS REQUIRED BY SOME COUNTRIES WHICH IS DIFFICULT TO OBTAIN

Empty Space Ratio	Korea
Packaging Elements	Belgium
Shelf Area or Volume	Germany
Rigid Container	France

For example, Korea's new packaging regulations require that you determine the "empty space ratio" on each package sold. The information needed to calculate the "empty space ratio" is contained in a five page formula requiring data elements not previously used by any other country packaging report and not easily available. In France, the fees for rigid containers are calculated differently from those of other types of packaging. Both these requirements add complexity to report filing and make data processing very difficult.

Figure 3

HARMONIZED DEFINITIONS ARE NEEDED

Materials types
Fiber requirements for paper
Definitions of laminates and composites

Standardize definitions

Standardized packaging definitions will reduce international data requirements and reduce the cost to prepare reports. Figure 3 shows areas where harmonized definitions are needed. By standardizing material definitions, reporting on an international basis would be simplified and would reduce the required data manipulation and improve data accuracy. Compromising on a uniform fiber limit standard would send a clear message to manufacturers on how to improved the recyclability of their products. For example, in the EU alone the same piece of paperboard can be defined as paper in France, composite in Germany, aluminium in Spain and other in Belgium. Figure 4 shows the amount of fiber required for a paperboard carton to be classified as paper. If we could agree to use 80% or 85% as a standard, we would reduce reporting costs and improve packaging design.

If the material is classified as laminated you pay larger fees, but the allowable limits are so variable that packaging designers do not know which standard to use. Further, maintaining a packaging database that can interpret these different standards can be difficult if not impossible to track.

Figure 4
THE AMOUNT OF FIBER REQUIRED BY THE MAJOR COUNTRIES FOR A PAPERBOARD CARTON TO BE CLASSIFIED AS PAPER

Austria	80%
Belgium	85%
Denmark	90%
France	50%
Germany	95%
Korea	70%
Luxembourg	85%
Spain	*
Sweden	50%
UK	50%

* You pay the fee for the highest cost material that represents 15% or more of the paperboard carton

Allow for electronic (Internet) reporting

To save paper and to make reporting easier, third party organizations and government regulatory agencies should allow electronic (Internet) reporting. Each third party organization and government regulatory agency should have a web-based system that would allow all packaging reports to be completed and all payments to be made on the Internet.

Keep program simple ("KISS") and send a clear message

Simple straightforward programs send the clearest messages, cost the least to comply with and are the easiest to administer. By establishing a universal set of packaging data elements (material types, weight, declared contents, etc.) with standardized definitions, industries can easily and with the least expense maintain their packaging databases. Third party organizations and government regulatory agencies will benefit from better compliance and improved data quality.

POWERPOINT PRESENTATION (Victor Bell)

CAN INTERNATIONAL COMPLIANCE REPORTING BE HARMONIZED?

For

OECD Workshop on Extended Producer Responsibility
May 4 – 7 1999, Paris

By
Victor Bell
Environmental Packaging International

Issues to be Discussed

- Cost of meeting extended producer responsibility requirements.
- Consider implementation factors during program design.
- What data from producers is really needed.
- Data that producers can provide
- Recommendations

Cost of meeting extended producer responsibility requirements

- Multi-nationals are preparing as many as 100 packaging reports per year.
- Reports require complete and accurate data.
- Data is not easily available.
- Data is difficult and costly to obtain.

Cost of meeting extended producer responsibility requirements

- The cost of preparing and submitting the reports far exceeds the cost of the fees themselves.
- Too many reports
- Too much data

Data manufacturers must have

- Each country has:
  - Different methods of determining fees
  - Different data requirements
  - Different labeling requirements
  - Data requirements are constantly changing.

Data Required by Country

- Germany
  - Weight by material type
  - Shelf area
  - Packaging volume
- France
  - You need data to be able to determine if the packaging is rigid.
- Belgium
  - Packaging elements (1-99)
  - Packaging categories (1-7)
  - Material types (41 difference types)

Data Required by Country

- United Kingdom
  - Where each of your packaging components were manufactured
  - Whether or not the final product was sold in the UK or exported
  - If you are a retailer in the UK, you must have data for each product you sell and know whether or not it was imported.
- Korea
  - Empty space ratio

Consider implementation factors during program design.

- Governments must consider how their EPR programs will affect producers and other responsible parties.

Consider implementation factors during program design.

- Limit reporting requirements to the industry sector that controls the product and packaging.
  - Only the producer can easily obtain the data required.
  - Fees paid by multi-sector programs become so diluted that the economical justification to modify the packaging is diminished

Consider implementation factors during program design.

- Insure that all regulated entities are paying their fair share of costs
  - The Austrian ministry has found that half of all Austrian companies are ignoring the packaging waste laws.
  - Free riders not only increase the fees that the other regulated parties must pay; they also reduce the incentive to submit accurate reports.

What data from producers is really needed

- TPOs and government regulatory entities need to know how much packaging waste (weight) by material type(s) is placed on the market in a particular country.
- Using packaging waste (weight) by material type(s) to set fees sends the clearest messages to producers.

What data from producers is really needed

- If a TPO or government regulatory entity needs specific data, it should conduct an independent survey. This will be much less costly than requiring every regulated entity to submit this data.
  - Waste generation by an industry sector
  - Type of packaging material used by a particular industry

What data from producers is really needed

- They do not need to know each packaging element (caps, tubes, bottles, jars, baskets, boxes, or casket) or whether the box contained rice, flour or dehydrated soups.

Data that producers can provide

- Producers should be expected to submit accurate data on the amount of packaging material they place on the market.

Data that producers can provide

- For the product
  - Sales by country by month
  - Declared weight and/or volume of the product
  - Product to package ratio

Data that producers can provide

- For the packaging
- Material Type (standard definitions must be established)
  - Plastic by resin type(1-7 only)
  - Paper
    - Corrugated
    - Paperboard
    - Flexible paper
  - Glass
    - Clear
    - Brown
    - Green
    - Other

Data that producers can provide

- For the packaging
- Material Type (standard definitions must be established)
  - Aluminum
  - Steel
  - Other Metals
  - Wood
  - Textiles
  - Ceramic/pottery
  - Laminates and Composites

Data that producers can provide

- For the packaging
  - Number of uses
    - reusable or refillable
  - Recycled content
    - Pre-Consumer
    - Post-Consumer

Harmonized Definitions

- **HARMONIZED DEFINITIONS ARE NEEDED FOR**
  - Material types
  - Fiber requirements for paper
  - Definitions of laminates and composites

Harmonized Definitions

THE AMOUNT OF FIBER REQUIRED BY THE MAJOR COUNTRIES FOR A PAPERBOARD CARTON TO BE CLASSIFIED AS PAPER

Austria	80%
Belgium	85%
France	50%
Germany	95%
Korea	70%
Luxembourg	85%
Spain	*
Sweden	50%
UK	50%

Allow for electronic (Internet) reporting

- Each TPO and government regulatory agency should have a web-based system that would allow all packaging reports to be completed and all payments to be made on the Internet.

Recommendations

- Consider implementation factors during program design.
- Limit reporting requirements to the industry sector that controls the product and packaging.
- Inventory the Responsible Entities

Recommendations

- Limit producer reporting to the packaging waste (weight) by material type(s) that is placed on the market in a particular country.
- Harmonize definitions
- Allow for electronic (Internet) reporting

Recommendations

- Keep program simple ("KISS") and send a clear message

A REPORT ON AN EXERCISE OF EPR IN JAPAN: - ELEMENTS NEEDED FOR THE SOUND DEVELOPMENT OF EPR -

by
Akira UENO
Japan Container and Package Recycling Association
Tokyo, Japan

EPR SESSION: 4

Japan Container and Package Recycling Association (hereinafter referred to as the "Association") was founded in September 1996 as the designated organization under the Containers and Packaging Recycling Law (hereinafter referred to as "the Law "), in an attempt of exercising EPR on national basis for the selected type of containers and packages.

This short report will make a brief presentation on following 5 points:

1. Function and achievements of the Association.

2. Preparation for the new system to be introduced in year 2000 spring.

3. Costs of EPR implementation.
   Costs of social reformation and associated friction among the stake holders.

4. New "Paradigm": from "product driven society" to "service driven society"

5. Proposal for the Government-Industry interaction.

1. Function and achievements of the Association

The structure and the function of the Association are illustrated in the attached schematic picture, which may require some explanation. In lieu of straight explanation about the Association, a brief introduction of the history of recycling activities in Japan would provide a background for creation of the Law and the Association.

"Recycling" has long been a kind of business in Japan, to make up scarce supply of natural resources, particularly in the area of steel and paper. This practice on the business side, and habit of recycling on the side of household merged uniquely in Japan to develop a kind of voluntary curbside collection for such material as glass bottles, steel cans, aluminium cans, and news papers. Most of the cases these materials were sold to the recyclers at fairly reasonable price, and the earnings were generally used for the community activities.

Majority of the municipal solid waste are collected by the local municipalities, and those municipalities where sorted collection are practiced, have also participated in such waste resource trading. During such happy period when the participating entities had all been benefited with a satisfaction of accomplishment, voices seeking producers responsibility were relatively low because those recyclable materials had been traded in the market place at market price. In the early 1990's, however, that market gradually collapsed due to excess supply and downward trend in demand reflecting nation's economic situation. A large number of municipalities had to pay certain amount of money to have the collected waste resources lifted by the recyclers, totally opposite to what had been practiced before. This phenomenon was called as " reverse value trade", and voices of the municipalities and residents moved the competent government to develop a counter measures by introducing partial EPR plan. Thus the Container and Packages Recycling Law had been introduced. The main theme of the law is to let the producer (final producer) bear the cost of " reverse value " trade so as to reactivate the recycling stream.

Thus the Association was inaugurated by the related industries, primarily final producers, as the core organization to move the system. The function and mechanism are as follows (reference be made to the attached schematics):

a. the manufacturers (bottlers) consign their recycling obligation to the Association by paying certain amount of fees, which have been calculated in accordance with the indices and formulae set by the government;

b. the Association accepts the request for recycling from the local municipalities for their recyclable waste resources;

c. the Association contracts recycle businesses nationally through open bid process;

d. the Association oversees the standard of such recycling business, and at the same time keeps tracking whether these recycled materials are properly utilized.

Having been given only a limited space and time, I would introduce only one example as a case of achievement that this EPR system has demonstrated since the inauguration: That is the development of PET bottle recycling. Up until 1,996 PET bottle recycling had been practiced only on voluntary basis, and the results of the recycling activities were very unsatisfactory. Admittedly, the long poor performance of PET bottle recycling had been a driving reason to have the Law introduced. In 1,996, about 5,000 tons of PET bottles were recycled , and the recycling rate was only 5%. The estimate for this year is that the recycle tonnage will be 50,000 tons and the recycling rate will become more than 18%. 10 times growth in volume and 3.6 times growth in the recycling rate in a short 3 years. This may be regarded as compelling effect of the mandatory EPR.

2. Preparation for the year 2000

Currently containers that fall under our system are glass bottles and PET bottles. From April, 2000, other plastic containers and packages, and paper containers and packages shall be included in this mandatory recycling system. Incidentally, steel and aluminium cans, paper cartons, corrugated paper boxes, and newspapers are exempted from this system due to the reason that these materials are automatically recycled in their respective market without any " reverse value " problem. In short, this is a good example that EPR theory and policy disappear when and where a material for recycle is traded under the normal market rule.

In addition the Association are destined to make contracts with about 200,000 middle and small producers and retailers for whom the Law shall be applied from next April. Meanwhile, current number of businesses that have entered into consignment contract with the Association are only 520, which are large

scale companies. This is a manageable number. It is said that the business entities that have been contracted with DSD or Eco-Emballages are less than 20,000.

In Japan, vast majority in terms of number are middle and small size entities among the business circle. In this consequence, the Association have started the first in the world kind trial by grasping the potential companies which may fall into this system from out of some 3 million firms registered with various kind of list, as the initial step, and then send written notice to the high potential companies spending substantial amount of communication expenses. While putting our effort and resources behind our own business development, it is also Association's duty to encourage development of recycling companies / plants for plastic and paper containers and packages, by establishing technical standards.

These hectic and overwhelming activities and business processes lead to the next question and appeal.

3. Costs of EPR implementation

A theory of " market failure " induced an idea of internalization of externalities, though the latter having been utilized primarily in the environmental arguments, and finally it gave a birth to the theory of EPR on the nursery bed of PPP theory. Let's admit this philosophy for the sake of constructive discussion on EPR, though I do have grave reservation to the market failure theory and PPP theory.

I understand that the core theme of EPR is to let the producer bear the cost of waste disposal and recycling in order to have those external costs properly built in the product costs. Fine, whole world seems to move into that direction, and today no one would like to reopen a futile discussion on who should be responsible for those costs.

Nevertheless, I would like to raise a few questions about the costs associated with the implementation of EPR system from the experience acquired during past two years operation of our EPR system. Here, I would like to point out that the "**costs** that the producers have to bear" in the EPR "theory" should be a sort of direct costs needed for recycling processing. I suspect that in such **costs**, no one has ever included those associated with the practical operation of the system. Have these system costs ever been estimated? This question grew during those two years of day to day operation of the Association.

EPR theory has been discussed more or less from economic/business standpoint with strong environmental implication However, EPR is a new proposal for the society in that the producer have to take up new costs and responsibility. This is a kind of proposal for the social reformation, and if it were really a reformation program, such reformation mechanism and costs should be estimated. It is beyond the capacity and ability of the producers and their system organizer. Followings are some of the costs of social reformation or the costs that are difficult to split on fair basis:

a. Legal costs to manage various frictions that arise due to alteration of current waste/recycling business circle.

b. In order to cover whole potential businesses, we producer group has to approach virtually whole nation utilizing enormous cost. This problem may be universal one.

c. Costs of building new industrial structure. To recycle a certain kind of material is, in essence, to go through a series of manufacturing process. Then it is obvious that a plant should be prepared for that purpose, and new distribution channel with new end user has to be developed. For this whole process an entrepreneurship and capital are required.

A discussion may also be needed for managing the industrial standard and its maintenance relative to the recycling industries.

d. EPR concept seems to be based on relatively large scale industries. In Japan, there are great number of medium and small size producers existing, as stated before. Our experience tells that vast majority of this level of industries would pay to the Association only a fraction of money as fee for recycling which is far short even to communication cost. Who should absorb this ?

4. New paradigm, from "manufacturing driven" to "market and service driven" society

In scrutinizing the OECD workshop record on EPR and other material as well, I noticed that the definition of " EPR " has not been firmly established yet. In the broadest definition, **Producer** may include from raw material manufacturer through distributor and retailers. In the narrowest, it is simply the last stage producer. In case of beverage industry, it means the bottlers. In any event, though, the consensus seems to define **Producer** as the final stage manufacturer to avoid confusion.

Having been engaged in a consumer goods industry for a long period of time, I would like to submit my strong question if the producers could really determine the kind of containers and packages, if they have enough knowledge concerning the containers comparable to the knowledge and capability owned by the package manufacturers and the raw material manufacturers. The final stage producers are pressured by the demanding retailers who pass the consumers preference in the shape of sales curve and share trend.

It is obvious that the producers have lost their leading power, which they once enjoyed at the time of product scarcity, and today joint force of consumers and retailers dominates the consumption society. Our society used to be driven by manufacturing, among others, and today it is driven by the market and service. Paradigm has been changed. It is my feeling that EPR theory seems to be based on the manufacturing driven concept.

In particular, market driven concept and recognition becomes really important when we consider development of recycling market and products that utilize recycled material. No recycling market and society could be built if there were no demand (pull) for the products offered. All the stake holders in the recycling business have ever experienced that mere production and presentation (push) of certain products of recycled material resulted in a miserable failure where no demand (pull) exists.

To conclude this section, I would like to emphasize the importance of inclusion of major retail industries as the most important element of the whole EPR sphere, including the international trading industries. Where are the Producers for the mountain of green wine bottles (almost all are imported) piled up motionlessly in the backyard of the waste glass processors in Japan ?

5. Government's leadership and interaction with Industries

Having had a series of workshop sessions on EPR, the discussion for this session seems to search and explore tools for implementing EPR, i. e. monitoring and reporting on the progress of EPR program. In order for any EPR plan to make success, however, I would like to emphasize importance of the initiative taken by the government and public institutions (hereinafter collectively referred to as "public sector").

Let's take look at EPR in the context of social reformation nature. In this context the public sector may first be expected to indicate a clear objective and direction of national recycling activities. In such indication, more scientific and objective figures and facts should be announced rather than creating a bunch of slogans.

Secondly, the sound recycling industries should be developed under the guidance and incentives provided by the public sector.

Thirdly, a massive campaign for recycling should be organized by the public sector. This movement is vitally important not only for developing a recycling tendency among the people but also for creating and developing the market (pull) for the recycled products.

Fourthly, the public sector are expected to prepare and provide legal and policing service / protection for the EPR activities and organs if any social friction and commotion should arise due to new phenomenon of EPR.

Now, let's take look at EPR from LCA viewpoint. We know that one of the major objectives of EPR to make a contribution for environmental protection. All the recycling activities conducted in the framework of EPR are essentially another type of manufacturing. Then the concept and rules of LCA shall be more rigorously applied because any recycling activities have to be compatible with environmental objectives. For instance, total CO2 balance of a recycling process should be less than that of waste disposal process of the same material. Simplest theory of LCA tells that " less is the best ". Followings are practical experience from our operation:

Since we started our operation in 1997, there have been a few cases of excessive long distance hauling of PET bottle bales. Distance were about 2 000 kms, and this was caused from our open bid system to determine contractors for recycling. We have no other measures to remedy this yet because the Law requires openness and fairness in pursuing the Association's job. This problem seems universal, though in a lesser magnitude, as I observed in some European countries, PET bottle bales were transported for more than 300 kms.

LCA is a kind of a map and its inventories are kind of landmarks that all the manufacturers have to observe if they perform EPR duty. No single manufacturers could produce LCA map individually, and if ever done, many different maps would be produced causing only confusion.

I would like to ask the public sector to develop and prepare such infrastructure as hinted in this section before collecting any report or monitoring EPR progress.

POWERPOINT PRESENTATION (Akira Ueno)

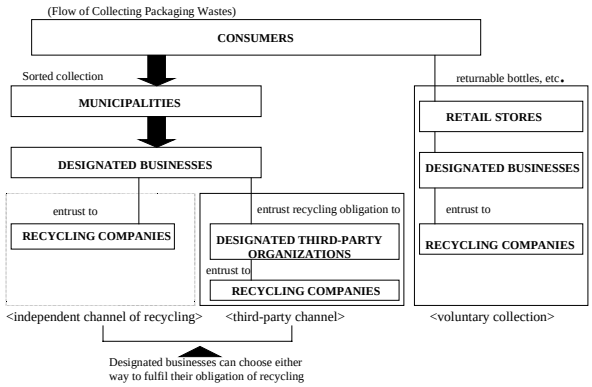
A report on an exercise of EPR in Japan
- elements needed for the sound development of EPR -

Akira Ueno
Japan Container and Package Recycling Association

OECD International Workshop on EPR
Paris, France
May 4-7, 1999

1) Function and achievements of the Association
2) Preparation for the new system to be introduced in year 2,000 spring
3) Costs of EPR implementation
   Costs of social reformation and associated friction
4) New Paradigm: from "product driven" to "service driven" society
5) Proposal for the Government-Industry interaction

POSITION AND FUNCTION OF JCPRA



COSTS OF EPR IMPLEMENTATION

Basic cost of EPR: Costs of waste management and recycling

Extended costs of EPR: Costs of Social Reformation

- Legal cost
- Business net work and communication
- Building new business structure
- Education and propagation

EXTENT OF PRODUCERS' DUTY & OBLIGATION
Morale, Capability and Authority

PARADIGM SHIFT

Definition of " Producer " in EPR theory
Producer in the Production Driven society

Vs.

Producer in the Market and Service Driven Society
In the Market Driven Society " Pull" is the key, not "Push"
Only "Pull" can create a recycling market and society

INFRASTRUCTURE PREPARED BY PUBLIC SECTOR

Social reformation nature of EPR calls for recognition on and creation of basic infrastructure by the Government and Public Institution.

EPR can be properly exercised if and when LCA guidance be set up.

With these maps and landmarks, PRODUCERS and GOVERNMENT can reach an agreement on direction and degree of expected performance.

THE BRITISH COLUMBIA EXPERIENCE IN MONITORING AND REPORTING ON EPR PROGRAMS

by
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EPR SESSION: 4

Introduction

It is indeed a pleasure to be here with you today to present the British Columbia experience in monitoring and reporting on Extended Producer Responsibility (EPR) programs.

In my presentation today I will begin with a brief look back to the past decade.

British Columbia is a province in Canada with a large land area and a small population of just under 4 million people. About 70 per cent of the people live in the south-west corner of the province close to the United States border.

During the late 1980's British Columbians began to realize that the products and packaging they used were a major contributor to environmental pollution. Our landfills were filling up and the siting of new landfills was becoming more difficult with each passing year.

In response, in the fall of 1989 the British Columbia government embarked on a municipal solid waste management strategy. Each of the 27 regional districts in the province were required by an amendment to the Waste Management Act to prepare a municipal solid waste management plan, approved by the Minister of the Environment, by the end of 1995. The Plan was to include the blue print for achieving a 50 per cent per capita reduction in the municipal solid waste going to landfills or incinerators. Each of the Plans was to also develop a schedule for phasing out or upgrading landfills or incinerators that did not meet the provincial standards. The Waste Management Act clearly stated that the Minister could not approve the Plan unless they were assured that adequate public consultation had taken place.

In 1990 concern about household hazardous wastes (HHW) had grown to a point where consumers looked to the provincial government to solve this problem. In fact, waste composition studies of municipal solid waste going to landfills showed that 1 to 2 per cent of the waste was HHW. The province initially responded by establishing eight pilot HHW depots in eight communities. The depots collected very little HHW, served less than 0.5 per cent of British Columbia households and cost taxpayers $1.4 million per year.

The province of British Columbia contributes to the municipal solid waste management strategy

In the development of their municipal solid waste management plans, the public provided clear input to the regional district and the province of British Columbia that they wanted the consumers and brandowners of hard-to-dispose-of waste, HHW and packaging that caused littering to be part of the solution to the problem.

In 1990 the province of British Columbia announced that consumers would pay a point-of-sale levy of $3 per vehicle tire and $5 per vehicle battery. These environmental levies of approximately $14 million per year were directed to the Sustainable Environment Fund, to pay for the programs to collect and recycle the tires and batteries and to finance other environmental programs.

In 1991 the Ministry of Environment established the Financial Incentives to Recycle Scrap Tires ("FIRST") and Lead Acid Battery Collection Programs, the first of their kind in Canada. To this point over 20 million vehicle tires and over 5 million vehicle batteries have been collected and recycled.

Table 1. Tires

FISCAL YEAR	TIRES IN PTES**	TRANSPORTATION INCENTIVES	END USE INCENTIVES	STOCKPILE CLEAN-UP	TOTAL
91/92	1,358 000	$1,156,757	$580,220	0	$1,736,977
92/93	2,080 000	$1,686,040	$1,606,313	$10 000	$3,302,353
93/94	2,522 000	$1,510,623	$2,425,668	0	$3,936,291
94/95	2,726 000	$1,427,336	$2,452,243	0	$3,879,579
95/96	2,555 000	$1,533,893	$3,176,961	0	$4,710,854
96/97	3,242 000	$1,864,499	$3,600,984	0	$5,465,483
97/98	3,090 000	$1,644,575	$3,385,436	$110 000	$5,140,011
98/99*	3,048 000	$1,529 000	$4,090,578	$200 000	$5,900 000
Total	**20,621 000**	**$12,352,723**	**$21,318,403**	**$320 000**	**$34,071,548**

*Forecast to March 31, 1999

**Passenger Tire Equivalents (PTEs) represent the number of scrap tires transported under the program for processing and end use. Not all the tires that are transferred will be processed in the same fiscal year.

