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Waste Diversion Developments in Western Europe 1994 to 1997

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I. INTRODUCTION

Waste management (WM) planning and policy decisions in Europe are generally done at the level of national ministries. Most European national environmental ministries, even those of countries who are not members of the European Union (EU), are planning and implementing policies in response to current or anticipated EU directives on waste management.¹

Western European governments are generally design their WM systems around a WM hierarchy, with waste prevention being given the highest priority, followed by reuse, recycling, materials recovery, energy recovery, and disposal as the last resort. There is some variation in this approach, even within the EU. Most Northern European nations, for example, give materials recovery a higher priority than energy recovery, France does not distinguish between the two, and assigns them equal weight in keeping materials out of landfills. In Denmark, priority has been given to incineration with energy recovery.²

Within the EU, it is possible to identify a progressive waste elite -- four or five Northern European nations whose solid waste and recycling practices give a high priority to waste reduction and whose policies and programs are generally on the cutting edge of solid waste developments. These progressives include Denmark, Germany, and the Netherlands, who are sometimes joined by Sweden or Switzerland, depending on the issue.³

In these progressive countries and many other EU nations, materials recovery and recycling have been accepted as an essential aspect of government-sponsored integrated solid WM systems. This is reflected in official policy documents at both the national and EU levels, and is widely evident in practice. Nevertheless, there are considerable variations in European practices in source reduction, materials recovery, and recycling. These variations occur in substantive approach, methodology, degree of political and fiscal commitment, and the markets that are available.

II. THE DEVELOPMENT OF A EUROPEAN UNION WASTE STRATEGY

1. Introduction

The general principles of European Community environment policy were incorporated into the EU Treaty as legally binding commitments. The environmental activity of the Union is to be directed towards preventing environmental pollution (prevention principle), rectifying it at source whenever possible, making those who cause it liable to bear the cost (polluter pays principle), and treating environmental protection as an integral part of the other Community policies.⁴ In 1995 waste generation in the EU was estimated at between 1.6 and 2 billion metric tons per annum.⁵ Only about 2% of this total was recycled.

The current EU Waste Strategy was formulated in 1989 and endorsed through a Council Resolution of 7 May 1990. It is focused on prevention/reuse, the promotion of recovery, the minimization of final disposal, the regulation of transport and remedial action. A number of developments have affected the implementation of the waste strategy, including experience with the approaches adopted between 1990 and 1995, important judgments by the European Court of Justice involving trade issues, and developments at the international level, particularly the adoption of the *Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal*.⁶

Pursuant to the EU Waste Strategy, the European Commission (EC) issues "proposals" that are then developed into Directives and decisions through an interactive process. Directives give national governments general mandates, numerical performance targets, and a certification or documentation procedure. However, Directives also allow a degree of flexibility in compliance by member states. Member states may enact national laws and/or formulate voluntary agreements with industry to fulfil Directive requirements.

2. EU Community Policy on Waste Management

Directive 75/442/EEC constitutes the legal framework for Community policy on WM. It entered into force in 1977 and was amended in 1991 (91/156/EEC) to incorporate the hierarchy set out in the Community Strategy for WM in 1989, namely, prevention, reutilization, and ultimate disposal. The Directive contains the main points on which Community WM policy is based, in particular:

- * a definition of waste;
- * a common terminology for the operations of reuse and ultimate disposal;
- * a hierarchy of priorities to be applied by any WM policy, beginning with prevention and followed by the promotion of reuse and finally hazard-free disposal;

- * the application of the principles of proximity and self-sufficiency to the final disposal of waste and the establishment of integrated networks of disposal facilities;
- * the obligation on the part of the member states to establish WM plans;
- * the establishment of an obligatory licensing procedure for any company engaging in disposal or reuse operations plus a system of oversight and periodic reporting on these operations.⁷

A 1996 European Commission report noted that considerable progress has been made in completing the Community legislative framework for WM policy, but pointed out a number of problems. Among other things, a substantial part of the legislation recently adopted at the member state level will not take effect before 1997. Consequently, the targets for the year 2000 may not be fulfilled.

3. The European Waste Catalogue

In order to facilitate the implementation of waste legislation, and to monitor national initiatives, Council Decision 94/904 established a list of hazardous waste, and Commission Decision 94/3 EC (pursuant to Council Directive 75/442/EEC), established the European Waste Catalogue (EWC). This is to be a comprehensive listing of waste definitions and calls for the compilation of waste statistics. It is to address the need for a state-of-the-art inventory comprising EU data on the production, collection, and disposal of wastes. Differences in definitions, classification systems, scope, and methodologies for data collection among member states had made the development of such an inventory difficult.⁸

4. EU Waste Movement Regulations

The harmonization of waste classification systems is crucial for developing comparable waste control systems across European countries. The OECD has developed an International Waste Identification Code in an attempt to harmonize definitions and establish an international waste classification system. The OECD countries have also adopted a classification system for waste destined for recovery operations. This distinguishes wastes in terms of the 'green', 'amber', and 'red' lists, depending on the level of hazard, and corresponding level of control which applies for their transfrontier movement. These lists have been introduced into EC Council Regulation 93/259/EEC, on the supervision and control of shipments of waste within, into and out of the EU, which entered into force in May 1994.⁹