Table 2. Batteries

FISCAL year	BATTERIES	INCENTIVE
91-92*	589,362*	$ 639,408
92-93	779,433	$ 945,403
93-94	747,120	$1,486,829
94-95	720,835	$ 452,410
95-96	668,716	$ 361,725
96-97	416,734	$ 50,374
97-98	520,374	$ 520,618
98-99**	763,200**	$763 000**
Cumulative Total	5,250,592	$5,062,615

* 10 months

** Forecast to March 31,1999

The HHW strategy

In 1992, the province of British Columbia enacted the Return of Used Lubricating Oil Regulation. It requires that all sellers of oil either take back used oil at no charge to the consumer at point of sale or arrange with a third party for someone else to accept the oil on their behalf within a 4 kilometer radius in an urban area and an 8 kilometer radius in a rural area. If requested by the retailer, the Director may consider extenuating circumstances allowing the third party to go outside the 4 and 8 kilometer radius. Each seller is required to post a sign advising the consumer that they accept the used oil or they are to notify the consumers where the alternative location is for taking the oil. Each year, more than 40 million liters of used oil is collected in the province and prevented from entering the receiving environment.

Also in 1992, the province of British Columbia appointed a Waste Reduction Commissioner to make recommendations on how to deal with the HHW, other than used oil. In the Commissioner's 1994 report entitled, "Greener Homes, Cleaner Communities", it was recommended that a permanent HHW management system be developed, funded and operated by the brandowners. The report indicated that used oil, paint, solvents/flammable liquids and domestic pesticides are the most prevalent HHW in British Columbia. Together, these products comprise over 90 per cent of the HHW stream and therefore warranted immediate attention.

In 1994, the Ministry of Environment HHW depots were discontinued and the province of British Columbia enacted the Post-Consumer Paint Stewardship Program Regulation. The regulation gave paint brandowners one more option than the sellers of used oil as to how they could deal with used paint and empty containers. This third option required paint brandowners to prepare a stewardship plan for the approval of the Director of Waste Management.

All brandowners of paint have combined to submit one stewardship plan for management of paint, most aerosols and empty containers under a not-for-profit society called the B.C. Paint Care Association (PCA). A separate not-for–profit society, called the Tree Marking Association, has been formed to deal with aerosol paints for forest industrial applications. The PCA has established 103 depots throughout the province of British Columbia as outlined in Figure 1.

Figure 1. Paint depots

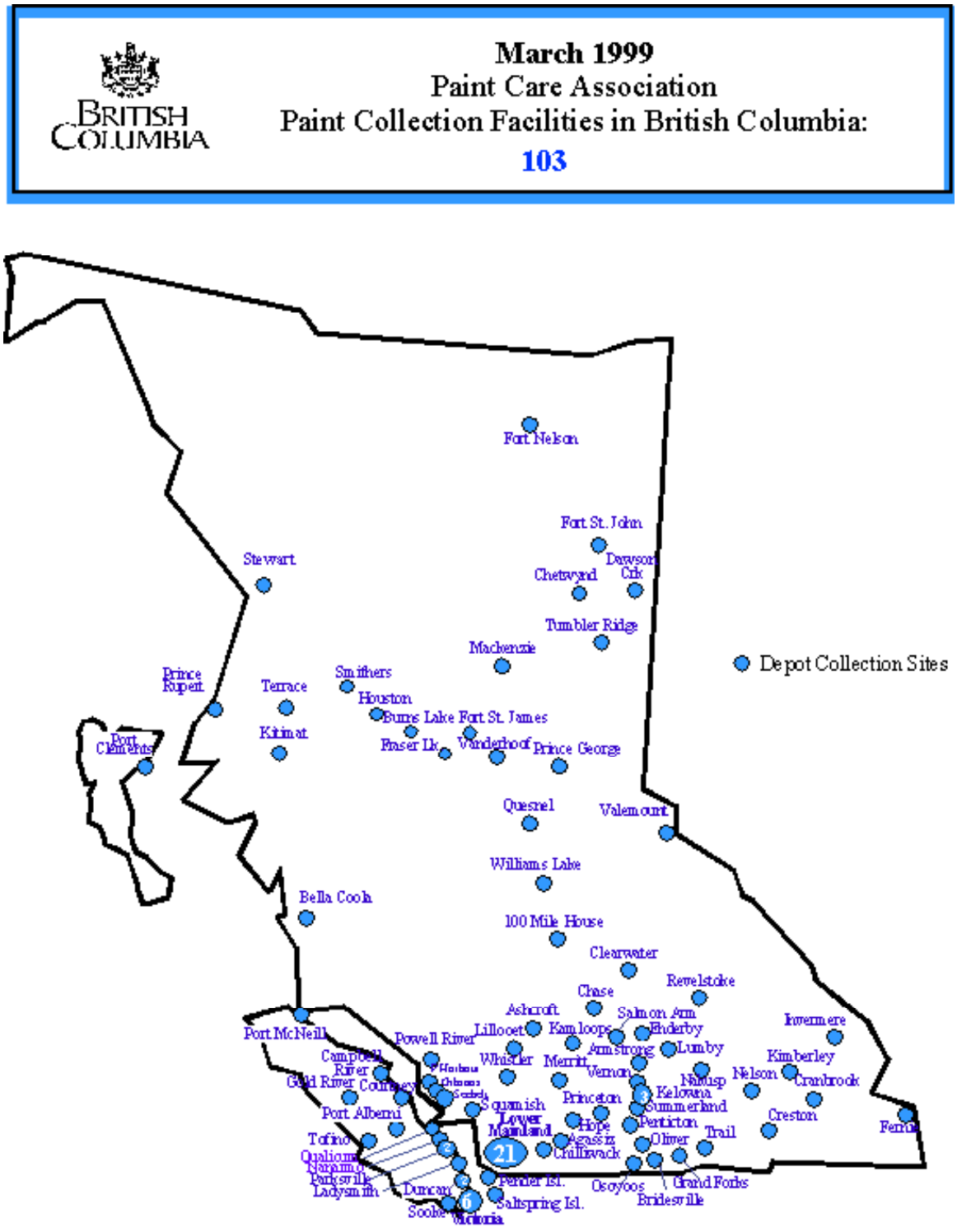


Figure 2

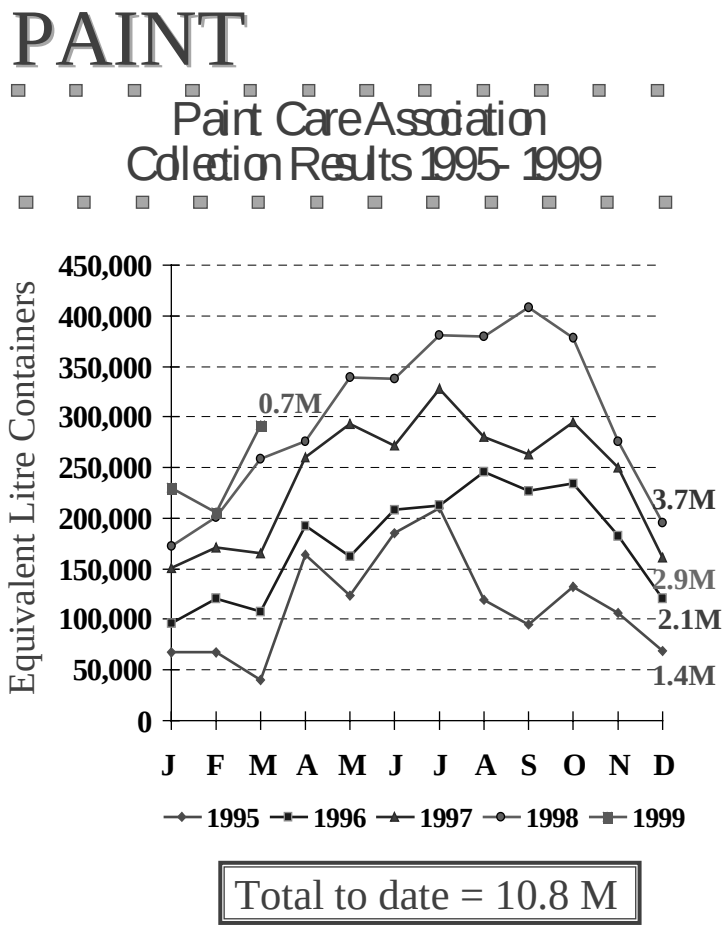
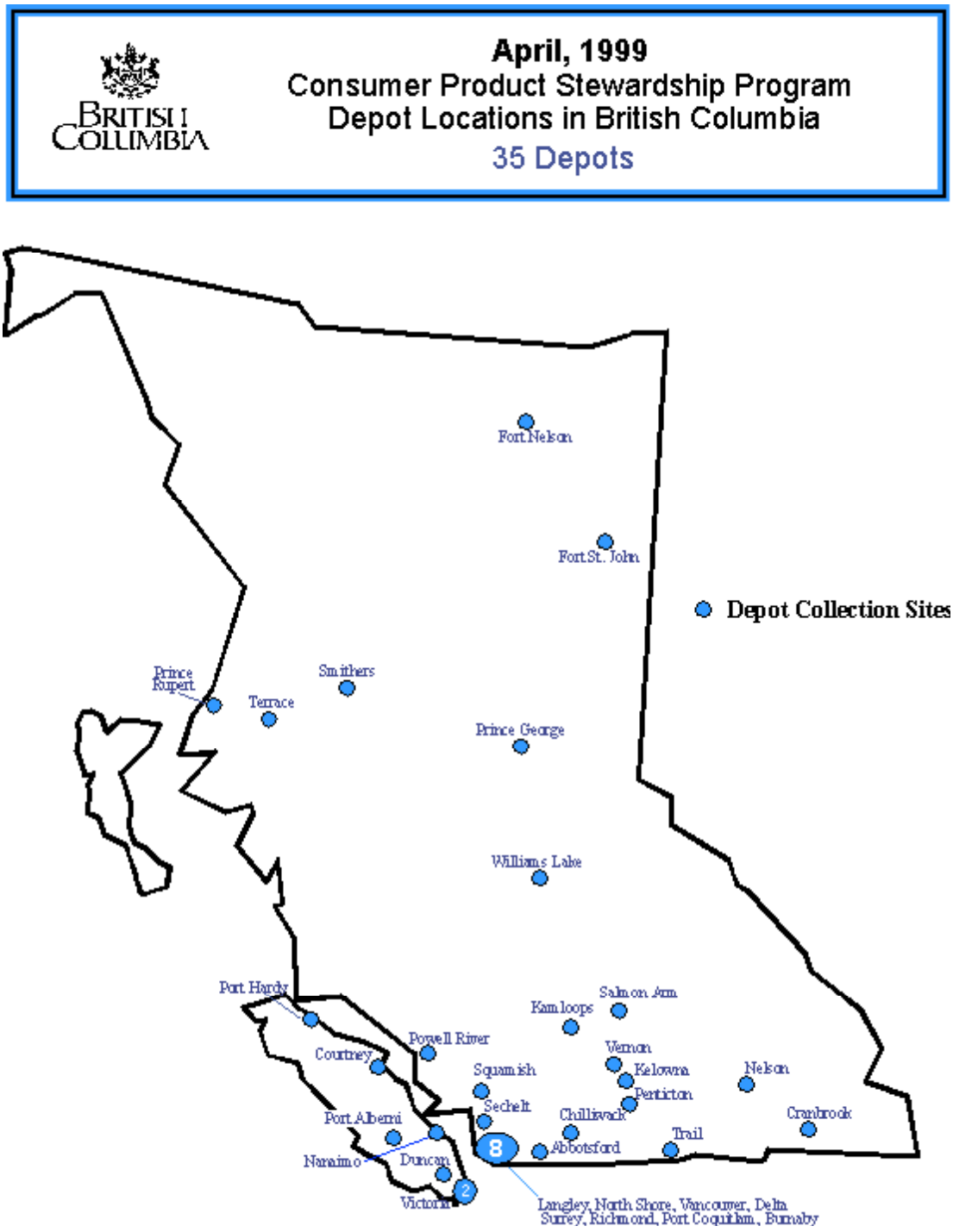

PAINT
Paint Care Association
Collection Results 1995- 1999
Equivalent Litre Containers
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
0.7M
3.7M
2.9M
2.1M
1.4M
J F M A M J J A S O N D
1995 1996 1997 1998 1999
Total to date = 10.8 M

Figure 3. Depot locations



Since the fall of 1994, the PCA has collected approximately 10.8 million equivalent liter containers (ELC) of paint, including aerosols. It is interesting to note that to date, as outlined in Figure 2, that consumers returned much more paint in the 4th full year of operation than they did in the first year.

In general, the oil based paints are shipped to approved hazardous treatment/disposal facilities in British Columbia and the neighboring province of Alberta. Most of the latex paints are recycled into speciality concrete products with the remainder going into caulking and roofing compounds. Empty paint cans are shipped directly to the steel mills or are diverted into the established ferrous metal recycling stream. The PCA also has an arrangement with the Recycling Council of British Columbia to assist them in a paint re-use program for non-profit groups and individuals at 55 of the PCA depots.

An industry charge or "eco-fee" of $0.50 per 4 liter container and $0.10 per aerosol container funds the paint collection and recycling program. This generates over $3 million per year in revenue for the PCA, all of which is used to manage the paint program.

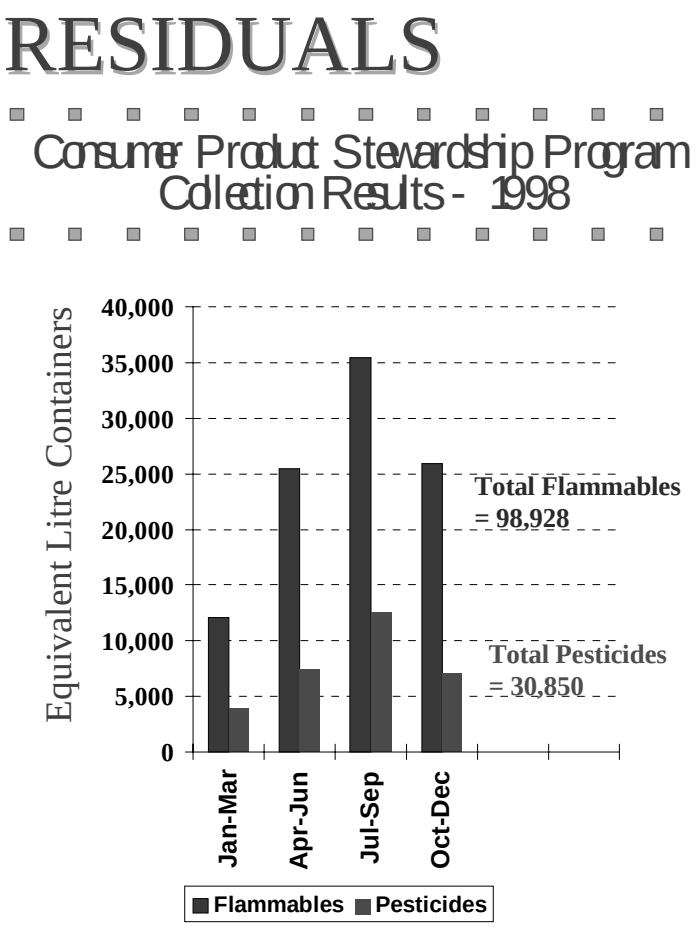
In 1996, the Pharmaceutical Manufacturing Industry voluntarily established the BC EnviRx Pharmaceutical Stewardship Program on the understanding that the provincial government would later bring in a "level playing field" regulation to ensure that all manufacturers abide by the same rules. BC EnviRx is an industry funded and operated stewardship program that ensures leftover and potentially hazardous pharmaceuticals that might otherwise go to landfills or sewers can be returned to point-of-sale pharmacies for safe collection and disposal. Products accepted at pharmacies include all prescription drugs, non-prescription medications and mineral supplements. This province-wide stewardship program involves 650 pharmacies in the province and, in total, has collected 11 tonnes of residuals to date.

The province of British Columbia approved the Post-Consumer Residuals Stewardship Program Regulation on March 26, 1997. This regulation requires the producers and consumers of solvent/flammable liquids, domestic pesticides, gasoline and pharmaceuticals to take responsibility for the management of their wastes.

Producers began the rollout of a province-wide depot network in December 1997. Thirty-four depots are currently in operation and the remaining depot is currently being put in place, with the locations as shown in Figure 3.

In 1998, a year when only a few of the depots were in operation for the entire year, a total of 99 000 ELC's of solvent/flammable liquids and 31 000 ELC's of domestic pesticides were collected, as shown in Figure 4. Many of the brandowners have chosen to fund the program by charging an eco-fee of $0.40 per liter for solvent/flammable liquids and $1.20 per liter for household pesticides. The gasoline and pharmaceutical industries do not charge an eco-fee; rather they internalize their costs without directly passing them on to the consumer.

Figure 4



Expansion of beverage containers under deposit/refund

In December 1997 the province of British Columbia enacted the Beverage Container Stewardship Program Regulation, with all beverages other than milk to be under a deposit/refund system by October 1, 1998. Two subsequent amendments exempted both polycoated containers and flexible plastic drink pouches until October 1, 1999.

The regulation required that the beverage brandowners submit a stewardship plan to the Director for approval, outlining how they proposed to collect and recycle a minimum of 85 per cent of the beverage containers sold within two years of the regulation coming into effect. The regulation required that all retailers of beverages accept for full refund a minimum of 24 containers per person per day and unlimited quantities be accepted for full refund at depots approved under the stewardship plan.

Beverage brandowners decided to submit three main stewardship plans for approval to the Director of Waste Management. The domestic beer and cider industry submitted their own stewardship plan while the provincially owned Liquor Distribution Branch submitted a stewardship plan on behalf of the wine, spirit and import beer brandowners. All the non-alcoholic beverage brandowners formed a non-for-profit society, called Encorp, to operate and manage their stewardship plan.

The estimated beverage sales mix in British Columbia is outlined in Table 2 below.

Table 2. **Estimated beverage sales mix in British Columbia**

	Litter Act System		**Expanded Deposit-Refund System**					**Exempted Containers**		
MILLION UNITS	Beer & Coolers	Soft Drink	Wine & Spirit	Water	Fruit Drink	Juice	**Subtotal**	Polycoat	Milk	**TOTAL**
Glass	237.9		58.3	20.0	20.0	25.0	361.2		2.5	**363.8**
Aluminium	374.9	404.9			12.6	12.6	805			**805.0**
Plastic	2.1	105.8	1.1	51	2.5	10.7	173.2		19.9	**193.1**
Polycoat							0	73.0		**73.0**
Gable Top							0	11.0	147.6	**158.6**
Bag In Box			0.6				0.6			**0.6**
Other				3.0		17.0	20			**20.0**
TOTALS	615.0	510.7	60.0	74.0	35.1	65.3	1360	84.0	170.0	1614.1
% of Total	38.1%	31.6 %	3.7%	4.6%	2.2%	4.0%	84.3	5.2%	10.5 %	100%
TOTAL CONTAINERS UNDER DEPOSIT:								**1.360 Billion**		
TOTAL NEW CONTAINERS OCT. 1, 1998:								**234.4 million**		
POLYCOATED CONTAINERS (EXEMPT TO OCT. 1, 1999):								**84.0 million**		

Source: Estimates based on Perrin Report.

Stewardship regulations place responsibility and accountability on industry brandowners

Industry stewardship is defined as "a comprehensive management system that ensures that responsibility and accountability for pollution prevention is assumed by the appropriate parties." Industry brandowners are required to submit for approval to the Director of Waste Management a Stewardship Plan that provides the comprehensive management system that will be implemented to achieve the requirements outlined in the particular regulation.

Industry expectations

The British Columbia Ministry of Environment has been working with industry in the development and operation of industry stewardship programs since 1992 when the Used Oil Regulation was developed. During the past seven years, there are some common elements that industry require in order to make an industry stewardship program function.

The common required elements include the following:

1. **Level Playing Field:** If brandowners are to remain competitive within the framework of an industry stewardship regulation it is essential that all brandowners, whether domestic or import, must adhere to the same requirements.

To minimize government bureaucracy, the British Columbia Ministry of Environment does not keep a registry of who should be included in the regulation. It is up to the stewardship agency or one of the competing brandowners to advise the ministry if a particular brandowner is not adhering to the regulation.

2. **Compliance and Enforcement:** If a stewardship agency or brandowner advises the ministry that a competing brandowner is not part of an approved stewardship agency, it is essential that an expeditious, but diligent, process be undertaken by both the stewardship agency and the ministry. The stewardship agency is first required to confirm to the ministry that the allegation is true.

Assuming the allegation is confirmed, it is essential that the Ministry of Environment take immediate steps to ensure that the non-compliant brandowner either complies with the regulation or enforcement action is launched by the ministry against the brandowner. Experience in British Columbia has shown that in a competitive market, where substantial eco-fees are assessed by the brandowners complying with a regulation, they are especially vulnerable to losing significant market share by a competitor brandowner not complying with the regulation.

3. **Flexibility**: The paint stewardship plan operated today in British Columbia by the Paint Care Association does not resemble the first stewardship plan submitted and approved by the Director of Waste Management in 1994. It is essential for industry that there is enough flexibility within the stewardship plan to make the necessary changes that are required, but only become evident once the program is well underway.

It is also important to the brandowners that there is enough flexibility within the stewardship regulation to provide them with sufficient options within which to achieve the ministry objectives. For example, for the pharmaceutical industry return to point of sale was the preferred option. However for the paint, solvent/flammable and household pesticide brandowners, the point of sale return option was not considered feasible or viable. Another example of flexibility was the amendment to allow for more reasonable storage and transportation requirements when handled by an approved industry stewardship agency such as the PCA.

4. **Funding Source:** It is important to brandowners that they be allowed several options for obtaining the funding required to pay for substantial capital and operating costs involved in a successful industry stewardship program. If the brandowners chose to fund their program cost though an eco-fee shown separately on the sales receipt, experience has shown how critical it is for the regulator, stewardship agency, brandowners and retailers to work closely together.

Retailers and brandowners need to communicate an accurate and consistent message to the public about what the eco-fee is, who is collecting it and how it is spent. It has to be made clear that the eco-fee is not a government tax and that none of the eco-fee revenue goes to government. Since the eco-fee is considered part of the price of the product, the federal tax (GST) and the provincial sales tax (PST) is applied on the eco-fee. The public has expressed significant concern over this issue.

If an eco-fee is assessed, the timing for when the eco-fee is introduced is very important. If the eco-fee is introduced too far in advance of the opening of the depot collection system and the release of public information, the consumer expresses concern about being required to pay for something for which there is no service. Of course, the stewardship agency needs to implement the funding source in sufficient time to be able to finance the considerable initial capital costs to implement an industry stewardship program.

Government expectations & performance measurements

How do you know that the brandowners have successfully implemented an industry stewardship program and what are the key measurements required to make the determination? It is suggested that the following key requirements and performance measurements be required and/or addressed, either in the regulation or the approved stewardship plan:

1. **Maximize Diversion from Landfills, Incinerators or Unauthorized Dumping:** In the Beverage Container Stewardship Program Regulation, there is an 85 per cent recovery target specified in the regulation. In most of the approved stewardship plans for HHW and beverage containers, there is a requirement that the industry stewardship agencies submit annual independent third party audited financial reports. The reports are to outline the recovery rates, revenues, expenditures and show how the recovered materials were either recycled or safely disposed of.

2. **Reuse and Recycle:** Most industry stewardship regulations require that either all or a specified amount of the recovered materials/containers must be reused or recycled. The Beverage Container Stewardship Program Regulation specifically prohibits the landfilling or burning of the recovered containers.

The Paint Stewardship Program Regulation requires that 70 per cent of reusable and recyclable portion of the recovered paint must be either reused or recycled, while the remainder is allowed to be disposed of in approved hazardous waste treatment and/or disposal facilities. It is a requirement of the approved stewardship plan that the agency report on the location and the amounts of materials sent to the approved treatment/disposal facilities.

3. **Consumer Awareness:** The best-designed program in the world is not successful if the public is not aware of its existence. It is essential that the approved stewardship plan contain sufficient public education and information to create a well-informed public. From the brandowner's perspective, their concern is that the level of awareness be balanced to preclude an overuse of the system with backlogged residuals in the very early stage of the program.

A toll free telephone hotline service, point of sale public information and media advertising are all important components of ensuring a well-informed public. In addition, it has been determined that where the public has observed the "eco-fee" as a separate line item on their sales receipt, the awareness level of the public has increased.

While it may be difficult to measure "awareness" it is certainly not impossible. Several years ago we did a survey of several thousand households in British Columbia to determine the awareness level of the paint and used oil programs. Just over 40 per cent of those surveyed knew the location of their closest used oil depot and 33 per cent knew the location of the nearest paint collection depot.

Consideration might be given to specifying an "awareness level" in per cent in the regulation or approved stewardship plan and requiring that an independent survey be undertaken periodically to determine if the awareness level is being met.

4. **Consumer Convenience:** Assuming that the public is aware of the program, a key performance measurement, that is difficult to measure, is how convenient does the public consider the service to be. What is the threshold in time and distance beyond which the consumer will not take used materials to the nearest collection facility? Recognizing that this threshold will vary from person to person, depending on a number of factors, what is an acceptable "threshold"? In addition, public feedback through the toll free hotline service is also a good indicator of public convenience and awareness.

In the same survey, referred to under consumer awareness above, those surveyed who were aware of the program were also asked if paint and used oil collection facilities were conveniently located and were open at convenient times. Eighty-three per cent considered the used oil collection facilities to be convenient and 74 per cent felt that way about the paint collection facilities.

From the brandowner's perspective, the balance between cost and convenience is important. The number and location of depots, as well as hours of operation, are important factors in determining the overall cost of the program, both to the brandowners and to the consumers.

Another important factor for ensuring consumer convenience is continuity of service. If a collection facility shuts down, it is essential that comparable service be restored as soon as possible. If the replacement facility is in a new location, it is important that there is adequate public information to inform the consumer.

5. **Reduce:** In the longer term, the overall success of some of the HHW stewardship programs is not the amount of HHW collected at depots and recycled. I would suggest that long term success is informed consumers that only buy what they need and use what they buy.

In addition, over the long term the informed consumer will choose the less toxic product over the more toxic product. An example of this is the consumer shift from oil based to water based paints. Not only will there be less toxic paints requiring disposal, there will be less solvents needed for cleaning paintbrushes and thinning paints.

6. **Local Government:** An important partner in the implementation of the stewardship programs for both the regulator and the brandowners is the local government, as represented by the towns, cities and villages throughout British Columbia. Local governments have an important role to play in both the implementation and operation of an industry stewardship program.

The input received from the public, through their elected local government representatives, are an important barometer of the success of a stewardship program. Some stewardship agencies have found local governments to be good partners in helping to site collection facilities and in some cases to operate the facilities on their behalf, with full cost recovery.

7. **Environmental Protection:** The ultimate objective and measure of success of an industry stewardship program are better environmental protection for present and future generations. There are a number of ways to measure the quality or "state" of the environment. However, the difficulty arises in trying to sort out how much each of the outputs is having on the receiving environment.

One possible way the province of British Columbia is considering for determining the long-term success or performance of various industry stewardship programs is to conduct waste composition studies of garbage sent to disposal facilities. If no HHW is found in the garbage stream we could then also assume that the consumer is not dumping the waste down sewers or abandoned the waste on someone else's property. The same could be true for measuring the success of the beverage container stewardship program.

Conclusion

In conclusion, the British Columbia Ministry of Environment has in the last eight years made major progress in the development and implementation of industry stewardship programs for HHW and beverage containers, but a lot of work is still required.

In keeping with the user pay principle, the province has moved from government managed and taxpayer financed HHW programs in the early 1990's to full industry stewardship programs whereby the producers and users bear the cost for proper HHW management. These are "second generation — cradle to cradle" environmental management programs based on the principles of industry efficiency, accountability and environmental responsibility.

The challenge I would leave with us all is how do we jointly work towards a common goal for monitoring and measuring EPR programs, based on our collective experience thus far and a common expectation for the future.

Above all, we must recognize that the smart and successful economies of the 21st century will be those that have recognized that the key to lasting prosperity is not how to tradeoff the interests of the economy against those of the environment. Rather, it should be how to seek market advantage in meeting environmental challenges and manage economies based on wise use of natural resources — economies that celebrate nature, rather than unsustainably consume and degrade it.

THE TARGETS OF EPR AND THE RELATED WASTE PREVENTION POLICIES: EXAMPLES IN CONSTRUCTION AND THE ELECTRIC AND ELECTRONIC EQUIPMENT

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EPR SESSION: 4

Abstract

Waste prevention should be seen as the main target of extended producer responsibility. Proportional and absolute targets for waste prevention can be found in the decisions made by the European Union: the EU Eco-efficiency Initiative to the United Nations suggests a target of 5 % increase in resource productivity as compared to current level. According to the EU's 5th Environmental Action Programme the waste quantities have to be stabilised at EU average 1985 level.

The EPR -decisions should include differentiated targets for waste prevention following the EU waste hierarchy. The producer should be made also economically responsible for reaching the targets.

The most important measure to be taken to promote waste prevention is to change taxation so that it favours employment and disfavours the use of natural resources. In addition to economical instruments there are various informative and regulatory ways for promote those targets.

The life cycle resource efficiency has by far the same consequences for construction as in electric and electronic equipment. In addition to save resources in the production phase it means enhancing the life of the product by producing durable, flexible, improveable, repairable and reusable products and by repairing, maintaining, improving and reusing them. The efficient use can be promoted by preparing multipurpose products or developing products and services. This way the number of users of a building or part of it or some electric and electronic equipment can be increased manifold.

Waste prevention seems in many cases to bring along also significant economic savings. But it can also demand a radical change in attitudes of the producers and the users of the products: it requires a shift from just making products to taking care of them and from purchasing and owning to sharing, leasing and lending.

1. Targets for EPR and waste prevention

There is a wide general support to the principle of waste prevention. However, in practice it has been difficult to include waste prevention targets or activities on national agenda in many EU-countries because

of the fear of creating barriers to free trade. Also the industry has been afraid of loosing markets to products coming from countries with no waste prevention measures.

Generally extended producer responsibility is understood as a means for arranging the recycling or energy recovery of the used products. The targets and policies for waste prevention have largely been forgotten in EPR-decisions. One of the reasons is claimed to be the absence of such targets also in the EU directives. Actually in Finland the Waste Act has been interpreted to exclude the possibility to set targets for waste prevention (e.g. in the Finnish EPR decisions on discarded tyres and waste paper).

It is important to set waste prevention targets and measures in the EU/OECD-level including the distribution of the products and services on European market. The targets for waste prevention can be taken from the EU Eco-efficiency Initiative to the United Nations in April 1997. The initiative is based on studies which indicate that by the middle of the next century there should be on an average ten-fold increase in resource productivity compared to current level. This means 5 % reduction of resource use per year during 50 years. The interval target according to factor 4 is 7 % /year during 20 years.

Eco-efficiency goals show waste prevention targets in relation to GDP. Growth in production and consumption has until now outweighed the environmental benefits of efficiency increase. This seems to be the case in the future, too. To prevent that, the sufficiency principle has to be adopted and absolute targets for waste prevention set. At this point it might be reasonable to adopt the absolute prevention target from the EU's 5th Environmental Action Programme: "the quantities of generated waste should be stabilised at EU average 1985 level".

In addition to targets for waste prevention the EPR -decisions should include differentiated targets for recycling and energy recovery following the widely accepted waste hierarchy that is included e.g. in the EU waste policy. Otherwise the producer is likely to prefer energy recovery to recycling and recycling to waste prevention.

Reuse can and should be seen as waste prevention, since reused products or dismantled product parts do not become waste, but can be used as such or in new or furnished products. By changes in design and production it is possible to make products or parts of them more feasible for reuse. Detailed prevention targets should include a separate target for the reuse for each group of products.

As part of waste prevention the longevity and the efficient use (e.g. shared use) of the products should be targets in EPR. In construction sector the possibilities to develop the shared use of rooms and electric products are various. In block houses every household does not have to own the electric motors for freezer, air cooler or vacuum cleaner. They can be owned and maintained by the real estate company and situated in the maintenance room of the block, and yet the services of this equipment can be enjoyed in each dwelling.

The most effective means for promoting EPR and waste prevention are the economic ones. At the moment the structure of the taxation makes labour expensive and discourages employing. The taxation should favour the use of human labour and create pressure to reduce the use of natural resources. That would make it possible to use enough time for proper planning, careful work, sufficient maintenance and skilful handicraft. All of these would add to the longevity of the products.

Since establishing resource taxation at least in EU/OECD-level is probably a time demanding task, the "waste fees" - carried at the point of setting an equipment to market should be used as a quicker tool. The fee for each group of products should cover the costs of reuse, recycling, recovery and environmentally sound disposal.

In the following chapters waste prevention is viewed as the main focus in EPR in construction and electric and electronic equipment.

2. Waste prevention and EPR in construction

Construction of houses and infrastructure and the real estate maintenance are of great significance to most national economies. In Finland the buildings, the building sites and the infrastructure form 70 % of the national capital. In addition it has great effects on the environment. In Finland the use of natural recourses in construction is approximately 20 tonnes per inhabitant. The overall material flows of the construction and building maintenance are many fold compared to this.

Building and construction is a special question for the EPR because of the - compared to other products - usually long life-time of the products and the often short life-time of the producers (construction companies). The responsibility for the building touches several actors during the life cycle: the producers of the materials and products, the planners, constructors and developers in the processes of planning, building and renovation plus those in charge of the maintenance and demolishing.

Waste prevention should be paid attention to during the whole life cycle of a building from site planning and material production to maintaining and to waste phase. The waste preventive measures are connected with several things: materials, devices, planning, construction work, etc. One crucial point is the planning stage, where such things as the variability, durability and easy reparability of the buildings and also the reusability of construction parts are defined by far.

In the following the different stages and means for waste prevention in construction are discussed.

Longevity

To prolong the use of the houses they should be planned durable, flexible, repairable and easy to maintain. In the recent decades there has been the quality problems in the new and renovated buildings. These problems cause considerable amounts of waste and a need for new materials. Among the most frequent problems are moulding constructions and short lived external wall concrete elements (even only 20-25 years). Even the latest instructions for construction and planning suggest 50 years to be the target service life for a house. Since it is possible with normal materials and building methods to make houses that last even hundreds of years the target of 50 years is to be considered deliberate waste of resources.

It has been estimated that most of the defaults in a building project are caused in the planning and starting phases and only 30 % appear during the construction. The mistakes in planning are according to experiences especially hard to find during the project. To have sufficient control and supervising from the early planning phases seems necessary.

In many countries there are directions for recommended arrangements for contracts in building and other construction projects. Normative instructions on those arrangements are not that common. What comes to the prevention of the defaults the constructor should be made tightly responsible of the possible defaults - even in case they are perceived after several years.

In the Nordic countries the construction inspection is moving to the direction of documented self control and to some extent to independent inspectors' control. Systems for voluntary qualification certificates have been set up for companies and persons in building business. Often the developer of a dwelling house is not the real representative of the becoming users. In these cases minimized public control means a

possibility to lower durability etc. if no other means related to responsibilities and info on the products are used effectively.

One simple means to avoiding defaults in building is to have at least the names of the main architect and other main planners and constructors in a permanent plate in the facade or main entrance of all the new houses. The cars, suits, shoes and elevators all bear the names of the producers. Why would not a building?

The producers responsibility for construction works' quality can be arranged by guarantees for certain time periods, but since the contractors may go out of business before any serious defects are perceived financial commitments are needed. One possibility is to have all the constructors insure their projects. The indemnity period should be at least 10 years, since according to experiences it may take several years to discover the defaults for instance in the installations. Now the liability period, based usually on agreements between the constructors and the clients is normally a few years from the completion.

In respect to resource use it would be ideal if the constructor takes care of the maintenance of the house or constructed infrastructure for e.g. 10 years from the completion. It would grow his interest in making durable buildings, that are easy to maintain and repair.

In a long run a well functioning and strict eco-labeling system for products and services would be one way to diminish the overall environmental effects of the materials and services. One of the main criteria for the label should be the longevity of the product accompanied with reusability through easy dismantling and structures for reusing used equipment and parts of them. This goes with construction as well as with EEE.

In order to have good maintenance a profound plan and instructions for maintenance and repair plus instructions for use are needed. To give the so-called maintenance book for a house is common in Finland nowadays.

Waste reduction in construction sites economically feasible

Prevention of the construction waste in construction sites is proved easy and economically profitable. According to the experiences in Finland it is possible to reduce the quantity of waste to one third of the normal in new construction sites and to achieve cost savings between 0,5-1 % of the total costs of the project. Without preventive measures and with source separation 70 % of the waste can be recovered. The savings in costs and the natural resources in optimal recovery are much smaller compared to preventing.

The means for prevention are purchasing (e.g. wood and board) products in fixed measures, getting them with minimal and reusable packaging and with just-on-time -deliveries. The biggest savings are obtained in the material costs and the handling costs of the materials and the packaging.

The efficient use

The efficient use of the natural recourses in construction means e.g. shared use of the existing buildings and infrastructure. In Finland most saunas and free time cottages are inefficiently used. Earlier there was usually one sauna/one (block) house and public saunas. Now saunas with the needed equipment are built even to the small dwellings, and those saunas are used only 1-2 hours a week. A couple of attractive common saunas in a block could prevent some dwellers from buying or making a sauna of their own. (In every case there is a bathroom in every dwelling)

The other Finnish specialty is to own a free time cottage by a lake or seaside - there are over 400 000 cottages and 5 million people in Finland. The cottages are used approximately 3 weeks a year. Still only 3 % of the cottages are full time or part time rented and more cottages are built every year. To promote shared use rental services and economic measures e.g. taxation are needed.

Shared use of rooms in block houses can be promoted by furnishing rooms to be used by the dwellers for distance working, for accommodating guests, for washing laundry, repairing bicycles etc. The directions and the stipulations on planning can be used to encourage this.

Repairing the existing buildings saves resources compared to new construction if the repair is done respecting and using the old structures. Sometimes it is needed to change the use of a building and in those cases the flexible structures of the building mean less material loss. Also the right timing of the renovation is important. Renovating a house that still serves well is useless material flow - as well as leaving the repairs too late.

3. Reuse in construction

Sometimes it is necessary to change the use of built-up areas and to dismantle the existing buildings. Removing the buildings as such or as parts to be used somewhere else should be made a feasible option. The officials should require a plan for selective demolition and forbid to bring reusable parts to the tip and to the incineration. The use of only easily separated joints in construction should be encouraged. Economical conditions (mainly taxation and waste fees) should favour reuse and creating transactional structures such as recycling centres and market places for used construction parts. In Finland there is such a market place in the internet.

The advantages of reusability are many fold: prolonging the useful life of the products in construction, preserving valuable history and handicraft in construction and getting better quality products than the new ones. As an example: wood taken down from the 100 years old houses has proven to be stronger than the average wood from sawmills nowadays. In Finland the traditional log houses are easy to remove because of easily separable joints. It was common to remove the frame, windows, doors, roof tiles, bricks and tile stoves.

The reuse of concrete constructions, like wall elements or girders in buildings is limited by the joints that make the separation of parts difficult. Within the limitations of strength and carrying capacity the concrete elements could be used in one store buildings, like warehouses. Concrete constructions are recycled in making roads, but compared to reusing it needs much more energy.

4. EPR and waste prevention of the electric and electronic equipment

Following the waste hierarchy of the EU and the above mentioned waste prevention targets the main measures to be taken for EEE are replacing the products with services, making with minimal use of natural resources durable products and using the products efficiently.

There is a great potential to waste prevention by effective use and replacing products with services. For instance telephone answering machines can be replaced by automatic answering services, electric tools for construction or gardening can be rented, the office machinery can be leased, the office and household appliances and machines can be multi-funtioning (e.g. fax-printer-copy and fridge-freezer). The computers can be designed and produced so that they are easily up-dated and the mobile telephones so that they can be re-programmed. In block houses the household appliances can be replaced by centralized vacuum cleaners, fridges, freezers and air coolers.

EEE can in some cases, especially in industrial plants and power plants be replaced also by using natural forces. There are possibilities to use the differences both in height and air pressure instead of the electric equipment.

As the expected life time of the product is the basic information concerning waste prevention the producers should be obliged to give this info. In many cases there is already reliable information on the expected life time of EEE. Also many producers use the longevity of their product as a marketing means.

There should also be set an obligation to offer extended guarantees for EEE. The now typical 1-2 year guarantees for products that are supposed to last for 10-15 years should be prohibited as a marketing instrument.

The availability of spare parts and the maintenance and repair services should be guaranteed by the producer for at least the expected life time of the sold product. The producers together with the authorities (responsible on waste counseling) should be responsible on the counseling related to waste prevention.

In Europe the phase out of the hazardous substances in EEE can easiest be reached by stipulations in the EU directive on WEEE. In the Commissions proposal for a directive there is a good start into this direction. But in order to make profound change to less harmful substances the directive should demand to substitute substances with less harmful ones when they are available.

The change from mechanical to electric devices and the development of EEE has often shortened the life of some devices, because maintenance, repair and even cleaning are more difficult and as a result, also more expensive. Many devices are made with such technique, that instead of being able to change just the broken part one has to change the whole device or big part of it. One example is the nowadays common electric fuel pump in cars. It is usually situated in a difficult place to reach and it is also difficult to repair. The demands for easy repair and maintenance are essential for reaching prevention targets.

What comes to measures needed in the waste phase it is important to set the whole responsibility including the financial responsibility for collection, treatment, reuse, recycle, recovery and environmentally sound disposal to the producer.

Many of the ideas presented above may be viewed by the industry as unwelcome regulation, but they should be considered as a part of the general steps that have started towards the creation of an Integrated Product Policy, where the whole life cycle of a product will be taken into consideration, and comprehensive eco-design will be promoted. These ideas reflect the state of environment and the desicions and commitments in EU and OECD-countries. The industries should take waste prevention targets as a challenge to a competition where the ones with highest capacity to adopt the principle of eco-efficiency will be the market winners.

EVALUATION OF POLICY OPTIONS: A REQUIREMENT IN NATIONAL WASTE MINIMIZATION IMPROVEMENTS

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EPR SESSION: 5

Introduction

All OECD countries have developed and implemented waste prevention or minimization policies albeit differences among them. The term "waste" is reserved in this presentation, in general, for discarded products. The improvement on an existing policy needs proper consideration in any Guidance for new policies on waste prevention. There is need for a more complete evaluation since the benefits of the improvements will be incremental and the costs marginal for the additional amount of waste avoided.

The number of policy options that have been devised for purposes of waste prevention is large. When considering improvements on existent waste prevention policies, there is need to factor in their evaluation the sustainability and eco-efficiency components. Unfortunately, in the early development and implementation of most of these policies these essential requirements were not factored.

The reasons for the emergence of a new paradigm for environmental management at the private and public levels are many and discussed elsewhere. Any evaluation of improvements to an existent waste prevention policy should be conducted along the lines of the new paradigm. The concept of a national integrated product policy (IPC) is a more recent policy-oriented representation of the new paradigm. The concept has been gaining support in many countries in spite of the difficulties in framing the concept into policy and the needed flexibility in applying policy options.

The presentation examines the problems and inefficiencies that would result in applying typical extended producer responsibility (EPR) policies such as "take-back" to specific product sectors where performance efficiencies are already very high. A case in point is transport packaging where voluntary waste prevention policies have achieved remarkable success. The issues associated with the imposition of "take-back" in this packaging sector are examined making use of tentative policy performance indicators.

1. Integrated Product Policy, IPP

Integrated product policy, IPP, has not been clearly defined yet and possibly one definition will not encompass how the concept will be accepted and applied within and across different countries. It is a relatively new term that reflects the need for and the concept of the new paradigm mentioned above. As in

any development it is important that it gets started in the right direction. In order for any IPP, regardless its definition, to properly reflect the new paradigm it would be required to;

- be based on the product system;
- examine environmental impact indicators in the whole life-cycle of the product;
- give proper consideration to sustainability and eco-efficiency;
- reflect legal and commercial practices reflecting a sharing of rights; and obligations along the stages of the product system.

It is important not only to assess resources efficiency and indicators of impacts but also social preferences and product performance. In previous presentations ***(1)*** we have described a framework model explaining the new paradigm in terms of the linkage of three fundamental systems - the ecosystem, the product system and the social system. Figure 1 describes the framework model. It is important to realize the function of the product as the "currency" making possible transactions between the ecosystem and the social system. The fundamental issues of production and consumption, which are essential to sustainability, would be better analyzed utilizing the product system and the application of shared responsibility policy approaches.

As policy-makers in the European Union and OECD countries examine how to apply the new paradigm, which could be named IPP, they should reflect on why and how we arrive to the present situation. It must be remembered that the new paradigm is the result of the failure of the traditional system because of its excessive reliance on:

- "command-control" measures;
- "one-medium-at-a-time" approaches;
- absence of sustainability and eco-efficiency considerations.

Flexibility in applying waste prevention improvement policies

Truly sustainable and eco-efficient integrated product policies must be flexible since in principle, the "one-size-fits-all" approach is contrary to maximization of environmental and economics returns. Regardless the large number of policies and schemes that can be associated with product systems, these policies can be best be grouped in five (5) major categories reflected by:

- regulations- "command-control";
- price inducements;
- product stewardship;
- environmental information;
- outright banning.

Different spatial and temporal considerations should be factored in the preliminary selection of these policies before a performance evaluation of their potential effectiveness. Regulation-based approaches

permeate throughout these categories, except for voluntary product stewardship and information policies. Market-driven mechanisms can also take care of pricing and banning aspects of products as well as product stewardship requirements.

Evaluation approaches of selected policies

Any Guidance to governments regarding waste prevention or minimization policies should recommend the careful assessment of the performance of such policy or policies. Figure 2 depicts the consequences of starting with the "wrong policy" and let maturity sets in. The efficiency, and effectiveness, of the needed rectification decreases exponentially with increase maturity of the policy and the costs (or waste) increases exponentially too.

A numerical expression is presently lacking or may not be feasible at all. Nevertheless, a mixed of qualitative and quantitative indicators would help in assess the ultimate effectiveness of the planned policy. No generally accepted performance measures are available. The OECD has advanced a core of five elements that could be of help in performing such evaluation. The mechanics for each of these elements is yet to be described. In spite that we have noted important elements missing in the proposed core, we will use the OECD elements in describing specific issues around a hypothetical case example of "take-back" improvement policy for transport packaging. The preliminary OECD elements are:

- Environmental Effectiveness.
- Economic Efficiency.
- Innovative advancement.
- Administration issues.
- Political considerations.

Missing from this core of elements is the paramount consideration to:

- Product functionality and consumer preference; and
- Legal trade and commercial transaction considerations.

We recommend the inclusion of these important elements in any core of future policy performance measures. Also, there will be need to harmonize the operative tools within the selected elements and to provide considerations for the degree of flexibility in the options selected.

Description of the transport packaging sector in the USA - Voluntary and market-driven achievements

Corrugated packaging can properly represent transport packaging. In the USA, the recovery of corrugated packaging is around 75%. The average recycled content of the transport packaging is around 45%. The difference between recovery and recycled content percentages is the result of the use of recovered corrugated packaging in other sectors of the paper and building product sectors as well as normal losses during the reuse or recycling process of the recovered material.

The 75% recovery rate is the highest in the world, when considering, specifically, the demographic and geographic characteristics of the United States and the readily availability of sustainable virgin fiber. These statistics do not reflect the voluntary source reduction innovations in the last decade that culminated in an alternate rule to the old regulation for transport packaging (by truck or rail) which was based on basis weight of the package component. These reductions in material utilization, performance-based, can reasonably be estimated in 12 to 15% of transport packaging.

In addition to the recovery, recycling, and source reduction achievements of the last decade, a continued partnership effort between producers and customers contribute to an overall reduction of material use and to waste prevention. Major producers and customers, in a partnership mode, work together to continuously reduce the weight of packaging and at the same time maintaining or improving on the performance of the packaging for the specific customer.