This regulation transposes into EU law relevant international agreements such as the Lome IV Convention, the Basel Convention, as well as the OECD Decision on the Control of Transfrontier Movements of Waste Destined for Recovery Operations. The regulation

takes into account the objective of minimizing waste movements destined for final disposal on the basis of the principles of self-sufficiency and proximity. It also regulates shipments of waste destined for recovery operations. Recovery is promoted, along with the prevention of shipments of waste to recovery installations which are environmentally unacceptable.¹⁰

The target of not exporting waste destined for final disposal outside the EU by the year 2000 has been implemented. Exports are only permitted to EFTA countries (European Free Trade Association) which are also parties to the Basel Convention, such as Norway and Switzerland.¹¹ Discussions have been held to ensure a total ban of exports of hazardous waste to non-OECD countries for final disposal, and to achieve a general ban of hazardous waste exports for recovery to non-OECD countries as of 1 January 1998.¹²

Exports of non-hazardous waste for recovery to non-OECD countries are in principle not subject to any control procedures under Regulation 259/93. However, after consultation with these countries, control procedures will be introduced unless the Commission receives an indication to the contrary from the importing country.¹³

5. The EU Priority Waste Streams Programme

A Priority Waste Streams Programme (PWS) was initiated by the EC in 1991 to establish action plans for particular types of waste. The aim was the development of new instruments for implementing the WM policy, both different from and complementary to the regulatory approach. Projects on used tires and end-of-life-vehicles concluded in 1995. A project on health care waste was concluded in 1996. Project work has been progressing on construction and demolition waste, and waste electrical and electronic equipment.¹⁴

6. The Proposed EU Landfill Directive

Landfilling is an unavoidable component of all European waste systems. In certain northern European countries, less than half of the waste may be landfilled. In southern countries like Greece and Spain, or Eastern European countries such as Hungary and Poland, virtually all waste finds its way to land burial.¹⁵ In 1995 more than 60% of municipal waste generated in Western Europe was disposed of into or onto land¹⁶. A 1997 EU Draft Landfill Directive identifies three kinds of landfills: hazardous waste; municipal waste; and inert materials. Monofills - landfills for one particular material - are also recognized in the directive.

A Council Directive on the landfill of waste, COM (97) 105 final, was finalized in March of 1997. The original draft had been rejected by the European Parliament. The Directive was motivated in part by requests for an EU-wide landfill policy that emerged during the discussion for a new EU Waste Strategy in 1995 and 1996. The new Proposal on landfill raises standards and takes into account national legislation adopted since the

discussion of the original Draft Directive. It is more stringent and will likely be more costly to comply with.

The main objective of the Proposal is to ensure high standards for the disposal of waste in the EU and to stimulate waste prevention through recycling and recovery. The proposal also seeks to create a level playing field within Europe for waste disposal costs, and thereby reduce the unnecessary transport of waste.

It is felt that without Community provisions for landfills, there is a risk that shipments of waste for landfilling will increase as, in the absence of appropriate environmental standards, landfilling is considerably less expensive than incineration. Such shipments would also go against the objective of Regulation 259/93 that seeks to reduce, as far as possible, all waste movements.

The other key elements of the landfill proposal include:

- * provisions to reduce the landfill disposal of biodegradable waste and to ensure that the gases produced in new as well as existing landfills are collected, treated and used. It would also introduce a limit for the disposal of biodegradable waste. Waste with a total organic content of more than 10% would be banned from landfill 5 years after the Directive is adopted. This provision aims to reduce methane emissions from landfills and to encourage separate collection of biodegradable waste;
- * a requirement that waste be treated before it is landfilled in order to reduce its volume or hazardous characteristics. A broad definition of pretreatment is proposed to encourage methods other than incineration;
- * the disposal of used tires (whole and shredded) would be prohibited in order to prevent landfilled tires from making landfill sites unstable, to reduce the risk of fire, and to encourage the recovery of tires;
- * member states would be required to ensure that the price charged for the disposal of waste in landfills covers, at a minimum, all costs involved in the setting up and operation of sites. The price should also include the costs of financial securities as well as the estimated costs of facility closure and aftercare for a period of at least 50 years. This provision aims to restore the balance between the costs of landfill disposal, which at present tend to be low, and the costs of other treatment methods, such as recovery/recycling, for which the costs are relatively high;
- * the joint-disposal of hazardous and non-hazardous waste would be prohibited;
- * the general environmental requirements for all classes of landfills would be improved through the introduction of a minimum distance from landfills to residential areas, emphasizing the surface sealing of the sites, prohibiting the spreading of dirt from

sites onto public roads and the surrounding land, and requiring fencing and control of access to the sites to prevent illegal dumping;

- * upgrading plans would have to be presented for existing landfills within 3 years of the entry into force of the proposal and be implemented within 5 years;

Small islands with only one landfill and isolated settlements may be exempted from some provisions of the proposal.

The proposed directive is expected to generate significant environmental benefits in terms of reduced amounts of waste disposed in of landfill. It is also intended to result in lower methane gas emissions, reduced risk of leachate leakage, and fewer nuisance problems associated with landfills.

7. The Proposed EC Labelling System

In 1996 the Commission formulated proposal COM (96) 603 final, which proposes a new eco-labeling scheme pursuant to Regulation (EEC) No 880/92 of 1992. This is in parallel with similar efforts at the ISO. The new eco-label scheme is intended to promote the design, production, marketing and use of products which have a reduced environmental impact during their entire life cycle, including waste management. The intention is to provide consumers with better information of the environmental impact of products on which to base purchasing decisions.

In 1997 the EC had drafted amendments to the eco-label regulation delegating responsibility to an association of national bodies. A European Eco-label Organization is to be set up to review all eco-label criteria, and to coordinate the work of national bodies. The draft proposes a tiered system of awarding labels similar to a rating system in which products meeting basic criteria would be awarded a single logo designation while those meeting stricter qualifications could be awarded a two- or three-logo label.¹⁷ To date eco-label criteria have been published for 10 product groups and the eco-label has been awarded to 45 products.

8. The New EU Waste Strategy

Increasing waste generation and the evolution of WM policy development with respect to new instruments and approaches lead to pressures for changes to the 1989/90 waste strategy. In July of 1996 the EC issued an amended EU Waste Strategy in the form of a "communication" for comment. It was a compromise document following lobbying from all quarters. The general objective was defined as being "to ensure a high degree of environmental protection without distorting the functioning of the internal market, with a view to promoting sustainable development."

The draft strategy stated that preference among recovery methods should be given to the recovery (recycling) of material over incinerating waste to produce energy. However, it implied that there should be flexibility in choosing recovery methods and that, in some cases, the preferred choice might be energy recovery by incineration. It acknowledged that waste recovery operations are an increasingly important source of energy.

The communication also introduced the concept of producer responsibility, and stated that manufacturers had a predominant role in dealing with their products once they became waste. Other key points in the communication included:

- * the principles of self-sufficiency and proximity apply only to waste for disposal. Wastes shipped for recovery operations must submit to the principles of the internal market. This means that while member states might oppose shipments of waste for recovery, they cannot ban exports of waste for recovery on the grounds that their own recovery installations need security of supply;
- * a desire to create a level playing field for recovery operations based on strict standards;
- * acknowledgment that the EU's definitions of waste and hazardous waste have not solved all the problems of distinguishing between wastes and goods. It accepts a distinction based on economic value, as industry has wanted;
- * no new priority waste stream projects are identified;
- * the promotion of the use of economic measures is highlighted;
- * a desire for jointly set targets for the reduction or recovery of waste is expressed; and
- * there is an acknowledgement of serious problems with the quality of waste statistics.

The communication was criticized for lacking a clear long-term vision of how the EU would reduce its growing waste stream. Industry was wary of the general preference for material recycling and the producer responsibility principle. Environmentalists felt it lacked credibility in the absence of action by the EU on the issue of liability for damage to the environment and because it didn't establish a new WM sub-hierarchy to demote the status of incineration with energy recovery to that of a disposal operation.¹⁸

In response to the communication, the European Parliament urged consideration of:

- * a WM hierarchy comprising, in order of priority, prevention, reuse, recycling, recovery of materials, energy recovery, and final disposal;
- * the reclassification of incineration without sufficient energy recovery as a form of

disposal;

- * a requirement that WM facilities comply with stringent minimum environmental standards;
- * the promotion of markets for recycled materials by imposing a virgin materials tax, a minimum waste levy, and a packaging levy;
- * the enactment of minimum quantitative targets for recycling and waste reduction;
- * legislation on priority waste streams with Directives as soon as possible on those waste streams already examined at the EU level (used tires, end-of-life-vehicles, health care waste, electrical and electronic waste, construction and demolition waste, and small quantities of hazardous waste in the domestic waste stream). These should be based on the principle of producer responsibility; and
- * an EU-wide disposal policy that would outlaw the practice of joint disposal (the disposal of hazardous and non-hazardous wastes in the same landfill).¹⁹

In December 1996 the European Council of Environment Ministers passed a non-binding resolution on the amended Strategy. The Council resolution stressed the principle of shared responsibility but placed limits on producer responsibility requirements, suggesting that the EC may face resistance from some member states to any proposals based on extended producer responsibility, such as its planned Directive on end-of-life vehicles. The Council Resolution also asked for targets for waste reduction and increased recycling and reuse. It called on the EC to promote the development and application of life-cycle assessments to assist in the identification of future WM priorities as well.

In addition, the resolution asked the EC to consider reclassifying incineration with energy recovery from the status of a recovery operation to that of disposal. This would make cross-border shipments of waste destined for incineration more difficult. The Council also urged the EC to intensify efforts to develop agreed-upon waste terminology and definitions to help achieve a greater degree of harmonization in the application of EU legislation. The resolution urged the EC to consider reviewing the European Waste Catalogue with the aim of improving its effectiveness. In particular, it pointed to the need to distinguish more clearly between waste and non-waste goods.