A more sophisticated partnership with municipalities and local institutions has contributed to increased recovery amounts and they are expected to keep improving in time across the country.

Voluntary and Market-Driven. We labeled these achievements voluntary and market-driven because these two drivers of waste prevention complement each other. It is difficult, and perhaps futile, to ascertain which one is more important or the initiator of the improvement. Voluntary, in the context of this presentation, implies the absence of a regulatory regime that dictates the specific waste prevention measure. Apart from that specification, there are different factors that although not mandatory, could bear pressure on the different actors of the product chain or system to initiate voluntary actions. In fact, market considerations, consumer preferences and other political or social pressures, as defined above, drive voluntary steps. A pure voluntary policy in waste prevention is a philosophical abstraction alien to environmental, business and political realities.

In the eyes of sustainability and eco-efficiency, "voluntary' steps are evaluated, coolly, by the results. In that sense, there is little merit to implement voluntary policies that are both environmentally and economically ineffective and inefficient. This is important to be remembered by policy analysts in the private and public sectors that may be unduly pressured to initiate improper voluntary policies.

Corrugated packaging achievements have been the result of the voluntary application of the concept of "shared responsibility". They are eloquent proof of the inaccuracy of the statement that "shared responsibility is nobody's responsibility". The reality is that primary component producers, (liner and medium containerboard), packaging producers, retailers, collectors and recyclers, and consumers have shared in these achievements. Voluntary "shared responsibility' does not have to be the result of an altruistic or moral concept but rather it is the result of decentralized market-driven innovation in technology and management. Ecological improvement could take place via the dynamics of competition and the desire to improve in eco-efficiency.

A preliminary evaluation of "take-back" as an improvement policy on the transport packaging sector

In the following, some of the issues around the above mentioned evaluation elements will be reviewed in the case example of "take-back" as an improvement policy for waste minimization for transport packaging.

Environmental effectiveness- In a prior presentation ***(2),*** the author has indicated the questionable environmental effectiveness of "take-back" as a sustainable and eco-efficient policy. In that preliminary analysis, a framework assessment based on the analysis of five elements indicated clearly the inadequacy of such policy. When considering improvements on a successful performing sector, the case is further complicated and logically more inefficient. The incremental reductions in waste from the particular

product sector would be achieved at the expense of increases, usually exponential, in other resources. Fossil fuels for longer transportation differences, additional work in the reprocessing of the incremental poorer-quality recovered amounts, addition of chemical additives to compensate losses in strength, increase pollution emissions as results of the above, etc.

Economic Efficiency. A sustainable and eco-efficient improvement policy should result in either an even lower cost of the product or a minimum cost increase to society. We have seen different presentations in these workshops and at the BIAC presentation of September 1998, that indicates the economic inefficiencies of take-back measures for packaging in general. Again, when considering the marginal cost of the incremental tonne of the waste prevented above high existent levels, classical economics tell us that that incremental would be more costly than the prior level. This might be true even for the existent successful system of transport packaging. A mandatory take-back policy does not allow for environmental efficient and economic viable alternatives implemented according to local and temporal conditions. The present market-driven voluntary policy does allow for switching to other viable alternatives such as waste-to-energy and even landfilling if such assessment makes sense in a sustainable manner. Thus, flexibility is necessary in a temporal and spatial way because "eco-efficency is local" at those high levels of performance.

Another aspect of a superimposed mandatory "take-back" policy in the transport-packaging sector is the parallel systems it creates. The consequences impinge on the economics, the politics and the administrative aspects of the entire waste prevention system, and the product. Economic inefficiency is foster by the additional costs in keeping two systems not only competing for the incremental tonnage but also the new one, "take-back", interfering with the success of the existing one.

Innovative Advancement. Experience clearly indicates that centralized, state-controlled product policies are not the paragon of technological or management innovations. Centralized state-controlled product policies add to the already risk in traditional product acceptance. It has been indicated that the survivors of a state-controlled and dictated product policy are less inclined to continue innovation since competition has been diminished. Also, the threat exists that the innovation, regardless market acceptance, might not be of the choice of the state.

Political and Administrative Acceptability. The populace has not revolt, in principle, against the existent concept and practice that allocate costs of discarded product disposal to either the business, commercial or industrial, and the household disposer according to the use and benefits received from it. In a shared responsibility mode all sectors have traditionally accepted such responsibility. In this sense, there is a shared responsibility throughout the stages of the product life. In packaging, as in other product systems, it is untrue that the producer or manufacturer is subsidized and that it imposes costs to others, principally the final consumers or general population. The myth that the producers are getting a free ride on the consumers is unfortunately spread around by some. It has no basis whatsoever. It could be so if the product was lacking of any functionality and be absolutely superfluous. Transport packaging does produce tangible benefits and it adds value to the packaged product.

The administrative acceptability of a parallel system, imposed on a successful existent one, would depend on the locality and the product system. For transport packaging we can foresee administrative difficulties as the ones experience in countries like U.K. and Germany, among others.

A fundamental question in assessing improvement policies for waste prevention - The sustainable development issue

The example of transport packaging clearly indicates the dangers of mandated product policies such as "take-back", even if with the purpose of improving environmental performance. Specifically for those type of product policies not helped by assessments with a comprehensive life cycle approach, the environmental effectiveness is nil. Both sustainable development and eco-efficiency are not properly factored in or at all. Any future integrated product policy, IPP, will face a decision. Whether it will be based on decentralized innovation that would permit sustainable development and ecological improvement or whether it will be based in rigid, state-controlled policies that tend to disregard consumer's freedom of choice ***(3)*** as well as proven, legally binding property rights in transactions and ownership.

In conclusion, any Guidance on EPR to governments should address the issues discussed in the above. The Guidance must alert those governments considering improvements to their existing waste prevention policies of the dangers of not carefully evaluating different policy options. The available capacity for reprocessing any additionally recovered waste product is an important factor in countries where the waste prevention programs have not achieved the levels in the example presented here.

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EXTENDED PRODUCER RESPONSIBILITY - MONITORING PERFORMANCE

by
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EPR SESSION: 5

Abstract

The analysis of the last five years offers in the European Union, a unique opportunity to evaluate the achievements of the Packaging and Packaging Waste Directive (94/62/EC) which is often considered as a legislation promoting producer responsibility.

The data, currently available, and their comparability and reliability are presented and discussed as well as the perceived and actual results of different approaches implemented by Member States governments, industry and local authorities in the European Union to monitor the performance of 94/62/EC.

Alternatives and improvements to current approaches are presented and discussed : the importance of continuous improvement indicators is stressed for established programs.

Introduction

With the approval in December 1994 of the Packaging and Packaging Waste Directive (1), the European Union Council of Ministers and Parliament broke new ground by introducing legislation linking the management of waste and packaging.

This legislation also implemented the Polluter Pays Principle through shared responsibility between all economic operators, from the producers to the consumers.

This European legislation had to be translated into Member States legislation within 18 months of its publication in the official Journal of the European Community (31 December 1994).

The translation by the Member States of this directive in national law has very often resulted in a shift from the shared responsibility concept of the directive 94/62/EC to a legislation enforcing extended producer responsibility.

In that case the producer is the person or the entity placing the packaged products on that national market. In at least 50% of the 15 Member States, the producer is specifically identified in the law as being responsible for attaining prescribed packaging recovery and recycling targets.

Five years later, the lessons from this experience are becoming available. It is time to evaluate them and to assess the performance of the chosen approach.

ERRA, the European Recovery & Recycling Association, created in November 1989 by a small number of companies who are producers and users of packaging, has followed the development of this European directive and related Member States legislation, as well as the setting up of national valorization schemes.

ERRA members have played, and are still playing a key role in these schemes in line with their initial commitment at the creation of ERRA, 10 years ago. ERRA's mission is to help develop and implement the most environmentally efficient and economically and socially effective recovery and recycling programmes for used packaging.

Today ERRA's main focus is on analyzing the results of the implementation of this legislation and to suggest improvements to the legislation and programmes.

One of the goals is to identify if countries working under a producer responsibility legislation achieve different results from countries that have implemented sharing of the responsibilities.

The Packaging and Packaging Waste Directive 94/62/EC

The objective of this Directive was to harmonize national measures concerning Packaging and Packaging Waste in order to prevent or reduce their impact on environment and to ensure the functioning of the internal market.

The directive covers the key elements of the policies needed to accomplish this objective: prevention, reuse, recovery and recycling and setting up of related systems as well as essential requirements for packaging that guarantee its free movement within the Union.

Quantitative requirements are given for packaging recovery and recycling in the form of minimum and maximum targets to be achieved by July 2001, as well as targets for decreasing the maximum heavy metals contents of packaging.

The evaluation of product and packaging specific waste legislation

This new type of legislation, of which the Packaging and Packaging Waste Directive is a precursor, has a major objective : the limitation of the environmental impact of a product or packaging while furthering the implementation of a single European market.

All attempts to evaluate/monitor the environmental impact of packaging in general have not been successful due to the immense variability of use and of disposal that exists in Europe.

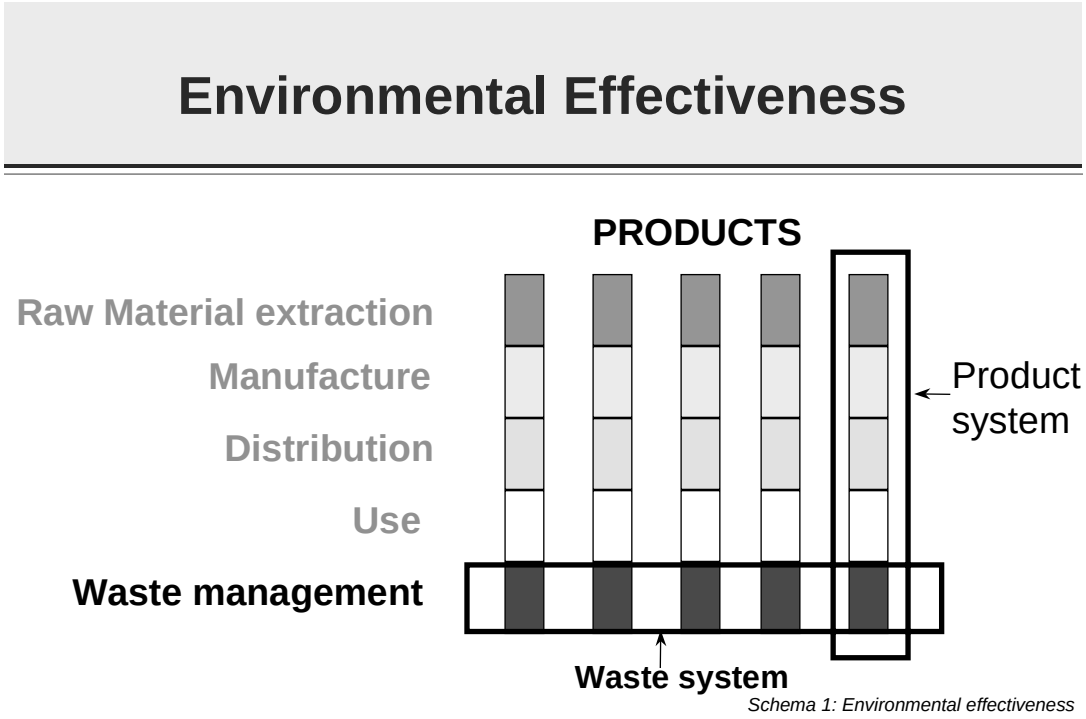
Only local assessments of waste management programs including material recovery processes have provided valid results. These local or regional evaluations look at the entirely of waste streams, within which packaging is just one element. Factors considered include waste generator, demography, consumption patterns, geography, infrastructure, etc… Packaging is never looked at separately.

The need to plan integrated waste management systems on a regional or local basis is gradually being realised by most authorities. Tools such as Lifecycle Inventory are being developed for use in helping to plan such systems in the US (by the EPA) and UK (Environment Agency). Other countries like France

also have initiatives to offer similar support in defining the most environmentally effective mix of treatment options for handling specific local waste streams.

Such a waste related evaluation differs from a product or packaging specific evaluation, but the two techniques are complementary.

Figure 1. **Environmental effectiveness**



Schema 1: Environmental effectiveness

As it is a reasonable request that a product placed on the market is environmentally sound and economically successful one can argue that it is a duty of each waste manager to offer environmentally effective and economically efficient waste management solutions.

The role of legislation would hence be to prescribe the minimum environmental standards to be achieved by each waste management entity and provide the guide lines on how to verify such achievements.

Recovery and recycling would in this case become useful indicators of continuous improvements. Because the would be used for improvements within countries, rather than comparisons between countries, the issue of non-standard date collection and interpretation is not important.

Among possible alternative measurements or improvements to current approaches, let us point to two interesting concepts used by some of European Union Member States:

1. The measurement of packaging waste present in final disposal.
   This measurement gives the net result of all measures taken to limit packaging going to final disposal : prevention as wall as recovery.
   It is used by Austria (2) and the Netherlands (3).

2. The measurement of population covered by appropriate separate collection and recovery of used product and packaging. (Indeed packaging specific collection seldom exists except for glass, -

the separate collection will cover materials much more than products or packaging). This is used in the licensing of most material valorization schemes (4-5).

Monitoring of results 94/62/EC

By 1st May, 1999, fourteen of the fifteen European Union Member States have implemented at least parts of 94/62/EC in national legislation and all are expected to report no later than 1st July, 1999 on data permitting the evaluation of the directive implementation for 1997.

Data requirements are set by Annex III of the Directive as well as a commission decision (97/138/EC) defining the formats to be used for data reporting. (6)

Whilst these requirements provide a fair description of what should be reported on by the Member States, they do not prescribe how the data are gathered and verified.

A 1998 survey conducted for the European Commission DG-XI (environment) (7) identified that at least three different estimation methodologies are currently used by Member States for the evaluation of the amount of packaging placed on the market. This use of different methods has a clear impact on the comparability of data at the European level. Issues related to the definition of what is packaging further limits comparability of reported figures.

For packaging recovery and recycling the values are even less reliable or comparable as definitions and measurement methodology vary.

Besides the above mentioned study (BIPE-Ademe), several other studies have confirmed the scarcity, unreliability and lack of comparability of Packaging and Packaging Waste data.

One of these studies (an ERRA sponsored Price Waterhouse/Coopers survey) concludes (8) :

"One of the findings of this study is that data on the amount of waste, packaging waste and recycling is hard to get, ambiguous and not comparable".

The conclusions of such studies question:

1. The enforceability of Member States legislation implementing 94/62/EC. Indeed, if measurements are of such systematic inaccuracy, the resulting data will at best be a useful indicator but not and not form an irrefutable proof of the achievement of a mandated target. This is specially problematic when penalties are linked to the non achievement of the target.

2. The ability with current information to identify differences in results between shared and producer responsibilities.

The question is thus : Is there a better method for assessing the Packaging and Packaging Waste Directive results ? What could be recommended that would provide all involved parties with more reliable achievement monitoring.

The evalutation of products and material recovery - The concept of optimal recycling

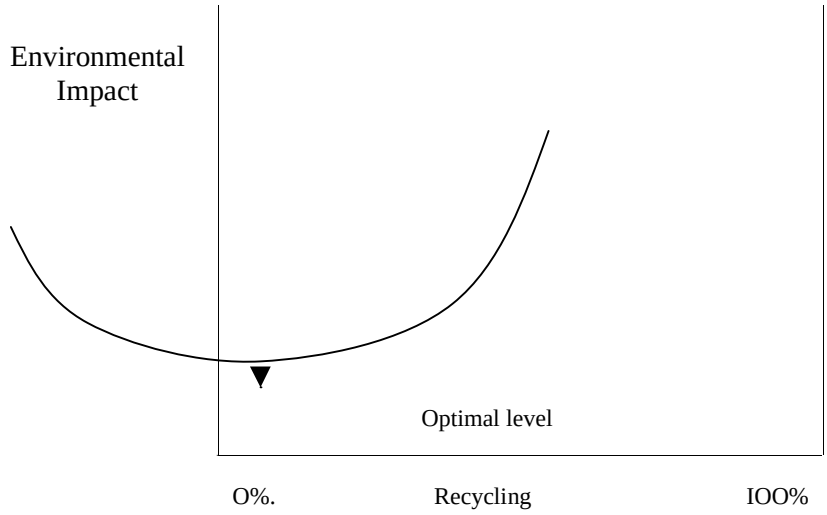
Besides the local factors outlined before that allows decisions to be made on the optimal local integrated waste management system and hence the local optimal material or product recovery, there is the need to

ensure that the locally collected products and materials will find the required markets that ensure their actual use in a new product in an environmentally efficient way.

Contrary to common wisdom, above a certain level, recycling is often not for most materials, the environmentally preferred option.

Boustead (9) and other authors (10) have described the optimal level of recycling, as per the following figure:

Figure 2. **Optimal level of recycling**



As described previously, this optimum will depend on several local, regional or even world wide factors such as volume and quality of material available on a specific market, availability and type of recovery facilities, transportation facilities and means available, secondary material market available, etc…

Discussion

The Packaging and Packaging Waste Directive has generated a high visibility to the issue of packaging usage and recovery.

This has generated multiple activities and an overall improvement of the understanding of the role of packaging and its possible recovery (reuse, recycling and energy recovery).

This has also allowed evaluation of the performance of the initially chosen targets and their monitoring.

Current experience does not support the sole use of recovery and recycling rates and related targets. It points to the complexity of each national situation and the multiplicity of factors to consider. Further more it has highlighted that the monitoring of current targets achievements are difficult if not impossible in an efficient and comparable way.

As this is the time to take a critical look on the cost and benefit relationship for this particular piece of legislation, it appears that such assessments can only be done validly in a bottom up process gathering local costs/benefits analysis results.

Current experience point as well to the use of multiple indicators to allow the measurement of continuous improvement in the field.

This experience demonstrates as well, once the process is launched, that mandatory targets will not be controllable and could not allow the implementation of optimal recycling rates.

What also appears from the 5 years evaluation of the implementation of 94/62/EC is that the aims of the directive can only be achieved by the implementation in the field of a shared responsibility of all actors. As discussed at the recent EU Commission organized Workshop on Integrated Product Policy (11).

“Extended Producer Responsibility aims to shift responsibility for the environmental problems/impacts associated with products along the different stages of the products life-cycle, across all the actors involved in a given product”.

Such an approach requires not one but several indicators, including recovery and recycling rates but not limited to these and not ruled by command and control mandatory targets.

Conclusion

The monitoring of the performance of the European Union Directive on Packaging and Packaging Waste Directive (94/62/EC) allows for the first time a full scale evaluation on how to measure performance of products or packaging specific environmental legislation.

While the current results need to be confirmed in the following years, they establish the variability of situation and hence optimal usage and recovery as well as the need to use several monitoring devices in a continuous improvement approach.

This as well as the implementation reality calls for the joining of forces of all involved in the life cycle of a product and its packaging.

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POWERPOINT PRESENTATION (W. Brinkman and J. Fonteyne)

OECD Workshop
Paris - 4 / 7 May 1999

Extended Producer Responsibility Monitoring Performance

W. Brinkmann, J. Fonteyne
European Recovery and Recycling Association

Extended Producer Responsibility - Monitoring Performance

The lessons of the European Union
Packaging & Packaging Waste Directive - 94/62/EC
Outline of presentation

- **The Directive and its implementation**
- **The evaluation of product and packaging specific waste legislation**
- **Monitoring of 94/62/EC results**
- **The concept of Optimal Recycling**
- **Conclusions**

The P&PWD - 94/62/EC Packaging and Packaging Waste

Key features

- Dual objective: harmonise packaging and packaging waste national measures in order to:
  - prevent/reduce environmental impact
  - ensure functioning of internal market
- Principle of shared responsibility
- Key elements:
  - prevention
  - reuse
  - recovery and recycling (quantitative targets)
  - packaging essential requirements to guarantee free movement within the European Union
  - Monitoring / information requirements

The Packaging and Packaging Waste Directive Member States Legislation Implementation

Status 28/04/99	Recovery and Recycling	
	Responsibility	Targets
Austria	Producer	Higher
Belgium	Producer	Higher
Denmark	Shared	Not in line
Ireland	Producer	Higher
Spain	Shared	In line
France	Shared	In line
Germany	Producer	Higher
Greece	Shared	Higher
Italy	Shared	In line
Luxembourg	Producer	In line
Netherlands	Shared	✓ (Higher[1])
Portugal	Shared	In line
Finland	Producer	Higher
Sweden	Producer	Higher
U.K.	Producer	In line

✓ indicates that the Directive is translated correctly
[1] Negotiated agreement of December 1997

Implementation of the P&PWD Division of Responsibilities

PRODUCER - COSTS COVERAGE

Producer pays full cost + 10% overhead	Belgium
Producer pays full cost	Germany, Austria
Producer pays additional cost	France, Spain
Producer pays recycling cost	Netherlands
Producer buys its quota of secondary material	UK

Implementation of the P&PWD Division of Responsibilities

THE "PRODUCER"

PRODUCER = entity placing packaging on the market
⇨ Be, D, A, NL (law), F

PRODUCER = packaging chain
⇨ UK, NL (covenant)

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Implementation of the P&PWD
Division of Responsibilities

LOCAL AUTHORITIES

	Belgium	Germany	France	Netherlands	UK	Sweden
Obligation to collect	YES	NO	YES	YES	YES	NO
Legal obligation related to packaging	NO	NO	YES	YES	NO	NO

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The P&PWD - 94/62/EC Packaging and Packaging Waste
Product specific legislation forerunner

	Approval	Implementation in the Member States legislation	Revision
94/62/EC	31.12.94	30.06.96	01.07.2001
End of life vehicles	Pending	-	-
Electro-electronic equipment	Pending	-	-
Portable batteries	Pending	-	-

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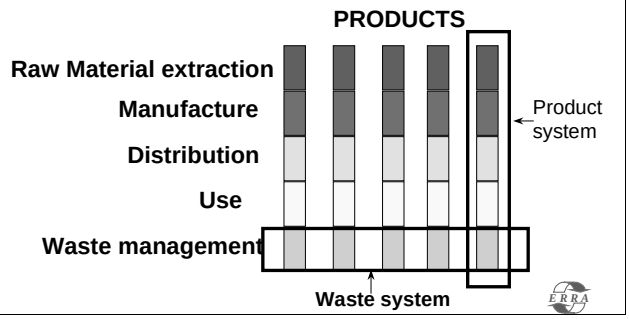
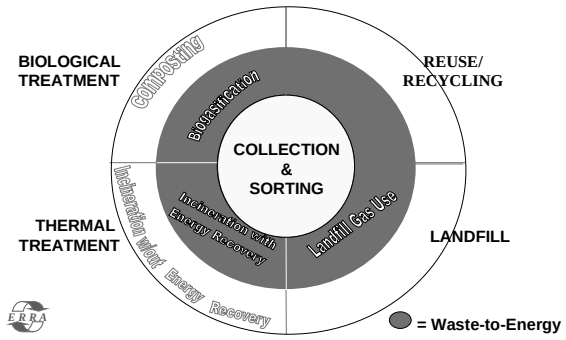
Environmental Effectiveness



Local Assessment of Waste Management Programmes

There are a number of different waste treatment and disposal strategies available which can form an integrated waste management policy. These are represented in the diagram below. The environmental impact of different alternatives can be realised by the management of the programme.



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Evaluation of the Amount of
Packaging Waste in Final Disposal

Austria - 1994

Packaging Material in tonnes	Quantity placed on the market	Quantity in final waste*
Glass	275,064	12,850 to 22,500
Paper and Board	428,681	73,500 to 102,700
Plastics	210,530	104,800 to 135,200
Composites	65,000	36,400 to 47,400
Metals	115,723	17,200 to 31,900
Total	**1,094,998**	**245,000 to 340,000 Versus calculated amount of 607,000**

NB: * = the reported "from-to" range gives the interval where the probability of exact result is 95%

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P&PWD Revision - National Coverage

A case study: Belgium - End 1998

1. 6.3 million inhabitants participate to separate collection "intensifed project" (5 materials) out of a total population of 10.192 million inhabitants (62%)
2. About 90% of the population participate to 1 or 2 materials programme.
3. 41 "Intercommunales"

   32 have signed contract with FOST Plus (80%)
4. There are 589 communes in Belgium, 418 participate through their intercommunales to separate collection (71%)

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94/62/EC Recovery and Recycling Targets

Member States Implementation: Targets

- **11 Member States with targets for all packaging within directive ranges : Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, UK**

BUT:
- Finland has specific materials targets
- France has 2003 targets exceeding directive's for household packaging
- Germany has specific materials targets for household packaging exceeding in total the directive's requirements
- Netherlands covenant targets exceeds the directive's targets
- Portugal requests 100% recovery for beverage containers in Horeca sector

- Four Member States have higher targets:
  - Austria: approved
  - Belgium
  - Denmark (higher targets for transport packaging and non refillable beverage packaging)
  - Sweden: specific set of objectives

- Specific revision clause in Austrian, Belgian, Italian and Greek legislation
- Revision in progress in the UK

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94/62/EC Recovery and Recycling Targets

Member States implementation: penalties

Country	Penalty for non achievement
Austria	Minister can enact restriction on trade and distribution
Belgium	1. Interregional cooperation agreement: ‣ € 496 / tonne of waste not recovered ‣ € 744 / tonne of waste not recycled 2. Ecotaxes law Implementation of ecotaxes of € 0,36 per beverage container
Finland	More specific penalties outlined in waste Act. Ministry can set restrictions on a product, production, import, trade, distribution or use of a product. Economic sanctions, including fines for non-compliance of Waste Act.
Germany	Cancellation of exemption from take back at the store if collective systems do not reach targets
Greece	Imprisonment up to 3 years, fine from 100,000 Drs to 50 million Drs
Ireland	After conviction, fine up to € 1,905 and /or imprisonment up to 12 months
Italy	Economic sanction will be applied including fines proportional to shortfall against targets
Luxembourg	Imprisonment between 8 days and 6 months and/or fine between € 62 and € 123,947
Netherlands	Fines for non compliance of regulation targets (lower than covenant and currently achieved).
Spain	Economic instruments or other measures may be established when any packaging material does not reach minimum 15% recycling targets.
UK	Fine for an individual complier to fail to take reasonable steps to recover/recycle enough packaging waste to meet his obligations.

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The P&PWD - 94/62/EC Packaging and Packaging Waste

Monitoring requirement - Formats defined by 97/138/EC

- Qualitative requirements: heavy metals content - every 5 years
- Quantitative requirements: specific formats - every year as of 1997 (18 months after end of year)

Key data required:
- Quantity placed on the market:
  - production + import - export
- packaging waste arising within Member States and **managed**
  - within Member States
  - outside Member States
- Packaging waste arising outside Member States and recovered within Member States
- Reuse (on a voluntary basis)

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P&PWD 94/62/EC Recovery and Recycling Targets

Current results: réf. PwC study, October 1998

Rates	Recycling	Recovery	Year
Austria	48	52	1997
Belgium	62[1]	X	1997
Denmark	41	83	1994
Finland	29	X	1995
France	29[1]	45[1]	1997
Germany	86[1]	92[1]	1997
Greece	25[1]	25[1]	1996
Ireland	18	18	1995
Italy	31	34	1996
Luxembourg	33[1]	33[1]	1996
Netherlands	55	100	1997
Portugal	3	15	1998
Spain	21[1]	X	1997
Sweden	X	X	X
U.K.	26	X	1997
TOTAL	X	X	X

N.B.: [1] relates only to household packaging

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Evaluation of the Amount of Packaging Waste in Final Disposal

Reported Packaging Usage per inhabitant

Belgium	137 kg ←
Netherlands	178 kg ←
Germany	167 kg
France	171 kg
Luxembourg	200 kg ←
Total Europe	**166 kg**

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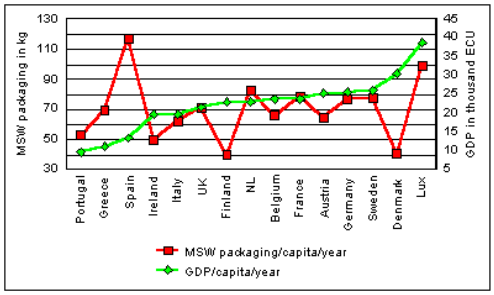
Comparison of MSW packaging and GDP per capita per year by Member State



94/62/EC Recovery and Recycling Targets

Current Results: reliability

PwC (1998):
"… data on the amount of waste, packaging waste and recycling is hard to get, ambiguous and not comparable…. Differences between data are such that no enforcement of recovery and recycling targets can reasonably be expected"

BIPE-Ademe 1998:
Current national approaches are not harmonised (data collection, definitions, calculation methods, etc…)

94/62/EC Recovery and Recycling Targets

Is there a better Method?

- **CURRENT FINDINGS**

1) Avoid national or EU wide ratios

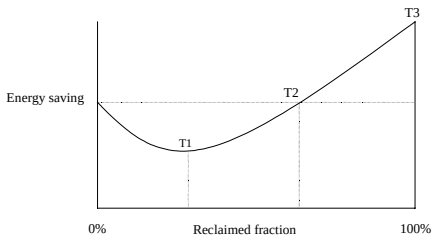
2) Monitoring has to address a mature national coverage of recovery programme.

3) Overall waste management measurement are more available and reliable than packaging specific.

4) Can Targets achievements be mandated or should they be an indicator of environmental impact reduction? - of continuous improvement?

Optimal Recycling

Environmental Evaluation



T1 : reduce energy consumption

T2: same materials but not use more energy

T3: save material without any energy consideration

Réf.: I. Boustead - 3rd CESIO surfaltants Congress - London - June 1992

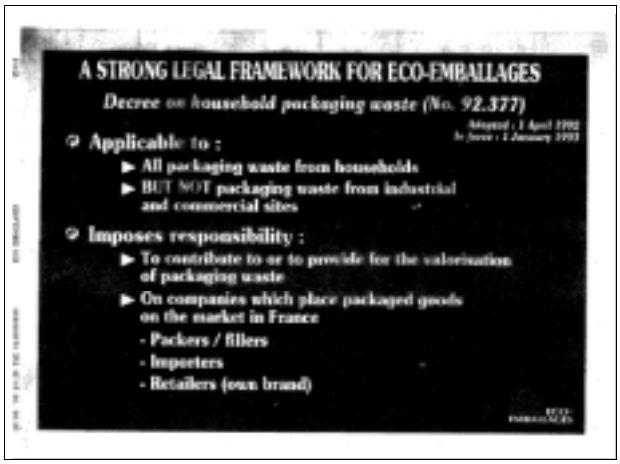
Monitoring of Performance of 94/62/EC

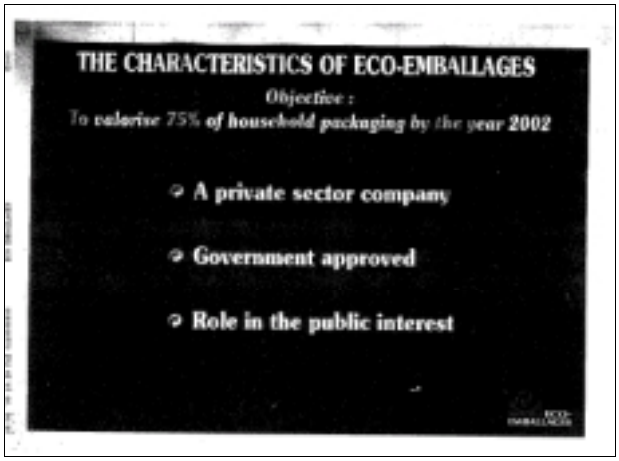
- Variability of field situation renders mandatory targets not enforceable.
- Implementation is calling on the co-operation of all actors in implementing legislation: sharing of responsibilities and results.
- Local most appropriate environmental, economic and social waste management is required.
- Current monitoring concept has to be improved.

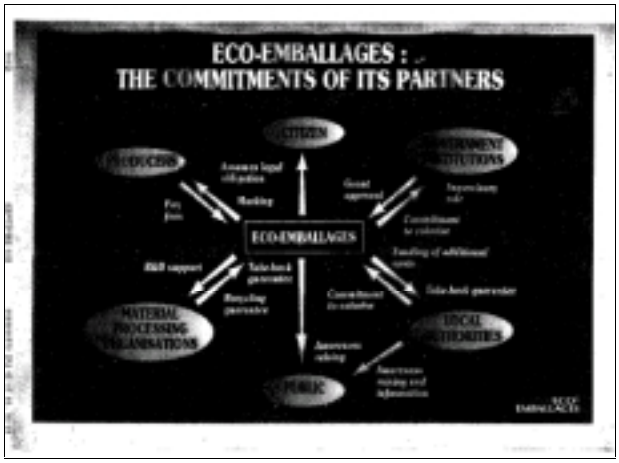
ECO-EMBALLAGES: THE FRENCH SOLUTION

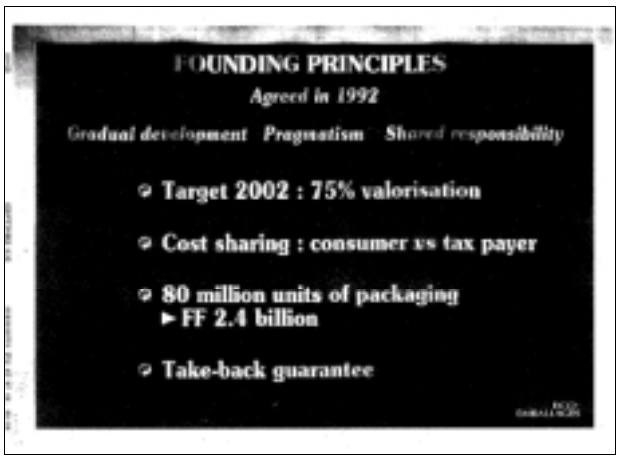
Powerpoint Presentation
by
Bernard HERODIN
Eco-Emballages, France

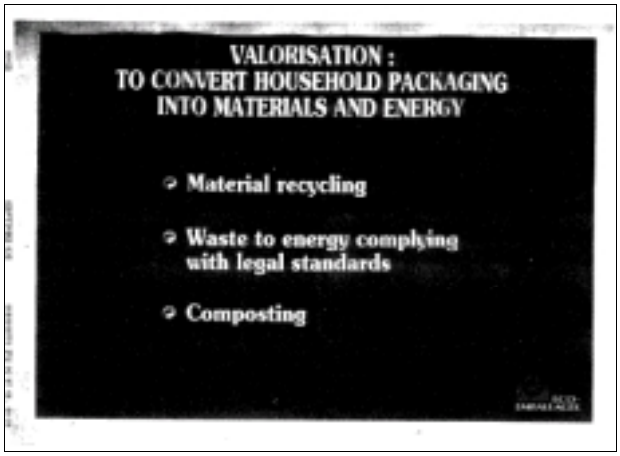
EPR SESSION: 5

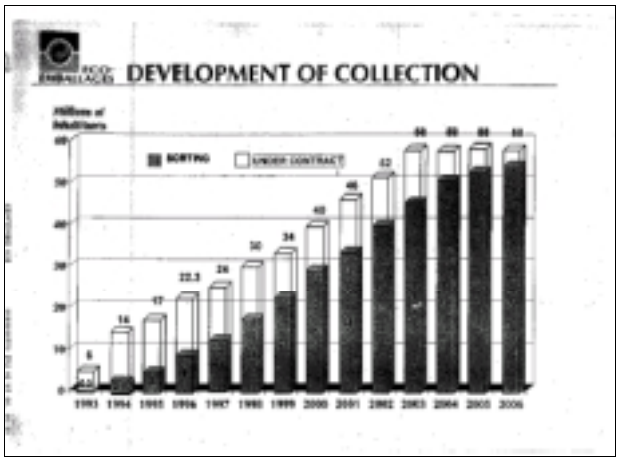


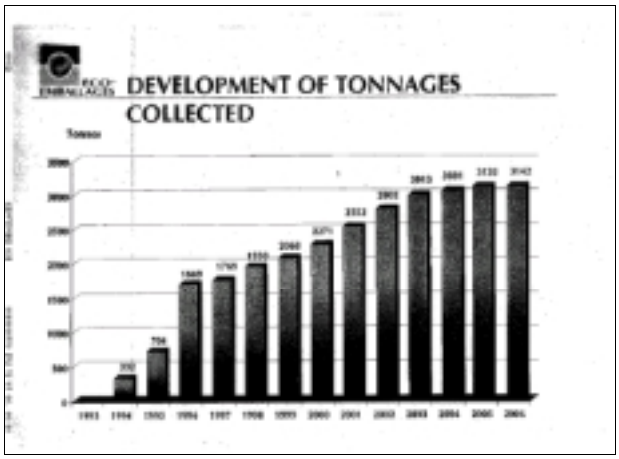


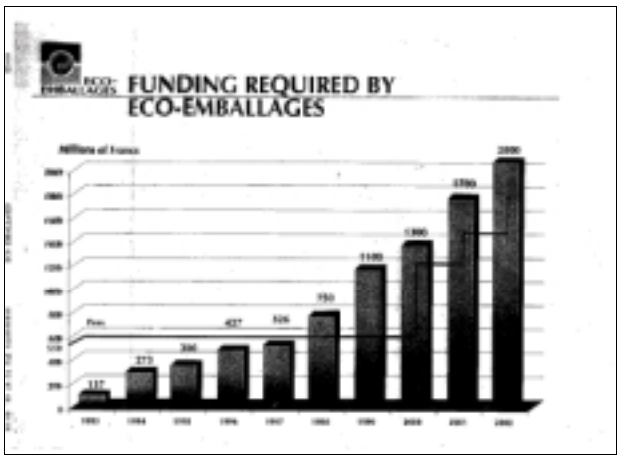


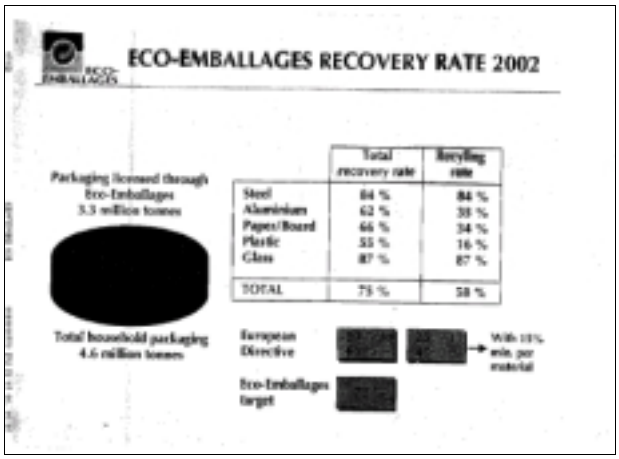



VALORISATION :
TO CONVERT HOUSEHOLD PACKAGING
INTO MATERIALS AND ENERGY
Material recycling
Waste to energy complying with legal standards
Composting


DEVELOPMENT OF COLLECTION


DEVELOPMENT OF TONNAGES COLLECTED


FUNDING REQUIRED BY ECO-EMBALLAGES


ECO-EMBALLAGES RECOVERY RATE 2002
Packaging licensed through Eco-Emballages 3.3 million tonnes
Total household packaging 4.6 million tonnes
Total recovery rate
Recycling rate
Steel 84 % 84 %
Aluminium 62 % 38 %
Paper/Board 66 % 34 %
Plastic 55 % 16 %
Glass 87 % 87 %
TOTAL 75 % 58 %
European Directive
Eco-Emballages target

PRINCIPLES FOR APPLICATION OF EXTENDED PRODUCER RESPONSIBILITY

by
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University of Tennessee, USA

EPR SESSION: 5

Introduction

Principles are critical in the development of policy. They represent the highest level of consensus about the direction of policy and provide a guide in developing policy and a means of evaluating the results of implementation. This paper first proposes that Extended Producer Responsibility (EPR) is itself a broad principle for product-oriented environmental policy, which can supplement existing principles, such as the Polluter Pays Principle. Second, the experiences with EPR-based policies and the discussions in the OECD EPR workshops provide the basis for a proposed set of principles for the application of EPR.

Extended producer responsibility as a broad principle for product-oriented environmental policy

Extended Producer Responsibility offers more than take back of end-of-life products. When viewed as a broad principle, EPR provides a much-needed underpinning for policies that seek to improve the environmental performance of products throughout their life cycles.

Product-oriented pollution prevention has lacked an underlying principle to guide policy development. Some have suggested that the Polluter Pays Principle provides such an underlying principle. Since the early 1970's the Polluter Pays Principle, codified by the Organization for Economic Co-Operation and Development, has been the guiding principle for pollution control policies and production-facility-oriented pollution prevention policies. The Polluter Pays Principle, however, is not well suited for product-oriented pollution prevention.

The Polluter Pays Principle states that the polluter should bear the expenses of preventing and controlling pollution to ensure that the environment is in an acceptable state, irrespective of whether these costs are incurred through some charge on pollutant emission or are in response to some direct regulation leading to an enforced reduction in pollution. It was enshrined by the Organisation for Economic Co-operation and Development (OECD) in 1972 as the overarching economic and social principle for promoting efficient resource allocation for environmental protection while protecting free trade.[6]

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[6] The Polluter Pays Principle: Definition, Analysis, Implementation, Organisation for Economic Co-operation and Development, Paris (1975).

In part because of the state of the technology and the level of understanding of environmental systems when it arose, the Polluter Pays Principle has been much more focused on pollution at the facility level. Nearly thirty years of environmental regulations based on the Polluter Pays Principle have focused on controlling the pollution outputs from each individual firm within the product chain without regard to the linkages to other stages of the product chain and the impact of those stages on those individual pollution outputs. While there is nothing in the Polluter Pays Principle that would preclude a product chain approach, it has in implementation resulted in a focus on production facility pollution emissions and single-medium (e.g., air, water) environmental regulations. In its focus on single production facilities this regulatory approach has usually ignored the links between the upstream and downstream environmental impacts in the product chain.

The Polluter Pays Principle has helped in promoting pollution prevention and waste minimization, but it has promoted pollution prevention that is focused exclusively on the emissions from the production process. The rising costs of controlling pollution at the end of the pipe or disposing of waste, as well as the costs of cleaning up past pollution, have encouraged polluters to select the more economical strategy of preventing pollution in their own manufacturing facilities. But sometimes this is done by shifting the pollution to another stage of the product chain, such as by out-sourcing production steps that were once performed in the manufacturer's facility. The focus on production facilities also ignores the impacts caused by end-of-life products.

It is difficult to abandon the view that pollution prevention occurs where the pollution is generated. The pollution prevention concept itself, after all, has only been around for a little more than fifteen years. Since pollution prevention was a natural outgrowth of the closing of the last outlets for cheap waste disposal by end-of-the-pipe regulations (i.e., making the polluter pay more), it is entirely understandable that this focus would predominate.

The Polluter Pays Principle and pollution prevention policies which have focused on production facilities have not been sufficient in creating incentives for producers to address basic choices of materials and product designs which influence the whole life-cycle environmental impacts of product systems. The Polluter Pays Principle does not easily fit situations where the product itself becomes the pollutant in a subsequent life cycle stage, where the product embodies significant pollution from earlier life-cycle stages, or where the use of the product creates pollution indirectly. This has become most apparent in the case of end-of-life products.

The producer of disposable packaging, for instance, may effectively reduce solid waste generation in its own production process, but the packaging is discarded by the purchaser of the product and then disposed of in a landfill by the municipality. In this instance, who is the polluter, the producer of the packaging, the purchaser, or the municipality?

The producer of a laundry detergent may effectively reduce toxic chemical releases from its own production process, but the surfactants selected by the producer to formulate the detergent are frequently made from carcinogenic chemicals that are released into the environment during their production. Who is the polluter, the producer of the laundry detergent or the producer of the surfactant?

The producer of a refrigerator may effectively reduce energy use and waste generation in its own production process, but after the refrigerator is purchased, the energy used by the refrigerator creates far more significant environmental impacts. Who is the polluter, the producer of the refrigerator or the purchaser who demands energy by using it?

These examples illustrate how difficult it is to stretch the Polluter Pays Principle beyond the pollution generated by an individual firm in an individual link of the product chain, although choices made by that

individual firm may result in pollution up and down the product chain. This is especially true for products that are highly complex, being made up of many different materials supplied by many different firms along the product chain.

Attempting to expand the Polluter Pays Principle to deal with the product chain tortures the literal definition of "polluter." In the first example, placing the "polluter" label on the producer of the packaging is not meaningful in the traditional context, since the producer has reduced the pollution from its production process. It is also, perhaps, a little too value-laden to apply the "polluter" label to a firm that is two links in the chain removed from the point at which the pollution enters the environment.

Extended Producer Responsibility, on the other hand, can provide the high-level consensus of a principle for pollution prevention policies that focus on product systems and design for the environment instead of production facilities. Extended Producer Responsibility as a broad principle states that producers of products bear a significant degree of responsibility for the environmental impacts of their products throughout the products' life cycles, including upstream impacts inherent in the selection of materials for the products, impacts from the manufacturer's production process itself, and downstream impacts from the use and disposal of the products. Producers accept their responsibility when they design their products to minimize the life-cycle environmental impacts and when they accept legal, physical, economic or informational responsibility for the environmental impacts that cannot be eliminated by design.

Because it has not been common for producers to extend their responsibility to the upstream or downstream environmental impacts of their products, these environmental impacts have rarely entered into their design strategies. The principle of Extended Producer Responsibility seeks to extend responsibility up and down the chain so that a producer anywhere in the chain has appropriate incentives to be concerned about the life-cycle environmental impacts of the whole product system.

In the United States the President's Council on Sustainable Development and the U.S. Environmental Protection Agency have broadened the principle further to embrace the concept that other links in the product chain (retailers, consumers, disposers) share some of the responsibility for reducing the life-cycle environmental impacts of product systems[7]. As originally postulated the principle of Extended Product Responsibility carried with it the proviso that the greater the ability of the actor to influence the life-cycle impacts of the product system, the greater the degree of responsibility for addressing those impacts should be.

Extended *Product* and Extended *Producer* Responsibility are not incompatible, as some have suggested. Instead, the more robust view is that *Producer* Responsibility is a subset of a broader principle of *Product* Responsibility. Because producers are usually in the best position, technically and economically, to influence the rest of the product chain in reducing life-cycle environmental impacts, Producer Responsibility captures the majority of applications.

The European Commission has recently begun an exploration of Integrated Product Policy, which addresses the whole life cycle of a product[8]. The "Integrated Product Policy Building Blocks" include:

- measures targeted at the innovation of more environmentally-sound products;
- measures aimed at reducing and managing wastes generated by the consumption of products; measures to create markets for more environmentally-sound products;

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7 Sustainable America: a New Consensus, President's Council on Sustainable Development. (Washington, D.C. 1996).

8 Integrated Product Policy: Final Report, European Commission DGXI, (March 1998).

- measures for transmitting information up and down the product chain; and

- measures which allocate responsibility for managing the environmental burdens of product systems.

Each of these types of measures flows from a broad definition of Extended Producer Responsibility as a principle.

I propose that a broad principle of Extended Producer Responsibility encompasses each of these types of measures and that EPR can serve as a sound underpinning for Integrated Product Policy. OECD should consider adopting EPR as a principle to supplement the Polluter Pays Principle to provide support and impetus for Integrated Product Policy.

While there will likely be continued debate over the name of the principle and its precise definition, and especially over the details of implementation, a new principle has clearly emerged. The ground has shifted, and Extended Producer Responsibility captures the essence of this new ground.

Principles for application of EPR

The discussions in the OECD workshops on EPR have helped distill the issues regarding the implementation of EPR, as have the experiences of various governments with the implementation of EPR programs. Based upon these discussions and experiences, I propose that there are at least ten key principles for development of effective EPR-based policies, of which the first three are the most important:

1. *The extension of responsibility should be done in such a way as to create effective feedback to product designers that stimulates the design of cleaner products.*

If EPR is to be a pollution prevention or waste minimization policy it must stimulate the design of cleaner products. In order to do so, there must be some incentive for product designers to design cleaner products. Direct take back, where the producer, itself, would have physical responsibility for taking the products back for end-of-life management, would represent the purest incentive, because the producer would have to arrange the recycling or disposal, deal directly with the technical feasibility, and pay the actual costs. Of course, pure take back does not exist in any of the policies under discussion. Many EPR policies focus on allocating the general financial responsibility for end-of-life management to a pool of producers and retailers. Where the magnitude of that responsibility is not related to the actual costs of end-of-life management of different product designs or different product materials, the policy is not effective in stimulating cleaner product design.