Other issues addressed by the Council resolution included: the need for markets for recycled materials; ensuring enforcement of EU waste legislation; the need for a reliable EU-wide system of data collection for waste; the need to develop follow-up to waste projects completed within the framework of Priority Waste Streams Programme, and to explore how other waste streams should be dealt with at the EU level; and a need for member states to orient their waste policies towards job creation. The resolution concluded by requesting that the EC report on progress made in these areas by the year 2000 at the latest.²⁰

9. Trade Disputes within the EU Arising from Waste Management Initiatives

Trade disputes in Europe are increasing in intensity with respect to the transfrontier movement of wastes and the use of bans, levies, taxes, deposits and refillable quotas aimed at one-way beverage containers. Legal challenges have been mounted by the EU on behalf of certain member states, against regulations adopted by other member states that are seen as trade barriers.

Trade disputes have arisen, for example, with respect to some national reusable packaging schemes which have come under attack from producers and users of one-way packaging who allege that these constitute an unjustified barrier to free trade. Reuse requirements are widely seen in the packaging industry as protecting domestic manufacturers of beverages and other products against international competition, since it makes less economic or environmental sense for foreign producers to transport their packaging back over long distances for washing and refilling.

In 1996 the EC's environment directorate began drafting a paper titled *Communication on Environmental Levies in Member states*, to provide EU member states with guidance on the use of environmental taxes. It pointed out the disruptive influence that taxes, levies, and other economic instruments can have on the internal market. The paper stresses that their use needs to be in line with other relevant EU rules, such as those on state subsidies and antitrust. The paper also underlined the critical role of provisions for monitoring and review in the design of new environmental levies, and the need for careful evaluation of their effects. The paper highlights the continuing struggle within the Commission over how to strike a balance between trade and the environment.²¹

10. Conclusions

A number of key themes have emerged in the development of waste management policy at the European Union level. These include the establishment of requirements for national waste management strategies, with specific goals and targets for diversion. A waste management hierarchy of prevention, reuse, recycling, recovery of materials, energy recovery and final disposal has been adopted.

There is also a strong emphasis on self-sufficiency in waste disposal capacity, and on limiting transboundary movements of waste for disposal. While steps have been taken to limit the transboundary movement of waste for disposal, the European Commission has taken the position that limits on transboundary movements of waste within the EU for recycling or recovery may be unacceptable from a trade perspective.

Energy from waste projects have formed a significant part of some national waste management plans to date, particularly in Northern Europe. However, there is now growing

pressure within the European Union to re-classify incineration with energy recovery as waste disposal, as opposed to diversion.

Initiatives have been taken to standardize the gathering and reporting of statistics on waste management and diversion, and to establish consistent eco-labelling programs. Steps have also been taken to implement the requirements of the Basel Convention, and other international agreements on transboundary movements of waste.

In addition, there have been moves at the EU level to establish union-wide requirements for landfill facilities. These include minimum design requirements, full cost internalization in the pricing of landfill disposal, and the banning of the landfilling of problem materials such as organics and tires, and of the "co-disposal" of hazardous and non-hazardous wastes.

Finally, there is growing controversy within the EU about the impact on the internal of a number of member state's waste management initiatives, particularly those involving requirements for the reuse of packaging, producer responsibility and the application of economic instruments in waste management policy. This has led to move to develop an EU policy on the use of economic instruments and their relationship to the internal market.

III. THE DEVELOPMENT OF NATIONAL MUNICIPAL SOLID WASTE STRATEGIES IN EUROPE

1. Introduction

In Europe, as in North America, the progression of initiatives in the area of municipal solid waste diversion began with a focus on reducing packaging waste, particularly beverage containers. This focus expressed itself through the introduction of a variety of recycling/recovery programs (collection and processing) including pick-up and drop-off programs, both public and private, aimed at food and beverage containers, organics, and newsprint. The original approach was aimed specifically at waste disposal. This narrow focus has now broadened to encompass the entire life cycle of products and packaging and to include new "actors," including the manufacturers and distributors of products.

During the 1970's and 1980's, many countries establish recycling/recovery systems. However, a considerable portion of the materials collected were incinerated for energy recovery. In 1989/90 the EU Waste Strategy set out the guiding policy that reiterated the WM hierarchy. In 1991 the German Packaging Ordinance incorporated the "polluter pays" principle and established in European law the concept that producers could be made responsible to take back their used products and thus, to be responsible for their WM costs. This concept, and its expression in packaging laws and requirements, has spread to other countries and even up to the EU level, as demonstrated by the introduction by the EC of a Packaging Directive in late 1994.

2. Member States' Waste Management Strategies

Unlike North America, European countries often have completely unrelated systems for collecting different recyclable materials. Curbside collection programs often target paper, but seldom include glass. Paper, consisting of all grades or residential mixed paper and cardboard, is usually collected curbside. Glass is more likely to be collected in closed drop-off containers, sometimes called "igloos". These systems play a critical role in the high levels of materials recovery achieved in Europe. Closed drop-off containers for the collection of recyclables are common and are often clustered with individual containers dedicated to different materials including glass, plastics, and, rarely, paper or metal cans.