The German Packaging Ordinance is an example of an EPR policy which varies the costs according to the actual costs of recycling. This feedback to packaging designers has reportedly resulted in dramatic reductions in packaging weight and in a dramatic shift of materials for packaging to those which are the most readily recyclable. On the other hand, EPR policies with uniform costs for all types of product and materials have not produced significant source reduction or changes in the product designs to facilitate recycling.

Where the responsibility for end-of-life management is invisible or remote to the producer, there is little incentive to design cleaner products. For instance, where advance disposal fees are collected at the point of retail by the retailer uniformly on all products in the product category, the producer gets very little, if any, feedback for cleaner product design. Some proposals call for a general producer responsibility to be fulfilled through an insurance policy. While this is laudable as a means of covering the management of

orphan products, it would likely result in a uniform premium for the producer, which would be unrelated to the costs of end-of-life management.

2. *The policy should take a life-cycle approach, and be directed at producing life-cycle benefits, even if it focuses on end of life, so that environmental impacts are not increased or transferred somewhere else in the product chain.*

The OECD definition of EPR focuses on end-of-life management of products, but if EPR is to be effective as a *pollution* prevention or product policy, it should produce overall life-cycle benefits. EPR policies should at least not transfer environmental impacts to another stage of the life cycle by increasing recycling and causing the substitution of materials. On the other hand, the life-cycle focus of EPR should not be used to impede policies that will clearly produce end-of-life benefits as a result of paralysis by analysis. Nor should a life-cycle focus dilute the allocation of responsibility to the point where it is not recognizable.

3. *There should be a well-defined locus of responsibility, so that the responsibility is not diluted out of existence.*

If the responsibility for the management of the environmental impacts of products is already allocated properly to produce the optimum result, then there is no need for an extension of that responsibility. Extension of responsibility, by its very terms, implies a reallocation of responsibility to a part of the product chain which has the greatest ability to reduce the life-cycle impacts of the product system through its actions, but currently bears insufficient responsibility for those impacts to provide a strong incentive to do so.

There is no EPR system which places all of the responsibility on the producer or in which some of the responsibilities are not shared. Therefore, there is no real reason to debate the question of shared responsibility. There are always roles for, and in many cases, costs born by, distributors (retailers), consumers, and waste managers. Attempts to spread that responsibility too far, however, can result in the responsibility being diluted out of existence and can destroy any feedback to the product designer. There must be a well-defined locus of responsibility within the chain of commerce in order to preserve the incentive for cleaner product design.

4. *The policy should be tailored to the specific attributes of the product system being targeted.*

Each product system is different in terms of the number and geographic distribution of producers, distributors, and consumers; the relative importance of end-of-life management as an environmental impact in the product life cycle; the ability of the producer of the final product to influence design decisions for the product system; the influence of the retailer in the product chain; the life of the product; the value of the product at the end of life; and the cost and feasibility of improving end-of-life management. Each of these factors influences the design of an EPR-based policy.

For instance, packaging is produced by hundreds of packaging producers, filled by thousands of product producers, distributed by several hundred thousands of retailers, and used and discarded by hundreds of millions of consumers every day. For the packaging life cycle, the packaging producer typically has more influence over the design decisions which determine the ease of recycling at the end of life than the producer of the product who fills the package. The retailer may also be influential, because there are large retailers who have significant influence over product specifications. The role of the consumer is critical in recycling the packaging, and the packaging has little value at the end of life. These attributes make packaging a difficult product system for an EPR-based policy aimed at influencing design decisions. The expense of creating a separate collection system given the volume of packaging has been cited as one problem with EPR for packaging. With so many actors in the product chain the allocation of responsibility

becomes critical, and an attempt to share responsibility among too many actors can become a bureaucratic nightmare. With so many actors, free riders also become more of a problem.

The automobile, on the other hand, is produced by a few large companies with sophisticated designers. The distributors have relatively little influence in the design decisions. While there are many consumers, the number of times which a consumer deals with the automobile at the end of its life is few. The long life of the product also makes the question of dealing with the existing stock of products and orphan products important. The value of the product at the end of its useful life also means that the market is more likely to evolve an effective end-of-life management scheme.

5. *The extension of responsibility should be done in such a way as to increase communication among actors in the entire product chain about the life-cycle impacts of the product.*

Communication among actors in the product chain about the life-cycle impacts of the product chain is critical in providing the basis for mitigating those impacts. An EPR scheme should enhance that communication, so that product designers get meaningful feedback about the impacts of their design decisions, so that material suppliers understand the technical and economic issues in recycling their materials, so that waste managers are aided in disassembly of products and selection of technologies, and so that consumers know their roles in the EPR scheme and the effects of their product choices. This enhanced communication can aid in identifying problems and adjusting the implementation of the EPR policy

6. *The policy should stimulate innovation by a focus on results more than the means to achieve the result, thereby providing flexibility of implementation to producers.*

Product innovation for cleaner products is one of the goals of EPR. Innovation is encouraged more by flexibility in the means of achieving the desired results than by a prescription of those means. Furthermore, flexibility allows the market to provide the lowest-cost solution.

7. *There should be a means of assessing the environmental and economic results of the application of the policy and for modifying the policy to correct problems in implementation.*

While balancing data needs with the costs of obtaining the data, an EPR policy should contain a means of assessing the environmental and economic results. Flexibility in the implementation of the policy should be provided in order to make mid-corrections if the policy proves ineffective or too expensive.

8. *There should be balanced stakeholder input in the design of a EPR policies, including input from all links in the product chain.*

Stakeholder input is critical in designing an EPR policy, not just in sustaining the legitimacy of the policy, but also in gaining sufficient understanding of the product chain to allocate responsibility appropriately. Stakeholder input may also lead to the use of voluntary measures instead of more intrusive mandatory measures. Finally, stakeholder input can help build communication and cooperation among links in the product chain which can lead to better implementation and innovative product design.

9. *Voluntary measures should be considered, and if adopted, should at least include effective monitoring of results with the possibility of more intervention if the voluntary measures do not achieve policy objectives*.

Once a government has decided that environmental goals and targets are necessary for a class of products, the opportunity to achieve those goals and targets through voluntary adoption of EPR by producers should be considered. Voluntary measures without effective monitoring, however, are not likely to achieve those

goals and targets. For voluntary measures to succeed, there must also be the understood possibility that greater government intervention will occur if they do not.

10. *The design of EPR policies should involve considerations of market creation and consumer behavior.*

EPR as a means to increase recycling should always consider the necessity of enhancing the markets for recycled materials. Furthermore, for consumer products, understanding consumer behavior is crucial. Consumers should also be educated about the EPR policy and their roles in its implementation.

Conclusion

When viewed as a broad principle, Extended Producer Responsibility can serve as the bridge between waste minimization policies and product-oriented environmental policies. It is clear that EPR is more than just take back and that it describes a rich set of policies which can stimulate the design of cleaner products from a life-cycle approach. Such policies are the next step in support of environmental sustainability. Because EPR policies are new, lessons from their implementation are still being learned, and the process of learning will likely lead to the elaboration of further principles for effective implementation.

PRODUCER RESPONSIBILITY: A PAPER BY THE UK DEPARTMENT OF TRADE AND INDUSTRY

by
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Introduction

This short paper identifies and discusses some of the issues that need to be considered when designing a Producer Responsibility policy. It is based largely on UK experience in implementing a Producer Responsibility policy in a number of sectors - through voluntary action in the vehicles, tyres, batteries, newspapers and electrical and electronic equipment sectors, and through legislation in the packaging sector. The paper focuses on the choices to be made when building a legislative framework, although much of the analysis is also relevant to voluntary Producer Responsibility initiatives. The paper does not seek to compare the advantages and disadvantages of a Producer Responsibility policy with other policy options.

What factors influence the choice between a voluntary approach, legislation and/or economic instruments?

Producer Responsibility initiatives should motivate companies to take action to reduce the impact of their products on the environment at end of life, for example by increasing reuse and recovery rates. Producer Responsibility initiatives should aim to address a market failure. An example is where the rate of recycling is below the social optimum because not all relevant environmental costs are reflected in market prices and/or because the full costs of disposal do not feed back to producers so that the designs of goods are not optimal.

Governments may encourage voluntary action, or may introduce legislation and/or economic instruments. Voluntary approaches tend to offer more flexible and low cost solutions, but they can be undermined when cost advantages are exploited by non-participating companies. The factors which would help to make a voluntary approach successful include: a history of co-operation between companies; a strong trade association with comprehensive membership; an industry for which public perception/approval is important; an industry where there are large, visible firms or only a few firms. A voluntary approach is also likely to be successful where the desired activity is profitable and the main market failure is a lack of information or awareness of best practice - in this case, an information campaign may be all that is needed.

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Legislation may be justified where there is clear evidence that a voluntary solution would be unlikely to achieve the environmental benefits sought, and where the environmental benefits of the legislation are likely to outweigh any social (including financial) costs. The advantages of legislation include greater certainty that the political and environmental goals sought will be achieved and less likelihood of individual companies "free riding" and thereby gaining an "unfair" advantage over their competitors. In addition, harmonised legislation at a European Community level aims to ensure the functioning of the Single Market and to avoid barriers to trade between EC member States. Member States may then need to implement national legislation to ensure that they meet the objectives and obligations of the EC legislation.

Economic instruments, such as tradable permits, have the potential to be a cost-effective way of achieving environmental objectives. For example, where an industry is diverse, and there are numerous firms with different cost structures, so that the costs of taking action vary widely between firms, tradable permits may allow firms which can reduce their environmental impact cheaply to do so and then sell their "excess" reduction to firms for whom abatement is more expensive. Similarly taxation allows firms which can abate cheaply to do so whilst other firms can choose to pay the tax (and hence pay the full cost of the environmental impact).

Which producers should be responsible?

The main choice is whether to identify a single point of responsibility in the production and distribution chain, for example the product manufacturer or retailer, or to share responsibility between a number of parts of the chain. A single point approach has the advantage of simplicity. It may be perceived as being less fair than sharing responsibility throughout the chain, although, in practice, costs may be distributed according to market power irrespective of where the legal obligation is placed. A single point of responsibility may also be less effective than sharing responsibility if the participation of all parts of the production and distribution chain is desirable in order to achieve the objectives at least cost (for example because some parts of the chain have greater access to waste and others have more scope to change the design of the product). On the other hand, the effects of competition and normal commercial relationships between suppliers and customers may go some way to creating the conditions in which it is in the interests of all parts of the chain to participate even when the obligation is placed on only one party.

In principle, any party could be made responsible. For example, in the case of packaging, the responsible party could be the raw material manufacturer, the packaging manufacturer or converter, the packer/filler or the retailer, in addition to the equivalent importer. A number of factors should be taken into account in deciding who to make the responsible party, including the influence which each point in the chain has on product design, the number of firms at each point in the chain, and the ease of monitoring imports and exports.

The key factor is identifying the party which has most control over the design of the product. Targeting the product designer or specifier is most likely to lead to immediate changes in product design. The changes which they will be motivated to make will depend on the form of the producer responsibility obligation, but they could include, for example, improvements in lightweighting, design for dismantling and recycling, and incorporation of recycled material as a feedstock in the production process. Identifying the party which has most control over product design may not be straightforward; more than one company in the production and distribution chain is likely to have an influence, and their relative influence might vary from sector to sector. In some sectors, retailers for example have a considerable influence over their suppliers, as well as specifying the design of their "own brand" goods.

Other factors will also be important. For example, one factor is the number of firms at each point of the production and distribution chain. If there are many firms at one point of the chain, there may be

disadvantages in targeting this point since the total enforcement and administration costs are likely to be relatively high (although the cost per company is likely to be relatively low).

Another factor is the ease of monitoring imports and exports. Assuming exports are to be deducted from a company's obligation, this will be most straightforward if the obligation is placed at a "downstream" point in the production and distribution chain. "Upstream" companies, such as raw material manufacturers, will find it more difficult to estimate how much of their output is incorporated into products which are eventually exported. Capturing imports will be best facilitated by targeting retailers. If "upstream" companies are targeted instead, products imported by their customers will be missed unless these "downstream" companies have a separate obligation for the products which they import.

An alternative to single point responsibility is to share the responsibility between a number of parts of the production and distribution chain. This has been the approach taken in the UK's only Producer Responsibility legislation which covers the packaging sector. The UK Packaging Waste Regulations share the obligation between raw material suppliers, packaging manufacturers/converters, packer/fillers and retailers, as well as the equivalent importers. This approach was adopted in response to consultation with industry which is a vital process in framing any Producer Responsibility policy.

The shared approach may be perceived as being fairer than targeting a single party. It may also be more effective since it assures the participation of all sectors and raises their awareness of the environmental impact of their activities. A direct legal obligation on each sector is likely to increase companies' motivation to make the changes within their control by making the costs of complying with legislation more visible to them. For example, packaging manufacturers and packer/fillers specifying and designing packaging may be motivated to increase the proportion of recycled feedstock used and to seek further reductions in the amount of material used, and retailers may be motivated to increase the proportion of waste on their premises which they collect for recycling. On the other hand, this solution will inevitably be more complex and the administration and enforcement costs will be higher.

What should producers be responsible for?

One option is to specify precisely the activities which the producer must undertake, for example to specify that the producer must establish a deposit-refund scheme to provide consumers with an incentive to return their end of life products. This has the advantage of providing producers with certainty about their responsibilities, enabling them to plan with confidence. On the downside, this solution is inflexible, and does not allow producers the ability to choose a lower cost system, if one exists, even if this would achieve the same environmental outcome.

An alternative option is to specify the objective which the producer must reach and to leave them the flexibility to decide how to meet this objective. Where possible, the UK prefers legislation which specifies the objective, and leaves those who are being regulated some freedom to decide how to achieve this objective. For example, producers may be set reuse, recovery and/or recycling targets.

There is likely to be significant difficulty in deciding what legislative objectives to set. The end goal is environmental improvement (for example reductions in emissions of greenhouse gases, reductions in water pollution) rather than reuse/recovery/recycling per se. However, Governments may choose to set reuse, recovery and/or recycling targets in the expectation that these will lead to environmental improvement. They then face considerable difficulty in determining the optimal level at which to set these targets.

Where targets are set, they themselves may be flexible. For example, producers may be set a target for diverting waste from landfill, and may choose whether to meet this target through minimisation, reuse, recycling, composting/biodegradation or energy recovery. Alternatively, the targets may be quite specific.

For example, producers may be set specific recycling targets for each material (metals, plastics, glass and so on). Setting flexible targets is likely to cost less, since producers will be able to choose the cheapest way of meeting the targets. On the other hand, if there is evidence that the cheapest way of meeting a flexible target is not the one which generates the greatest environmental benefits, there may be advantage in setting more specific targets where this is justified by the balance of likely costs and benefits.

There may be more than one way for producers to demonstrate that they have met the targets. For example, they may deliver their own waste to a reprocessor and obtain evidence that the waste has been reprocessed. Alternatively, if they do not have access to sufficient quantities of their own waste, they may buy waste from, say, another company or a local authority, and deliver this waste to a reprocessor. Or they may even approach a reprocessor, without waste, and buy from that reprocessor evidence that a certain quantity of waste (which another party such as a local authority has delivered) has been reprocessed. The UK Packaging Waste Regulations, for example, allow this flexibility, and provided that producers can produce evidence that waste has been reprocessed (for example a Packaging Waste Recovery Note or PRN), they do not need to have handled that waste themselves. This may lead to organisations trading PRNs (which are evidence of reprocessing), as organisations which want PRNs to fulfil their legal obligations buy from organisations (reprocessors and other parties) which have "spare" PRNs. PRNs are thus a sort of tradable permit.

This trading in evidence of reprocessing has the potential to reduce the costs of meeting the targets. With competition in the market to supply evidence, firms are able to choose whom they buy evidence from, and this should help to bring down the costs of meeting the targets. On the other hand, businesses may be concerned about the possibility of parties who do not have obligations under the legislation obtaining and trading in PRNs for a profit. They may be concerned that this will reduce the funding available to reprocessors to increase reprocessing capacity, stimulate increased levels of waste collection and expand markets for reprocessed materials - all activities which need to take place if targets for increasing recovery and recycling rates are to be met. UK companies have expressed these concerns about the operation of the UK Packaging Waste Regulations.

Should producers have a choice between individual compliance and joining a compliance scheme and a choice between schemes?

The UK sees advantages in allowing producers some flexibility to decide how to achieve the policy objectives. This allows them to choose the most practical way of complying. For this reason, we prefer to allow producers to choose between individual compliance and joining a compliance scheme which takes on the legal obligations of its members. Producers who would find it impractical or expensive to become involved in waste management themselves may thus choose to pay a compliance scheme to organise this for them.

The UK also sees advantages in allowing more than one scheme to be established. Again, such flexibility enables producers to choose the best way for them to comply. In general, the UK's view is that competition between suppliers (in this case between schemes) is likely to stimulate greater efficiency and innovation and lead to lower costs. For competition policy reasons, a single compliance scheme, with a monopoly on providing compliance services, is less attractive.

Should producers be responsible for their own products at end of life?

A key question is whether each producer should be responsible for managing the waste from the products which they produced or whether they should be allowed to manage any waste of the same kind in order to fulfil their obligation.

Requiring or allowing each producer to manage waste from their own products gives producers the greatest incentive to improve the design of their products, for example to make them cheaper to recover and recycle. This is feasible if the waste products are readily identifiable and if they can be readily separated from other waste. For example, this is feasible if the producers can establish a system to take back their own products, say by means of a deposit/return system or other closed loop system.

Alternatively, producers may be allowed to manage any waste of the same kind. For example, a computer manufacturer may be allowed to take back and reuse/recover any make of computer in order to fulfil their obligation. This does not give the same incentive to the individual producer to improve the design of their product, but may be administratively simpler and cheaper and more convenient for the consumer whilst still meeting environmental objectives.

Where producers join a compliance scheme which fulfils their obligations on their behalf, the compliance scheme will need to manage waste from a range of products and share the costs between its members. Members may be able to negotiate a reduced fee if they can demonstrate that their products are cheaper to reuse and recover - if this is an option for them, again it gives an incentive to improve the design of their products.

Should smaller producers be exempted?

Smaller companies generally find it more difficult to cope with the burden of legislation. The administrative costs of legislation are also likely to be proportionately greater for them than for larger companies. Exempting smaller companies from Producer Responsibility legislation recognises these factors. It also reduces the total administration and enforcement costs by reducing the number of companies with an obligation. On the other hand, companies which are exempted have a competitive advantage over those that are not, and the more companies which are exempted the greater the burden which the others have to carry in order to achieve the same objective.

Where a decision is made to exempt small firms, the threshold can be worked out on the basis of turnover or tonnage of product placed on the market (or a combination of both). The decision on where to set the threshold is likely to depend on a number of factors, including the complexity of the legislation and the number of companies in the sector targeted by the legislation (both of which affect the administrative costs associated with the legislation). A rule of thumb might be to set the threshold at a level which captures the companies whose products make up around 90% of the total products on the market - but, in the end, the decision on whether and where to set any threshold is a matter of political judgement.

Conclusion

There are many issues to consider when deciding on and designing a Producer Responsibility policy instrument. There will always be advantages and disadvantages with any instrument, and this paper has attempted to identify some of these.

LINKING SOURCE REDUCTION AND EXTENDED PRODUCER RESPONSIBILITY

by
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WASTE MINIMISATION: PLENARY SESSION

The Organisation for Economic Cooperation and Development (OECD) takes an interesting and thoughtful step in combining discussions of extended producer responsibility (EPR) and source reduction (i.e., the prevention component of waste minimization). Both policy strategies aim to improve the environmental character of solid waste management by looking upstream in the product life cycle to production and consumption decisions. It is therefore important to ask how these two strategies relate and how they might be usefully integrated.

I will argue in this paper that EPR is a critical complement to source reduction because it provides individuated (targeted) incentives to producers to engage in design for environment (DfE) related to end of life (EoL) management—to use less material and design for recyclability. I use the very familiar example of packaging to illustrate my argument. In some cases, the incentives arising from EPR can bring about additional source reduction. In others, the incentives help facilitate the recycling of the products that are not amenable to further source reduction.

To make this argument it is important to distinguish between where the environmental *benefits* from source reduction and EPR accrue in the product life cycle and where the *leverage* for achieving those benefits lies. Despite the fact that source reduction and EPR are chiefly envisioned as strategies for improving waste management—or end of life (EoL) management, to express this in terms of product policy—both the benefits and leverage to achieve them lie principally upstream in the production portion of the product life cycle.

The benefits: Reducing upstream environmental harms

A variety of research suggests that the environmental benefits of diverting post consumer waste from final disposal (i.e., from incineration and landfilling) arise not in connection with the environmental effects of solid waste management, but in the upstream or production-related damages that are avoided (Schall 1992, Denison 1994). That is, the benefits source reduction and recycling are not primarily a matter of reduction of releases from state-of-the-art incinerators and landfills,[10] but rather of (1) the reduction of production-related releases (because source reduction has diminished the quantity of materials/products needed),

[10] One important exception to this is the generation of methane from landfills.

(2) the avoidance of damages associated with resource extraction (logging, mining, drilling) when fewer virgin materials are needed and (3) the energy savings frequently obtained when recovered materials and used in lieu of virgin materials[11].

The first and second of these benefits suggest that while source reduction is environmentally beneficial within the waste management system, its most significant benefits occur because less waste generation often entails less consumption and less production. It is for these reasons that I argue that the goal of policies related to post-consumer waste management is to realize these upstream environmental benefits.

The leverage: Design for environment

As argued elsewhere, the power of EPR arises in its ability to provide incentives for the (re)design of products and packages to enhance EoL management (Lindhqvist and Lifset 1998). Because EPR makes producers responsible for post-consumer waste, sometimes even for the literal take-back of products, it provides ongoing incentives for producers to minimize the quantity of materials introduced into commerce and to design for recyclability, re-usability, durability and related objectives in order to minimize their costs. DfE is thus added to the design considerations facing producers. It is done so in a manner that is more direct than the reliance on price signals from the cost of disposal traveling up the product chain from waste generator to consumer to producer.

EPR's capability to generate such specific incentives is a key complement to proposals to improve the environmental performance of infrastructure and related common elements in most product life cycles such as commodity chemicals, electrical power, and transport (Fonteyne et al. 1999). Making transport less polluting, for example, will clearly provide important life cycle environmental benefits for many products; combined with the targeted incentives for DfE that EPR can provide, such a strategy holds out the potential for significant gains.

The Problem: Unit versus aggregate source reduction

Producers have been remarkably successful at reducing the quantity of materials used *per item* (product or package). Famously, the quantity of aluminum or glass needed to produce a beverage container has declined by as much as 40% in the past two decades (Aluminum Association 1999, Glass Packaging Institute 1999). This is a testament to the power of market forces: manufacturers have a clear economic incentive to lower costs by reducing the quantity of inputs (raw materials) that they consume.

Yet, the overall effect of such incentives may be insufficient. Contemporary research on whether the global or national economies are dematerializing presents an ambiguous message. Dematerialization is "the absolute or relative reduction in the quantity of materials used and/or the quantity of waste generated in the production of an economic unit." (Cleveland and Ruth 1999, 16) Dematerialization can be discussed in per capita terms—the quantity of materials used per person—or in terms of economic output—the quantity of materials used per unit of gross national product (GNP). For the purposes of this paper, the differences between these two measures is not important. What is critical is the understanding that such indicators measure *unit effects*. Materials use can decline on a per capita or per GNP basis and still increase on an aggregate basis if the rate of increase in population or economic growth exceeds the gains in efficiency of materials use. As Wernick and his colleagues note in their review of trends in materialization and dematerialization (Wernick et al. 1997, 153).

[11] A significant fraction of the air pollution released in the production phases of the product life cycle are associated with energy consumption. Thus, the energy savings associated with manufacturing using recovered materials translate into reduction of air pollution.

> The tendency [in the economy over time] is to use more scientifically selected and artificially structured materials. ... These may be lighter, though not necessary smaller. The value added clearly rises with the choice of material, but so may aggregate use.

Similarly, Cleveland and Ruth note in their exhaustive review of dematerialization that (1999, 45)

> ...we should view with suspicion any gross generalizations about material use that are drawn from previous work, particularly the gut feeling that technical change and substitution inexorably leads to decreased materials intensity and reduced environmental impact.

Why is this understanding of dematerialization important to debates over source reduction and EPR? Because increased efficiency in the use of materials for packaging, for example, measured on a container or package basis do not capture aggregate affects. There are two ways in which this is important.

First, data on reductions in use of materials per package—the quintessential case of lightweighting—do not capture increases in the number of packages sold. Obviously, as the economy grows, more goods are sold[12] and therefore more packages are used to convey those goods. According to waste characterization information compiled for the U.S. Environmental Protection Agency, post-consumer packaging waste for beverage containers for the period 1980-1996 has declined when measured in terms of packaging/person/year (101 down to 93 lbs) and in terms of pounds of packaging per gallon of beverage conveyed (1.33 down to 0.97 gallons). During the same period, however, beverage consumption increased from 76 gallons/person to 96 gallons and the aggregate amount of beverage packaging waste has increased from 11 461 tons to 12 383 tons. (U.S. EPA 1998a, 101)

Less obviously, independent of matters of economic growth, the number of packages sold may increase if the number of single serving containers increases, especially at the expense of larger volume containers. Simply put, cans and bottles may be getting lighter, but the number of cans and bottles used to convey a particular quantity of beverage is probably increasing. Market forces do not provide clear signals to packaging producers to reduce *this* form of increased materials consumption (and waste generation) in as powerful a manner as such forces signal the economics benefits of lightweighting.

This is where EPR comes in. If the producer (however defined) faces the burden of the management of the discarded container, then the pressure for further source reduction is reinforced, because the producer then bears a portion of the cost of post-consumer waste management[13]. As population and the economy grows, a combination of source reduction and EPR can point us toward sustainability, insofar as these strategies institutionalize incentives to reduce both unit and aggregate source reduction[14]. Dematerialization *per unit* needs to progress fast enough to offset the countervailing increases in population or GNP.

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12 Some growth occurs through the expansion of services and thus there is not a one-to-one correlation between economic growth and material throughput in an economy.

13 Note that if a portion of the costs of waste management are transferred from the waste generator to the producer, then there will be some diminution of the incentives of the waste generator to engage in environmentally preferred activity such as recycling or altered purchasing habits. However, because the costs will be concentrated in the case of the producers (because of the relatively fewer number of actors) and diffuse in the case of the consumer/waste generator, the costs under EPR are more likely to stimulate changed behavior.

14 A more precise analysis of these interacting factors can be found in the research literature on the IPAT equation (Impact = Population x Affluence x Technology). This literature attempts to parse the effects of population growth, changing consumption and technological change on environmental impacts. See, for example, Rosa and Dietz (1994).

Measuring the success of the remedy

Ironically, this discussion suggests that the all too familiar—and acrimonious—debates over the efficacy of the German Packaging Ordinance and other EPR schemes are the right debates to be having. This is because the Ordinance spawned a producer responsibility organization (the Dual System) that has a fee system directly encouraging producers to use less materials (because of the portion of the fee based on weight) and fewer packages (because of the portion assessed on a per container basis). In this regard, EPR stimulates source reduction that, the environmental improvement of waste management infrastructure cannot. Thus, the German system provides a particularly good case study for analysis. We know that the Ordinance produced a notable decline in secondary packaging as well as a broader reduction in overall packaging consumption (OECD 1997). Was this a one time effect? How much of the change in packaging consumption was due to non-programmatic effects such as the reunification of Germany? Have other packaging EPR schemes engendered similar source reduction effects?

Priorities for the next decade

Both source reduction and extended producer responsibility, if well designed, have the potential to increase resource efficiency by tapping the technological and logistical expertise of producers. But most EPR programs are new and little is known about their efficacy. What is desperately needed is more systematic data and analysis of these efforts. Both proponents and critics assess them using anecdotal information; little is transparent to many key stakeholders. In this respect, *better reporting and evaluation is a critical priority*. This is the case whether efforts are voluntary or mandatory (Harrison, 1999). Only then can we known if incentives discussed in this paper have actually been put in place and if they are realizing their potential for environmental improvement.

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POWERPOINT PRESENTATION [Reid Lifset]

Linking Source Reduction and Extended Producer Responsibility

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OECD International Workshops
EPR and Waste Minimization Policy
Paris, France
May 4-7, 1999

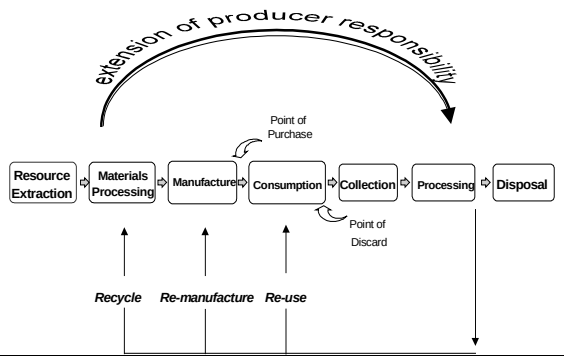
EPR and Source Reduction are Complementary Strategies

- Market forces provide some incentives for SR
- EPR augments those incentives
- EPR addresses EoL problems that SR does not remedy

Location of Benefits versus Leverage

- Benefits accrue *upstream*
- Leverage lies *upstream*
- Activities occur *downstream*

EPR, SR and the Product Life Cycle



Benefits of Source Reduction

Less Waste Generation

Less Consumption

Less Production

Dematerialization

- absolute or relative reduction in quantity of materials used and/or quantity of waste generated in production of an economic unit
- per GNP
  - per capita
- Unit dematerialization occurring for many products and materials
- Aggregate dematerialization - not clear

The example of lightweighting

- Beverage containers decline in weight
  - PET: 24%
  - Aluminum: 44% (20 yrs)
  - Glass: 40% (15 yrs)
- Packaging used to convey beverages declines on unit basis:
  - 25% over 16 years (lbs/gal conveyed)
- Beverages/capita increase: 76 →96 gal/person
- Total beverage packaging consumption increases: 11,461 tons → 12,383 tons

Dematerialization *per unit* needs to progress fast enough to offset the countervailing increases in population or GNP

Priorities for the Coming Decade

- Measure!
- Evaluate!
- Institutionalize!

OPENING ADDRESS

WASTE MINIMISATION, RECYCLING AND WASTE MANAGEMENT IN THE 21ST CENTURY

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I would like to formally welcome you to the OECD workshop. It is my great honor to co-chair the EPR/Waste Minimisation workshop with Mr. Shantora. Originally the Japanese Ambassador to the OECD was planning to give a speech, but unfortunately, he could not come. Here, I would like to give a short speech at the occasion of the opening of the OECD joint workshop. This workshop, which is organised by the OECD, is hosted by the Ministry of Health and Welfare of Japan which has supported the EPR project since 1994 - phase 1-2 and 3. I would like to express my sincere appreciation to all of you who have come to this workshop. This is my fifth opportunity to attend an OECD workshop, including the waste minimisation workshop, Washington D.C. in March 1995 and the EPR workshops held in Ottawa in December 1997, Helsinki in May 1998, and Washington D.C. in December 1998. Gradually, my responsibility in these workshops has expanded. In the last workshop, I presented a paper. This time, my responsibility is the Chairmanship. The rewards have also expanded. I have met more friends, and it is so wonderful to meet you all.

The objectives of this workshop are:

- to provide input to the Guidance Manual being developed for OECD Member governments on implementing extended producer responsibility (EPR) programmes;
- to provide information for an OECD waste minimisation (WM) policy options framework, with strong emphasis on waste prevention; and
- to indicate future directions and the role of EPR/WM policies in the context of OECD work on resource efficiency.

First, I would like to start by reviewing the waste management practices and facing the problems they cause. Waste is generated as a result of living in good conditions. We need fresh water, fruit, drinks and all kinds of food to lead a healthy life; but they all come in containers and packages. Also we need magazines, newspapers, TVs, refrigerators, washing machines, air conditioners, and many more, in order to be able to enjoy life comfortably. But those will become household waste sooner or later.

The generation of waste should be controlled at the source by households and business enterprises, where the waste originates. Recyclable components of such waste are disposed of separately, to facilitate

recycling. Municipalities and waste disposal agents, both of which dispose of waste, sort out useful components from the collected waste and put them in a recycling route. In some cases, material recovery is not an appropriate measure because of the technical and/or economical difficulty involved, accordingly, volume reduction by intermediate treatment like incineration should be promoted as a measure to prolong the remaining service lives of landfill disposal sites, and the energy derived from the incineration should be used for resource conservation. The residue of intermediate treatment is then subject to the environmentally sound final disposal.

"Waste minimisation", "waste prevention"or "waste reduction" is a concept widely used as the most desired method of waste management. The well-known "3R" (Reduce, Reuse & Recycle). This 3R hierarchy puts waste reduction at the top of waste management options. In Japan, also, waste minimisation has been recognized as the first policy objective in order to achieve better waste management and sustainable environment. However, the exact meaning of "waste minimisation", "waste prevention", "volume reduction" and distinctions among them are neither clearly defined nor understood. I will define "waste minimisation" as a broad concept to minimize the amount of waste that has to be discarded. The narrower definition of minimisation of waste generation at the source, will be termed "waste prevention". In the broad sense of reducing the generation of waste from domestic sources, usage of used materials at home, including household composting, is included within the domain of "waste prevention". From the viewpoint of waste managers, the reduction of the amount of waste that goes into final disposal is also important. Therefore, three policy options (Waste Prevention, Recovery of Materials & Volume reduction) may be discussed for waste minimisation. Furthermore, the extent of the discussions will be limited to municipal solid waste which comes under the responsibility of local governments.

Waste minimisation can be achieved at many stages during a life cycle of a product from production to final disposal. Different options of waste minimisation at each stage are currently in place or under consideration in many countries. Some of them, such as those for the first two stages, production and distribution stages, must be done by producers, namely manufacturers and distributors, and some require a change in consumer behavior, and all require some form of government intervention, directly or indirectly in the form of encouragement and promotion. Depending on the stage of life cycle, the target of government policies is: a) producers, b) distributors, c) consumers (both public and businesses), or d) central and local governments. All such policies must be considered, and evaluated because effectiveness of government policy is not uniform.

So let's examine legislative measures against the waste problem in Japan. The earliest actions related to waste disposal were public hygiene measures. A shift was subsequently made to environment preservation measures from public hygiene measures, to maintain urban functions and preserve a healthy living environment. Today, moreover, waste disposal has become significant for the purpose of global environment preservation. In 1992, the "Earth Summit" was held in Rio de Janeiro, Brazil. Agenda 21, the action plan for sustainable development was accepted. We have a national environmental basic plan which sets the goals to achieve. The goal is "Recycle Oriented Society"to conserve natural resources and minimize environmental damage. Along these same lines, the Package Waste Recycling Law was put into force in April 1997 and Home Electric Appliance Recycling Law will be put into force in April 2001.

Municipal authorities collect domestic waste, as well as bulky refuse also discharged from households. In addition, some small-scale business waste (such as restaurants' leftover food and gardeners'organic refuse) is brought directly to facilities run by the municipal authorities. Fifty million tons of municipal solid waste is discharged every year. Seventy-six per cent of this is incinerated. The rest of the waste is separated into non-combustibles which is simply disposed of at the landill in small sized municipalities. To prolong the service lives of landfill sites, many municipalities incinerate the entire quantity of combustible waste. Volume is reduced to 27 per cent of discharged waste.

Organic household waste is a major source of garbage; accordingly, home composting plays an important part in waste reduction. In most communities, voluntary citizen groups collect newspapers and magazines for recycling. Municipalities collect glass, metal and plastic bottles as recyclable items. Part of such waste is further screeened and recycled at the appropriate recycling facilities, while bulky waste (large-size items such as home electric appliances or furniture) containing plastics, glass and metal is crushed, after which different substances of value are sorted out and recycled.

Japan's present-day economy is supported largely by industrial activities in the automobile, electronic and other industries. Because of Japan's relative lack of natural resources, the greater part of the raw materials and energy resources necessary to these industries, such as petroleum, iron ore and other mineral resources, have to be imported from abroad. In 1992, Japan's dependence on imported energy was about 80 per cent. Such resources are not infinite. Petroleum deposits, for example, may only last for 46 years and natural gas for 65 years as calculated by dividing the confirmed quantity of deposits by the amount extracted annually. It is readily apparent, therefore, that the recycling of materials and resources is crucial to the 21st century for everyone on this planet. Effective control of natural-resource consumption calls for a shift to production methods that restrict waste generation and include recycling in the product cycle.

Recyclable waste is retrieved through both public and private routes in Japan. Municipal collection of waste (sorted at source) is the main form of public retrieval. Kitchen waste is turned into compost in a few municipalities and, metal and glass portions are recovered from the recyclable waste at sorting facilities in many municipalities. The amount of waste recycled in these ways by municipalities was up to 2.8 self-governing organisms in a local community, like a parent-teacher association of a school urges members of the community, to cooperate in its resource retrieval program. Participants bring recyclable waste to a certain place for pick-up by a retrieval agent.

About 2.4 million tons were collected for recycling by citizens'group. Thus voluntary private-sector activities make up a significant contribution to resource recovery in Japan. To encourage such voluntary recycling activities, some municipalities grant subsidies based on the collected quantity, lend or furnish equipments necessary for the resource recovery, provide information for collection agents, and make public-service announcements directed at community residents regarding recycling activities. The amount of waste recycled by municipalities was 2.8 million and this amount recycled by private routes is 2.4 million ton. Altogether 5.2 million is retrieved through both public and private routes. 5.2 million is about 10 per cent of waste discharged. In addition, a deposit system has been established for empty beer and rice wine bottles returned to liquor stores.

The recycling rates of these items have been rising since the enactment of the Law for Promotion of Use of Recyclable Waste (Recycling Law) in 1991. In 1996, the recycling rate is 53 per cent for old paper, 65 per cent for glass bottles, 70 per cent for aluminum cans and 77 per cent of steel cans.

Now the changes in the conditions surrounding waste disposal can be foreseen in the coming 21st century. Firstly, the necessity of recycling will be all the more acute for the predicted depletion of natural resources in the 21st century. More categories for separate collection will be demanded. Incentives must be found to motivate individuals and organisations to take on the increased responsibility of additional recycling categories. Close cooperation between citizens and administrative authorities will also be essential to ensure proper waste disposal. Secondly, various new recycling techniques will be developed. Among those new developments are a transportation vehicle designed to accommodate recyclables separated according to category, and another vehicle which sorts and presses collected empty cans while in transit. Many other new innovative recycling technologies will be developed. Lastly, much attention will be directed to the global environmental challenges. Widespread collection of separated recyclables and the public's keen awareness of threats to the global environment will cause the people to demand a waste disposal system that can reduce natural resource consumption and environmental damage. It is up to each

of us to successfully tackle these challenges, and waste minimisation and recycling may be one of the best places to start with.

At the OECD, a new public policy called “Extended Producer Responsibility”(EPR), is being studied now as a major means for constructing a successful world-wide waste management system. In the past, the major responsibilities for manufacturers and distributors were the worker’s safety at the production and distribution stages; prevention and management of pollution emission from the manufacturing process; and industrial waste management. Recently, however, Product Liability (the legal responsibility of a manufacturer for a product that is dangerous to the customer), has also become an important responsibility. EPR entails still wider responsibility or reassignment of responsibility to include management of a product after consumption. EPR is based on a new strategy for promoting the internalisation of all environmental and other “external”costs related to the entire life cycle of a product. So they tend to design for environment. Many of OECD member countries have introduced some form of EPR policy. Some cases show the success in terms of waste minimisation, avoidance of landfill disposal, and eco-design of products and changing of life style of consumers. Here we have experts in waste management, in economics and other fields. We are here to tackle the environment problem, especially the waste management problem, one of the most serious problems we may face in the coming twenty-first century. Using your knowledge and experience, we will find the solution or direction from the output of this joint workshop of EPR and waste minimisation. I look forward to a very fruitful workshop.

PRESENTATION [Masaru Tanaka]

OECD Joint Workshop on EPR and Waste Minimisation
May 4-7, 1999

Waste Minimisation, Recycling and Waste Management in the 21st Century

Masaru Tanaka

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National Institute of Public Health, Ministry of Health and Welfare
Japanese Government

Objectives of the workshop

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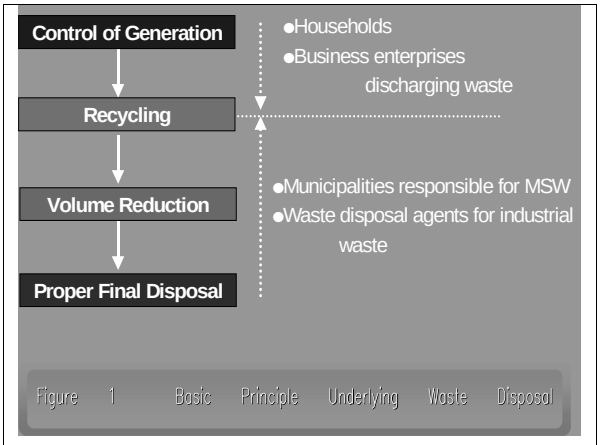

Figure 1 Basic Principle Underlying Waste Disposal

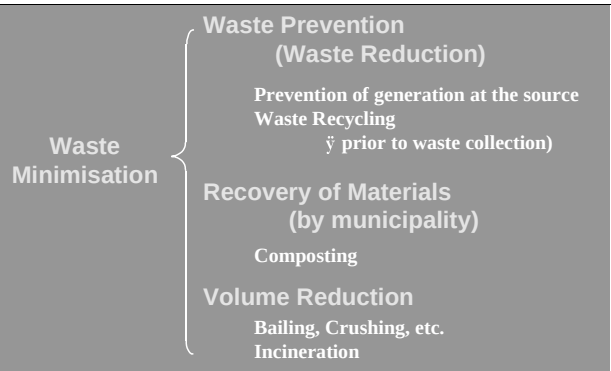

Figure 2 Different Policy Options for Waste Minimisation

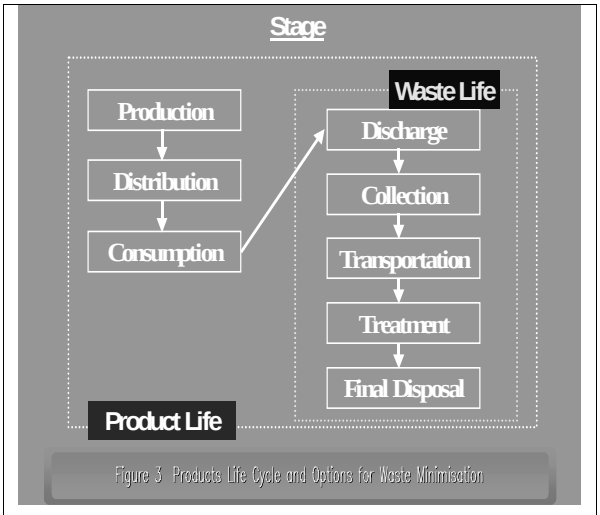

Figure 3 Products Life Cycle and Options for Waste Minimisation

Table 1 History of waste-related legislation

Year	Purpose	Law
1900	Public hygiene measure	ÑDirt Removal Law
1954	Living environment preservation	ÑPublic Cleansing Law
1970	Domestic environment preservation	ÑWaste Disposal and Public Cleansing Law
1991	Global environment preservation	ÑAmendment of Waste Disposal and Public Cleansing Law ÑLaw for Promotion of Resource Recycling and Reuse
1995	Extended Producer Responsibility	ÑLaw for Promotion of Separate Collection and Recycling of Packaging Waste (Package Waste Recycling Law)
1997	Proper disposal of industrial waste	ÑAmendment of Waste Disposal and Public Cleansing Law
1998	Extended Producer Responsibility	ÑLaw for Recycling Specific Home Equipment Into New Products (Home Electric Appliance Recycling Law)

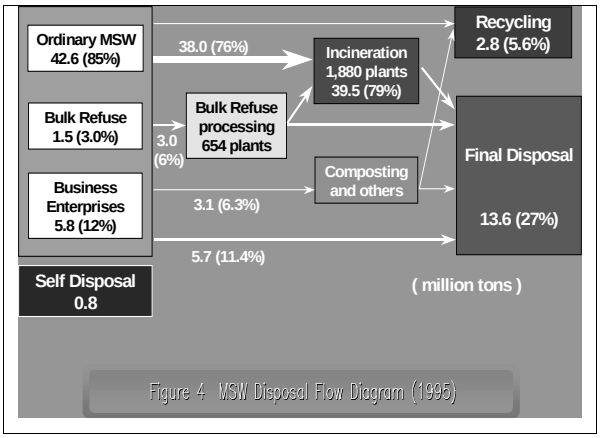

Figure 4 MSW Disposal Flow Diagram (1995)

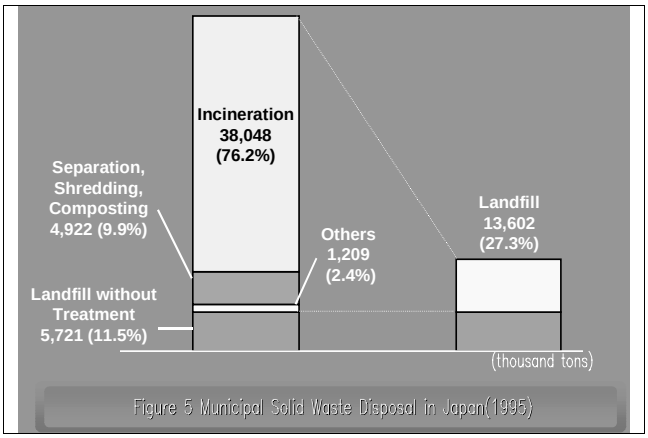

Figure 5 Municipal Solid Waste Disposal in Japan(1995)

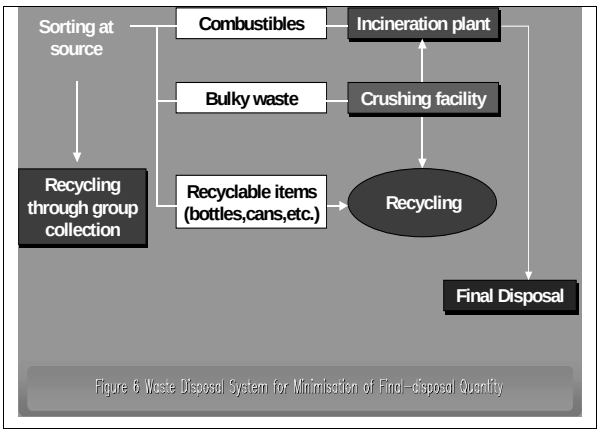

Figure 6 Waste Disposal System for Minimisation of Final-disposal Quantity

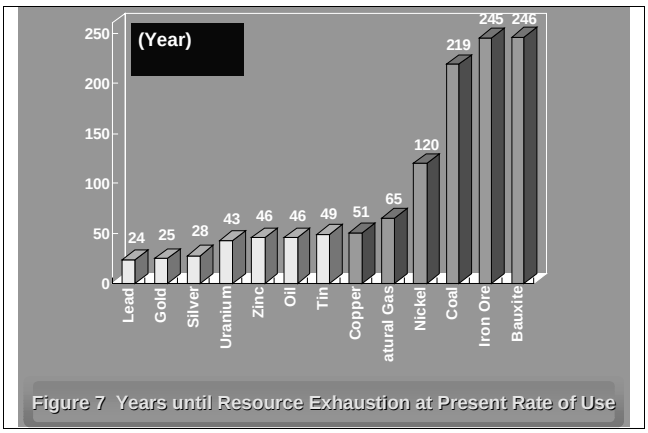

Figure 7 Years until Resource Exhaustion at Present Rate of Use

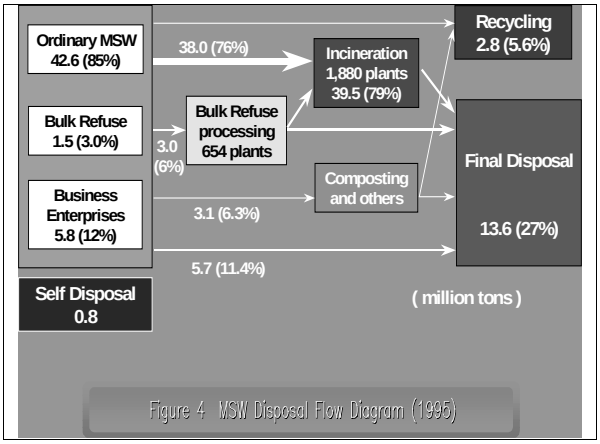

Figure 4 MSW Disposal Flow Diagram (1995)