Collection is performed by municipal governments, regional solid waste authorities, companies in the materials markets themselves, service companies, or non-governmental organizations (NGOs) or semi-public corporations with an environmental, human service, or charitable mission. NGO or service organizations may perform collection services under contract to the municipal government, or they may receive a fee per ton collected, based on the avoided cost of disposal; generally they also keep some or all of the marketing revenues. Although some of these organizations must live from market income, their status as recognized elements of public recycling infrastructure means that they often receive

government compensation, sometimes in the form of diversion credits.

More intensive recycling collection efforts, particularly under aggressive recycling policy regimes in Germany and Denmark, began with attempts at wet-dry separation in the mid-1980s. These efforts have now progressed to separate collection of compostables on the one hand (formerly the "wet" fraction) and separate collection of paper and recyclables on the other. Recyclables are occasionally, but not commonly, commingled. Under the influence of producer responsibility requirements, there are increasing experiments with commingled collection of drink boxes and plastic containers.

Northern European countries are highly reliant on mass-burn incineration, coupled with energy generation. The fact that waste incinerators generate heat for district heating loops makes incineration with energy recovery particularly attractive in Northern European countries such as Denmark and Sweden. In these countries typically between 35% and 80% of the residential waste stream is disposed of through incineration.

The EU classifies incineration with energy recovery as a recycling/recovery operation but has recently considered changing this policy, at the urging of the European Parliament, to reclassify it as disposal, particularly where "insufficient" levels of energy are recovered. More recently, national policy and legislation for packaging and producer responsibility agreements specify distinct targets – one for energy recovery and another for "recycling" (the use of recycled materials as inputs in a manufacturing process).²²

i. Germany

Germany has established a progressive recycling and recovery system that is based fundamentally on the principles of polluter pays and producer responsibility. Recovery rates for 1993 are reported as 25% for the total waste stream (includes waste from households, small enterprises, street sweeping, mining, industry and c&d) and approximately 35% for municipal waste (waste from households, commercial and industrial).²³ Private sector institutions and organizations have been required to take back packaging and are now being required to take back other products.

ii. Denmark

Denmark's diversion system is based on source separation of materials and a significant product ban. In 1975 the Danish government enacted The Statutory Order on Packaging for Beer and Soft Drinks which is still in place in 1997. It obliges fillers and retailers to offer beer and soft drinks only in recyclable, standardized returnable and refillable containers. Single-trip cans are prohibited. The recovery rate for beer and soft drink bottles is 99.5%. An agreement between the Environment Ministry and the bottlers

and retailers has permitted the use of two standard PET returnable bottles since 1991.

A Statutory Order on Waste Disposal and Recycling came into force in 1990. It obliges local authorities to selectively collect and recycle glass, newspapers and other printed matter from private households, public authorities and businesses. No quotas were specified. This Statutory Order provides the basis for voluntary agreements with industry on the avoidance of waste.

The 1992 Danish *Action Plan on Waste and Recycling 1993-1997* prioritized recycling, which is followed by incineration with energy recovery and then landfill disposal. The Plan aimed to integrate the disposal costs into the product price in the future and to oblige manufacturers to recycle their products. It included legislation for mandatory collection of specific materials and a recycling target of 50% (excluding incineration with energy recovery) of all waste by the year 2000. The target includes construction rubble, industrial waste and printed matter.

The plan includes a variety of waste charges for products, packaging and disposal. Landfill disposal is to be reduced gradually until it is prohibited for combustible waste in the year 2000.

According to staff at the Danish Ministry of the Environment, the recycling rate was 61% (excluding incineration for energy recovery) in April 1997. However, another source states "... in Denmark there is no recycling because such waste is incinerated with energy recovery."²⁴ This discrepancy may be due problems with data comparability and with the way in which various operations are classified.

In Denmark Organic waste is collected separately from catering centers (15,000 metric tons in 1990) and from 220,000 households (50,000 metric tons in 1990) and composted.

iii. The Netherlands

In 1996, in order to fulfill the requirements of the EU Waste Directive, The Netherlands formulated its *Waste Management Program 1995 - 2005*. It prioritized waste reduction and recycling. Not more than 25% of the total waste stream (including industrial, C&D and all other wastes) is to be either landfilled or, preferably, incinerated. In 1993, 5.5 million mt of household waste was produced; 34% was reused or recycled; 38% was incinerated and 28% was landfilled. By 2005 the expectation was that 57% would be reused and/or recycled and 43% incinerated.

A target of 10% waste prevention is also part of the overall strategy, but is harder to measure and monitor.²⁵ In 1997 the rates were reported as: 61% recycled/reused; 20% incinerated with energy recovery; and 18% landfilled.²⁶ In October 1995 it was decided to

ban from landfill 30 waste streams for which better disposal routes were available.

Separate collection of kitchen and garden waste was established in 1992 and by 1997 all households were covered. Source-separated organic waste is currently composted. In 1995 approximately 1.4 million metric tons (mt) of organic waste from households was processed, a figure which is set to exceed 1.5 million mt per annum by 2005. Attention is now focusing on quality and marketability of the compost product.

The collection of other recyclables is carried out through collection containers in public areas, although some paper is collected from households. Collection of textiles is to be expanded. Targets by the year 2000 include: mixed paper - 85%; glass packaging - 90%; textiles - 50%.

Starting in 1997 all companies in the Netherlands will be obliged to separate their waste in order to facilitate recycling. The Dutch WM Agency, which brings together national, regional, and local authorities, is currently circulating draft regulations setting cut-off points for specific waste streams.²⁷ Companies whose waste generation exceeds the specified limits would have to ensure separation.

iv. Sweden

In Sweden, WM plans are devised at the municipal level. However, during 1996 and 1997 the Swedish Environmental Protection Agency (SEPA) has been formulating a national WM plan based on experience in municipalities. In 1996 Sweden hoped to recycle 15% of the waste stream (not including incineration with energy recovery). Sweden currently recycles a high percentage - 85% in 1991 - of aluminum beverage containers due to a deposit of SC .50 (US\$.08).²⁸

In 1996 The SEPA proposed a new waste plan that calls for a national landfill tax (250 SC/mt), stricter landfill requirements, and expanded recycling initiatives. In 1996 50% of Sweden's household and industrial waste, and 90% of "production waste" (including mine tailings) was sent to landfill and 50% of household waste goes to energy recovery. The 1996 plan called for compulsory separation of waste at source by 2000 and extended the 1989 deadlines for waste reduction.²⁹

v. UK

The UK has set a target to recycle 25% of household waste by the year 2000: the recycling target for the packaging industry is set at 50% by 2000 under a producer responsibility initiative.³⁰

3. Member States' Initiatives on Landfill/Disposal

Member states have been incorporating landfill restrictions in plans, proposals, and regulations despite of the fact that the EU has not yet produced a landfill directive.

i. Austria

Austria set a target to reduce landfill disposal of municipal waste to 50% by 1996.³¹ A comprehensive ordinance is being prepared which will include rules for the choice of sites, the technical operation and the control of landfills.³²

ii. Belgium

In Belgium charge is levied on dumping of industrial and municipal waste. The rate depends on the type of waste and prior treatment.³³

iii. Denmark

In Denmark, landfill disposal is to be reduced gradually until it is prohibited for combustible waste in the year 2000. Disposal charges are differentiated and now favor incineration. Landfill disposal is set at 295 DKK/mt in 1997, up from 195 DKK/mt in 1993. There are two incineration charges: the rate for incineration with heat production and electricity production is 160 DKK/mt in 1997; the rate for incineration with heat production only is set at 210 DKK/mt in 1997, up from 160 DKK/mt in 1993.

The landfill disposal of organic wastes is to be minimized as much as possible, in preparation for a ban on landfill disposal of combustible wastes from 1997 onwards. As of April 1997, 18% of the total waste stream, and less than 5% of the household waste stream, was landfilled.³⁴

iv. France

In France, a tax on landfill disposal rose to 25 francs (US\$4.50) per ton in 1995 and will gradually increase to 40 francs (US\$7.50) per ton by 1998. The revenue is used to fund innovative techniques of waste treatment and support the building of domestic waste treatment facilities or their rehabilitation.³⁵ In the year 2002 the landfill tax will end and only final waste will be accepted at landfill sites.³⁶ A tax was created in 1995 on all industrial waste that will finance the rehabilitation of contaminated sites.³⁷

v. Germany

In Germany, the Technical Instructions on Municipal Waste came into force in 1993 mandating, through a statutory ordinance. This ordinance requires that waste arriving at landfill must be pretreated (recyclables processed; compostables separated and composted; residues incinerated, etc.). In addition, landfill disposal is not allowed for waste with more than 5% organic content.³⁸

vi. The Netherlands

Reducing the amount of waste going to landfill and restricting the landfill disposal of untreated waste is a major aim of the Dutch WM strategy. In October 1995 the decision was taken to ban from landfill 30 waste streams for which better disposal routes were available, including paper, batteries, industrial waste, most combustible household wastes, and organic waste. For 21 of these 30 waste streams, the ban took effect in January 1996. In January 1997, exemptions to the first year's ban – including the residual streams from waste sorting facilities – were lifted. In early 1997, the landfill ban will be extended to cover the reusable and unsorted portions of C&D waste, and later in the year it will also include the combustible portions of C&D waste, and shredder residues. Landfill bans on the remaining waste streams will come into force during the period up to 2000.³⁹

In addition, charges apply to materials going to landfill, incineration, and composting facilities. In 1997 these were: 87 ECU per mt for waste going to landfill; 100 ECU per mt for waste going to incineration; and 30 ECU per mt for waste going to composting facilities. These are set to escalate up to the year 2005.⁴⁰ The landfill levy is equal to approximately \$US18 and is levied on everything dumped.⁴¹

vii. Sweden

The proposed SEPA WM plan would lead to safer and more efficient disposal of waste and would increase the cost of landfill disposal by 60% - 120%. A key objective would be to cut the amount of household and industrial waste (excluding "production waste" such as mine tailings) sent to landfills. In 1996 50% of Sweden's household and industrial waste, and 90% of "production waste" (includes mine tailings) was sent to landfill.