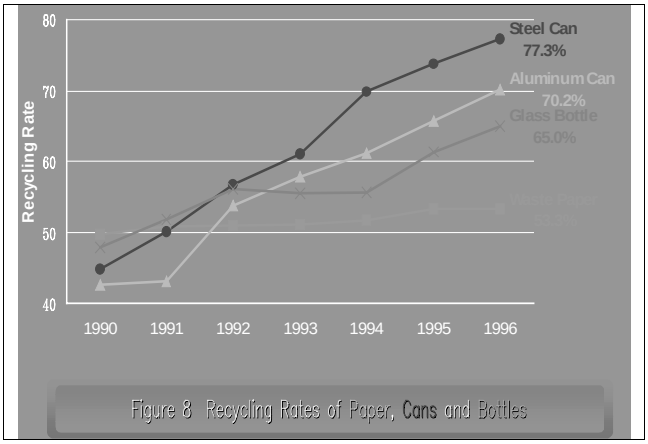

Figure 8 Recycling Rates of Paper, Cans and Bottles

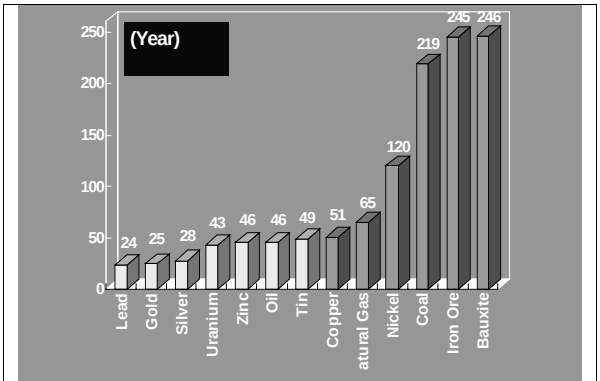

Figure 7 Years until Resource Exhaustion at Present Rate of Use

Table 2 Range of EPR

Production/ distribution stage	Consumption stage	Waste disposal stage
• Safety of workers • Prevention of the emission of a pollutant from a production process to the environment and general management • Financial and legal responsibility for full industrial waste control	Civil-law responsibility associated with a dangerous product	Financial and physical responsibility for post-consumption product management
← Scope of manufacturers' and distributors' responsibility in the past →		← Scope of the administrative authorities' responsibility in the past →
← Scope of EPR →		

Objectives of the workshop

- to provide input to the Guidance Manual being developed for OECD Member governments on implementing extended producer responsibility (EPR) programmes;
- to provide information for an OECD waste minimisation (WM) policy options framework, with strong emphasis on waste prevention;
- to indicate future directions and the role of EPR/WM policies in the context of OECD work on resource efficiency.

OPENING ADDRESS

EPR AND WASTE MINIMIZATION POLICY - JAPAN'S PERSPECTIVE

by Yukio SHIOTA, Director
Planning Division,
Water Supply and Environmental Sanitation Department, Ministry of Health and Welfare,
Japan

Ladies and gentlemen, I am Yukio Shiota, Director of the Planning Division, Environmental Sanitation Department, Ministry of Health and Welfare, Government of Japan.

It is a real pleasure and privilege for me to participate in this important workshop and to have the opportunity of giving a key note speech.

I would like to express my deep respects to Dr. Tanaka, chairman of the EPR session and Dr. Shantora, chairman of the Waste Minimisation session.

Today , I would like to talk to you about some basic ideas relating to the topics of this workshop including the waste management policy of Japan.

1. Introduction

The 20th century was the century of industrialization. Particularly in the member countries of OECD, never-ending technological innovations and the expansion of production and economic activities combined to push up the peoples' standard of living to a remarkably high level. The environmental pollution which posed a social problem in the 1960's, however, induced the realization that economic activities should not be left uncontrolled and unregulated. It has brought about waste management and other problems, and harmony with the environment is now a major common objective of industrial and economic policies in various countries.

In the 21st century, which is only about one year ahead, measures taken by individual governments will no longer be effective against environmental problems. The problems will demand global-scale solutions. The waste management problem, among others, urgently calls for action. International cooperation will be needed to improve existing policies and develop effective and efficient new policies. It is hoped that OECD's studies of extended producer responsibility and waste minimization will result in valuable guidelines for the construction of a socio-economic system with a sound material cycle.

1.2 Significance of "Environmental Conservation" in Socio-economic System

At present, "environmental conservation" is a factor affecting every area of economic activity. In the past, it was a common perspective that the expansion of production and consumption was the force promoting economic growth, creating new employment opportunities and raising the standard of living. This perspective has not been changed completely yet,.

The significance of "environmental conservation" in this socio-economic system is not obvious. "Environmental conservation" is not an absolutely essential factor in product manufacturing cost. It is sometimes regarded even as an undesirable factor restricting free economic and consumption activities. Both manufacturers and consumers would be reluctant to have the "environmental conservation" cost added to the product price. They would be even more reluctant to pay an explicit "environmental conservation" cost apart from the product price.

Our socio-economic system is basically oriented toward the pursuit of benefits for individuals and business enterprises. Manufacturers were interested in cost reduction in their manufacturing processes and profit earning while consumers always sought useful low-priced products. As a consequence, a social structure characterized by mass production, mass consumption and mass waste discharge was formed through operations on the principle of free economic activities. We are still restrained by this system even now.

OECD proposed the Polluter Pays Principle (PPP) as a solution to the "pollution problem" presented by unregulated production activities and by their adverse effects on the living environment and human health. PPP penetrated OECD countries, contributing to the establishment of legal systems and the progress of self-regulating efforts in business enterprises in those countries. However, it only serves to prevent the adverse effects on the environment by manufacturing processes. The concept of "producer responsibility", though widely accepted in various countries, provides only the guarantee of the proper functions inherent in a product.

"Environmental conservation" should be supported by all members of the society. Each member is required to behave with due consideration given to the entire sequence from manufacture to waste discharge. The "environmental conservation" scene, characterized by an acute shortage of final disposal sites, the generation of dioxins from the incineration process and so on, is currently harder than ever. Prompt and effective measures should be taken to reduce and properly dispose of waste.

In OECD countries, therefore, all society members from producer to consumer should humbly comprehend the significance of "environmental conservation" in the society and economy and cooperate in drastically renovating the present socio-economic system and constructing a socio-economic system with a sound material cycle. Even if there happen to be some restraints and disadvantages in building a new system, they should be borne by all members of the society.

2. Extended Producer Responsibility

2.1 Significance of the Study of Extended Producer Responsibility

Extended Producer Responsibility is the concept that producers assume certain responsibilities in connection with the disposal of their products discarded by customers. Measures against the waste management problem should not be targeted at the disposal stage alone but should cover all aspects of the stream of material from production to discharge. The downstream action at the waste disposal stage should be properly reflected in the manufacturing stage (upstream). Manufacturers have the right to decide on certain product specifications and structure, and to select a particular material. They should be engaged in

the disposal of discharged waste products to alleviate the difficulty in waste disposal and shift to the manufacture of products with less adverse effect on the environment.

How the concept of extended producer responsibility is to be reflected in an environmental policy and how it is to be materialized into a system are still under discussion in most countries. Trial- and- error efforts are being made currently. Even though waste reduction and recycling can be promoted in a short period by introducing a new system, the long-range effect is still not in prospect. There is no better solution based on common recognition in all OECD countries with respect to settlement of the conflict of interests related to a newly introduced system and the proper assignment of roles.

OECD's study of extended producer responsibility will involve a discussion of the scope of producer responsibility and the roles of the members of the society (in particular, the relationship between producers and municipalities) in the path toward a socio-economic system with a sound material cycle and will provide guidelines for the government's smooth and proper introduction of the new system.

Of course, the imposing of responsibility on manufacturers is not sufficient for the construction of such a socio-economic system. Cooperation and the performing of assigned roles by all members of the society are indispensable. It must be remembered that certain responsibilities should be assumed by all those concerned, including consumers.

2.2 Extended Producer Responsibility in Japan

Waste management in Japan involves difficulties attributable to the country's fast economic growth in the past and the growth of waste due to it, its hot and humid climate and the inevitable incineration process due to it, and a limited number of places suitable as new final disposal sites. Establishment at an early date of a drastic policy was demanded. In 1994, OECD was requested to start a study of extended producer responsibility, and the Japanese Health and Welfare Mininistry has made necessary contributions to the project . The success of this study is expected to bring a great benefit for OECD member countries.

To reduce the environmental load throughout the life cycle of a product in a consistent series of steps from manufacturing to the disposal of waste products, it is obviously essential to ask the manufacturers to participate in the disposal of waste products. The reason and the logic of producers' participation, however, are not firmly established and ripened yet. These must be described in detail in the OECD's study of extended producer responsibility.

While the study was being made by OECD, Japan was establishing legal systems for waste reduction and recycling.

The Japanese legal systems prescribe various actions according to the characteristics of products or wastes. The Law for Promotion of Utilization of Recyclable Resources (1993), applicable to almost all industrial products, is intended as a statute for encouraging manufacturers to take action on their own. The Packaging Waste Recycling Law (1995) directs attention to cost internalization and disposal by third-party organizations (Producer Responsibility Organization). The Electrical and Electronics Equipment Recycling Law (1998) focuses attention on externalization of the disposal cost and disposal by individual manufacturers.

(1) Packaging Waste Recycling Law

In 1995, the Packaging Waste Recycling Law was enacted to promote the recycling of household packaging waste which was traditionally collected and disposed of by municipalities. This law prescribes the following functions of those concerned:

- Separate discharge by consumers.
- Separate collection and intermediate processing by municipalities including selection and washing which can convert the waste into a form for easy recycling.
- Take-back of packaging waste from municipalities for recycling by Package manufacturers and package-using enterprises.

Since packages are usually thrown away immediately after purchase and various packages are disposed of at the same time, the disposal cost is to be built into the product price.

As packages are circulated throughout the country and it is usually difficult to collect and recycle only the packages of a particular producer, a third-party organization's role is quite important.

The separate collection of metal cans, glass bottles and PET bottles among all kinds of packaging waste for recycling was started in April, 1997. The number of municipalities separately collecting waste has been steadily increasing, and this means an increase in recycling activities.

The law will come to full enforcement and be applied to all paper containers and packages such as decorative boxes and to all plastic containers and packages including wrappers in April, 2000. Preparations are currently under way.

(2) Specified Household Appliance Recycling Law (Electrical and Electronics Equipment Recycling Law)

The Specified Household Appliance Recycling Law was enacted in 1998 to promote the recycling of waste from household electrical appliances.

This law provides the following items.

- consumers are to discharge waste in a proper manner and put it on the recycling route;
- retailers are obligated to take back waste from consumers and hand it over to manufacturers; and
- manufacturers and importers are obligated to take back waste and recycle it beyond a certain performance level (50 to 60% by weight).

As home electric appliances are durable consumer goods serviceable for about 10 years from purchase to discharge and as this statutory system covers also items sold on the market and used by consumers before the enactment of this law and for other reasons, the retailers, manufacturers, etc. can charge consumers a fee at the time of waste discharge.

End-of-life household electrical appliances have been collected by municipalities as bulk waste, and a disposal fee and door-to-door collection have been adopted by about 30% of all municipalities. The

practice of take-back of end of life electrical appliances by retailers in exchange for a new purchase has been also extensively adopted.

Since end-of-life electrical appliances are basically discharged from individual households and the manufacturer of a particular product can be identified, the manufacturer is obligated to recycle that product in principle. A third-party organization acts only in case of bankruptcy of the manufacturer or on commission from a small or medium business enterprise.

This law will be put into force in April, 2001. The expected recycling rate in the initial years is 60% for air conditioners, 55% for TV sets and 50% for refrigerators and washing machines. Although the law prescribes a certain heat recovery process, the recycling rates don't currently include the use as a heat source.

2.3 How To Fulfill Producer Responsibility

The concept of extended producer responsibility, centered around the engagement of the producer in disposal of their products discarded as waste, presupposes the internalization of the necessary disposal cost in the product price. As for an economic incentive for environment-friendly manufacturing with a due allowance for the necessary handling of discharged waste goods, it is not deniable that the internalization of the disposal cost, i.e., the manufacturer's disbursement of the cost, is most effective. However, is the internalization of the cost, that is, the manufacturer's fulfillment of an obligation to take financial responsibility, sufficient to solve the whole problem?

In Japan, the manufacture and sale of small-capacity P.E.T. bottles (500 ml?) and less), which could have increased the amount of P.E.T waste because of the convenience, were controlled by manufacturers on their own initiative. However, the output and sales of such bottles have been increasing since the establishment of the statutory packaging waste recycling system. The bottles for imported beverages, especially those for wine, are hard to recycle in Japan, but their imports have been remarkably increasing. The manufacturers and importers fulfill their obligation by bearing the disposal cost incurred and internalizing it in the product prices. How should this be evaluated?

It is essential to impose a procedural burden in some form on manufacturers to have extended producer responsibility duly fulfilled, as well as the financial burden derived from disposal cost. Hence the function and role of the third-party organization (PRO: Producer Responsibility Release Organization), which has been discussed regarding extended producer responsibility (EPR), should be so designed as to actually compel manufacturers to modify the manufacturing process and the product.

Of course, self-regulation with an adequate allowance for environmental conservation is demanded for manufacturers. Consumers should change their style of consumption. However, the waste management problem demands prompt action. Consideration should be given to the interrelations with the assurance of free economic activities. In some cases, it may be necessary to introduce a mechanism directly affecting the manufacturing stage. Also national governments will have to introduce policies for the promotion of environment-friendly trade activities, e.g., a policy for promoting wine exportation for bottling in the importing countries.

3. Waste Minimization

Because extended producer responsibility is associated with the construction of a socio-economic system with certain defined responsibilities and roles of those concerned down the series of steps from manufacturing to discarding of waste, waste minimization involves an evaluation of waste handling

procedures to find an optimum disposal method or an optimum combination of methods for waste minimization.

3.1 Waste Minimization Efforts in Japan

In Japan, the Basic Environment Law was enacted in 1993, and the Basic Environment Plan was formulated the next year to comprehensively and systematically promote environment conservation based on the law. The following order of waste disposal priorities was established:

- Reduction of the generation of waste.
- Re-use of used products.
- Recycling into raw material.
- Promotion of environment-friendly use of heat recovered from incineration where the technological level makes such recycling difficult or not economically feasible.
- Proper disposal of generated waste.

Waste minimization can be accomplished in three different ways:

- Discharge stage: Control of the volume of waste at the generation stage by choosing long serviceable products, using products for a long period, etc.
- Intermediate treatment: Reduction of the waste to be disposed of, by raising the recycling rate.
- Final disposal: Reduction of the final-disposal volume by properly treating the waste to be disposed of.

Prior to any discussion of waste minimization, it is necessary to identify the stage on which attention is focused. With regard to the third stage, final disposal, the role of "incineration" as a disposal method is an important topic of discussion.

3.2 Significance of Incineration and Its Relation With Various Disposal Methods

The climate of Japan is hot and humid on the whole in comparison with those of other OECD members. In Japan, it was an important task to dispose of waste in a hygienic way so as to prevent the possibility of infection or the generation of bad odors. Accordingly, a waste disposal system traditionally built around incineration was established.

Nearly 90% of the total land space of Japan is mountains, and the population density is markedly higher in Japan than in other OECD members. Places suitable for landfill sites are extremely limited. The remaining capacity of the existing final disposal sites is only for several years. It is therefore absolutely essential to reduce the volume of waste bound for a landfill site.

There is a limit to waste reduction (control of waste discharge) and promotion of recycling. It is difficult to avoid landfill disposal for every kind of waste. Those wastes which absolutely demand landfill disposal

require "volume reduction" prior to landfill disposal. Incineration is most effective as a method of reducing the volume of combustible waste. Incineration is not necessarily undesirable provided proper measures for the conservation of the living environment, including effective countermeasures against exhaust gases are taken.

It is imperative to find an appropriate combination of waste disposal measures (including recycling) according to the situation in the particular country for the purpose of waste minimization. A similar principle should be followed when an evaluation is conducted. When studying the waste minimization measures and proposing an order of priority, OECD should attach primary importance to proposing desirable alternatives with the foregoing matters taken into consideration.

3.3 Present Discussion in Japan

In Japan, all aspects of waste disposal are being discussed at present in connection with the proper organization for waste disposal and the assignment of responsibilities. In some instances, those kinds of industrial waste committed to the private sector for disposal in the past have been found difficult to handle by business enterprises in actuality. The possibility of public intervention in this field is also discussed. To propose figures indicating the extent of waste discharge control and the extent of volume reduction and recycling of generated waste, efforts are currently being made to formulate a national-level waste reduction plan.

4. Conclusion

The main points discussed in connection with a study of extended producer responsibility are;

- the way the manufacturer bears the cost of disposal of waste products discharged and
- which is more appropriate - a compulsory method or a voluntary method , when the concept of extended producer responsibility is incorporated into a policy.

At present, waste is of diverse kinds, and products are distributed and used in various ways. One method or one concept is not sufficient to overcome a particular problem. A national government formulating and introducing a policy should find the best combination of alternatives to harmonize "environmental conservation" with the socio-economic system in a form suited to the actual conditions in the country, such an optimal combination of policies is important for waste minimization purposes also. Thus it is necessary to study the best combination of disposal methods including control of waste discharge and incineration in order to reduce the final-disposal volume.

It is hoped that OECD will provide policy alternatives to the member countries through its studies on extended producer responsibility and waste minimization in order to cast light on the problems and key issues involved in the individual policy methods. These will contribute toward the governments' effective policy formulation and smooth introduction of a new system.

Ladies and gentlemen, before closing my speech, I would like to express my hope that participants will have active discussions during this workshop and bring about useful results. Thank you very much for your kind attention.

ANNEX 1

AGENDA

Day 1

Tuesday, 4 May, 1999	**Plenary**
Session 1 15:00-16:00	***Opening*** • Mr. Masaru Tanaka, Director, Department of Waste Management Engineering, National Institute of Public Health, Japan • Ms. Joke Waller-Hunter, Director, Environment Directorate, OECD
Session 2 16:15-18:00	***Policy Context*** • Mr. Alain Strebelle, Deputy Director of Products and Waste, Ministry of Environment, France • Mr. Yukio Shiota, Director General, Environmental Sanitation Department, Ministry of Health and Welfare, Japan • Mr. Ludwig Kraemer, Head, Waste Policy Unit, Environment Directorate, European Commission • Mr. Fritz Balkau, UNEP, Office of Industry and Environment
18:30	***Reception Hosted by the Japanese Ministry of Health and Welfare***

Day 2

Wednesday, 5 May, 1999	**Extended Producer Responsibility**
Session 3 9:30-13:00	***Analytical Framework and Policy Options for EPR*** **Objective** To examine the realm of policy options for EPR and how these options, and other criterion, can be incorporated into an analytical framework. **Speakers** **Kees Clement**, Ministry of Environment, The Netherlands, *EPR Policy Options: The Dutch Perspective* **Henrik Troberg**, Electrolux, Sweden, *View of Extended Producer Responsibility for the Appliance Industry* **Bette Fishbein**, Inform, USA, *Policy Options for EPR Take-Back Programmes* **Michael Bennett**, Australia, *An Application Matrix for EPR Programmes* **Discussion Points** • What are the different policy options for EPR policy? • Is there a more preferred policy option for one product group or waste stream over another? If so, why? • What are the specific attributes that set different products apart? • Is there a hierarchy/matrix of different options for different products/wastes streams? • How can the different options be applied?
Session 4 14:30-18:30	***Monitoring and Reporting on EPR Achievements*** **Objective** To indicate what monitoring and reporting information is necessary to reveal progress and achievements of an EPR programme. **Speakers** **Victor Bell**, Environmental Packaging, USA, *Can International Compliance Reporting be Harmonized?* **Akira Ueno**, Japan Container and Package Recycling Association, *A Report on an Exercise of EPR in Japan* **Ron Driedger**, British Columbia Ministry of Environmental Lands and Parks, Canada, *The British Columbia Experience in Monitoring and Reporting on EPR Programmes* **Erja Heino**, Finnish Association for Nature, *The Targets of EPR and Related Waste Prevention Policies* **Discussion Points** • What type of data and indicators are needed to monitor progress of an EPR programme? • How could this information be used to monitor environmental progress (e.g., reduced use of materials and hazardous substances, etc.)? • Is there a common set of reporting elements for EPR programmes?

Day 3

Thursday, 6 May, 1999	**Extended Producer Responsibility**
Session 5 9:30-12:30	***Evaluation of EPR Programme Performance*** **Objective** To identify criteria and possible methods for evaluating EPR programme performance as well as for dissemination of these results to a wide audience. **Speakers** **Sergio Galeano**, Georgia Pacific, USA, *Evaluation of Policy Options: A Requirement in National Waste Minimization Improvements* **Jacques Fonteyne**, ERRA, Belgium, *Extended Producer Responsibility Monitoring Performance* **Bernard Herodin**, Eco-Emballages, France, *Eco-Emballages: The French Solution* **Gary Davis**, University of Tennessee, USA, *The Principle of EPR* **Discussion Points** • How can an EPR programme be evaluated e.g., methods and criteria? • How can the results of the EPR programme be communicated to the public? • Can EPR programme evaluation be linked to waste minimisation, eco-efficiency, and resource-efficiency?
Session 6 14:30-18:00	***Summary of Discussions*** **Objective** To discuss a draft summary outline of the preceding sessions. **Discussion Points** • Review and comment on draft outcomes of EPR sessions 3, 4 and 5. • Identify main themes of workshop. • Prepare for joint plenary (e.g., Identify how EPR can compliment waste minimisation programmes, etc.)

Day 4

Friday, 7 May, 1999	**Extended Producer Responsibility**
Session 7 9:30-11:00	***Joint WM and EPR Summary*** **Objective** To summarise WM/EPR sessions and identify links between the two areas. **Discussion Points** • WM/EPR links with respect to target setting, performance evaluation, and performance improvement • Possible tools for linking EPR and WM policies (e.g., facility permits, EMS, other)?
Session 8 11:30-13:00	***Future Directions and National/International Challenges*** **Objective** To explore and examine prospective directions and priorities for WM/EPR on national and international levels. **Speakers** Masaru Tanaka, National Institute of Public Health, Japan Vic Shantora, Environment Canada. Canada Reid Lifset, Yale University, United States **Discussants** Peter Hermens, Ministry of Environment, The Netherlands Gary Davis, University of Tennessee, United States **Discussion Points** • How to design policy to enhance the complementary role of EPR and WM? • How to use of WM/EPR to advance government efforts that promotes resource efficiency and sustainable development? • Key national and international priorities over the next 5-10 years? • Future Role of OECD in these areas?
Session 9 13:00-13:20	***Closing***

OECD INTERNATIONAL WORKSHOP
Extended Producer Responsibility and Waste Minimisation Policy in Support of Environmental Sustainability

4-7 May 1999

OECD Headquarters
Paris, France

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