The 1996 plan tightened the requirements for landfill, including a ban on the landfill disposal of organic waste and the classification of landfills into 3 categories by waste content. The SEPA wants to see the proportion of household waste sent to landfill cut by 70% by 2005. The draft 1996 plan contained targets: landfill disposal of household waste to be cut by 50% by 2000 and by 70% by 2005; industrial, commercial, and C&D waste to be cut by 50% by 2000.⁴²

A 1995/1996 draft producer responsibility ordinance set targets for landfill restrictions as follows: tires - 60% reduction in landfill disposal by 1997 and 80% reduction to landfill disposal after 1998; electronic goods - 85% take back by the year 2000; car take back - less than 5% of weight to be landfilled or incinerated without energy recovery by 2015.⁴³

In 1996 Sweden introduced a landfill tax of SC 250 per mt. It has been suggested that this be increased in 1998 to reflect full costs of landfill disposal.⁴⁴

viii. United Kingdom

The UK adopted a landfill tax (levy) which became operational in October 1996. The stated objectives of the tax are to: ensure proper pricing of landfill disposal; apply the polluter pays principle; and promote a more sustainable approach to WM. The levy is 5 British pounds per mt.⁴⁵

4. Conclusions

A number of major themes are emerging in the development of national waste management strategies within the EU, particularly among the leading Northern European countries. Most of the strategies include specific targets for waste diversion and the recycling of specific materials, and incorporate a hierarchy of waste reduction, recycling, incineration with energy recovery, and landfill disposal. There is increasing emphasis on producer responsibility programs for both packaging and products.

A number of member states have established curbside collection programs for organic wastes and paper. Other materials, such as glass and plastics are usually dropped-off by residents at neighbourhood collection centres. Collection is performed by municipal governments, regional solid waste authorities, private sector companies or non-governmental organizations.

Several member states, including France, Germany, and Sweden, have already moved toward requiring the treatment of waste (i.e. recyclables processed; compostables separated and composted; residues incinerated) prior to landfilling. Others focus on landfill disposal charges. A number of member states have also introduced limits or guidelines for biodegradable waste going to landfills. The Netherlands has gone significantly further, introducing landfill bans on a wide range of other materials, including paper, batteries, industrial waste, and construction and demolition wastes.

IV. PACKAGING WASTE DIVERSION

1. EU Directive on packaging and packaging waste

In 1994, in response to the German packaging legislation that was having an impact throughout the EU, an EU Directive on Packaging and Packaging Waste (94/62/EC) was adopted after long discussion. It came into force with the requirement that it be implemented in national legislation within 18 months. The Directive sets recycling and recovery targets for packaging waste over the period 1996 - 2001, with a view to a revision during the five year period on the basis of experience gained in the member states. Member states have the flexibility to select appropriate systems for themselves.⁴⁶

The Directive prescribes targets that have to be met in national legislation within 5 years in all member countries, with the exceptions of Portugal, Ireland, Greece, and some small islands, which have until 2005. These countries must attain a recovery rate of at least 25% by 2001. Member states who wish to exceed the proscribed maximum limits and have adequate recovery capacities may pursue higher targets.

The Directive pertains to all packaging material from both residential and industrial sources. The main elements of the Directive include:

- * the harmonization of national measures. The Directive establishes measures to reduce the final disposal of packaging waste. It also calls for measures that do not impede the free circulation of goods within the Community;
- * comprehensive definitions of packaging in terms of primary and transport packaging, prevention, reuse, recovery, recycling, energy recovery, organic recycling, disposal, economic operators, and voluntary agreements;
- * requirements that member states implement measures to prevent packaging, including voluntary agreements with industry;
- * permitting member states to implement reuse systems;
- * targets of between 50% as a minimum and 65% as a maximum by weight of packaging waste must be recovered; within this target between 25% as a minimum and 45% as a maximum by weight of the total packaging materials must be recycled, with a minimum of 15% by weight for each packaging material. Energy recovery is not counted as recycling;
- * requiring the establishment of collection and recovery systems in member states. These systems can include both private operators and public sector authorities and apply to both domestic and imported packaging. Systems must be designed to avoid barriers to trade or distortions to the internal Community market;

- * stipulations that the Council shall devise a packaging marking system to facilitate collection, reuse and recycling, within 2 years;
- * the establishment of compliance, reporting, and dispute resolution mechanisms;
- * mandating the establishment of community packaging standards;
- * stipulating restrictions on heavy metals content in packaging materials;
- * requiring the establishment by member states of databases on packaging and packaging wastes;
- * requiring member states to establish public information programs;
- * stipulating that member state WM plans include a chapter on packaging;
- * allowing member states to adopt economic instruments that follow the 'polluter pays' principle.⁴⁷

The date for member states to implement the EU's directive on packaging and packaging waste was 30 June 1996. However only a small handful met this date.⁴⁸

2. Member State's Packaging Initiatives

The first and trend-setting packaging initiative was undertaken in Germany. Member states have been enacting national laws in response to Germany's 1991 initiative and to ensure compliance with the 1994 EU Directive. The European Commission screens these laws to ensure there is a balance between the competing demands of environmental protection and the European single market.

i. The 1991 German Packaging Ordinance

Sparked by scarce disposal capacity in Europe's largest economy and most populous member state, the German initiative was an ambitious program for collecting and recycling product packaging. It centered on the establishment of an obligation to accept returned packaging from customers. Distributors have been obliged to accept returned transport packaging since December 1991, either for re-use or recycling. Retailers have had to accept returned secondary packaging since April 1992 and returned sales packaging since January 1993.

Manufacturers and retailers have set up a private sector (separate from the municipal WM system) recycling organization - Duales System Deutschland GmbH (DSD) - to fulfill their obligation to accept used packaging. Producers paid weight-based fees to the company

based on the type of packaging, to cover the costs of collecting and recycling their materials. The packaging is marked with a green dot to demonstrate that it has paid its fee and is part of the system. The DSD system has been criticized as an unwarranted interference in the economics of the market system and praised as a way to internalize the 'external' costs of WM in the price of goods.

The Ordinance set stringent recovery targets for each packaging type and established compliance dates. By 1993 DSD was to have recovered 50% of all sales packaging on the domestic market. 57% was collected. Approximately 85% of this was recycled. According to the DSD, the amount of packaging consumed has dropped by almost one million metric tons since the introduction of the Ordinance. The DSD feels that this demonstrates the effectiveness of internalizing WM costs in the product price.⁴⁹

Environment Watch Western Europe reports that annual consumption of one-way packaging in Germany fell by more than 1.3 million metric tons between 1991 and 1995 as a result of the packaging decree.⁵⁰ However, a recent statistical analysis of collection rates challenges the recovery figures and reports that targets are not being met.⁵¹ Additionally, many of the materials collected were not recycled as inputs to re-manufacture but were either burned for energy production or exported.

In 1996 the German government amended its Packaging Ordinance to bring it line with the 1994 EC Packaging Directive and to deal with internal problems. The DSD system experienced problems with insufficient market capacity and high costs and this contributed to a financial crisis. By the end of 1993, DSD owed 982 million Deutsche marks (DM) to municipalities, WM companies and industrial companies. These parties turned their bills into a credit (essentially a loan) enabling DSD to survive. In 1994 and 1995, the DSD was able to produce surpluses. This improvement in DSD's financial situation came about through a new licensing structure introduced in 1994. Individual material fractions now have a fee based on both weight and volume, and which takes into account the actual WM costs for each material.⁵²

In 1996, due to continuing problems related to the poor quality of collected materials, insufficient treatment and market capacity, "free riders"(producers and distributors who did not join the DSD), and higher than expected costs, the German government has scaled back some recovery targets and extended the deadlines for compliance for such materials as plastics, glass, aluminum and tinfoil. This is to allow more time for utilization capacity to be developed.⁵³

The planned revisions also seek to put a stop to the problem of free riders by requiring producers and distributors that do not join the DSD to produce evidence that they are meeting the recovery targets. In addition, in order to promote greater competition the DSD will, in the future, have to call for tenders before awarding contracts for collection, sorting, and recovery of waste. It will also have to publish the costs of handling each packaging material. The revisions will bring the scope of Germany's decree into line with

that of the EU directive by covering packaging containing dangerous substances as well. As of November 1996 the proposal was awaiting approval from the German Parliament.⁵⁴

ii. Austria

Austria's packaging decree came into force in October 1993 and was revised in 1995. In its 1995 form it set an ultimate recovery/recycling target for all packaging waste of 80% by volume, to be met by July 1999. This target is obligatory for companies that have not joined Austria's packaging recovery organization (ARA). With regard to individual packaging materials, the decree sets recycling rates of 95% for ceramics and metal, 93% for glass, 90% for paper/cardboard, 40% for plastics, and 25% for composites, all to be met in 1996. The rate for composites will go up to 40% in 1997. The decree allows for incineration with or without energy recovery, but only under the condition that the waste goes to hazardous-waste incinerators.⁵⁵

In what was seen as a major threat to the packaging decree, in 1996 Austria's highest court lifted an obligation on 2 retailers to take back and separate packaging. The court also ruled that if the decree was not amended by November 1996, the obligation would be lifted on all retailers. This gave the government until 30 September 1996 to change the legislation. The government considered changes to the decree and the country's WM law, including the provision of a special task force to take action against free riders, and allowing for the establishment of competitors to ARA. However, disagreements within the government coalition made it impossible to change the legislation before the court rulings came into effect.⁵⁶

iii. Belgium

An industry/government agreement on packaging, was to have been implemented at the end of 1996. It set stricter recycling/recovery targets than the EU Directive and had earlier timelines. In 1996 50% of packaging was to have been recovered and 35% recycled; in 1997 the rates are 60% and 40% respectively; for 1998, 70% and 45%; and for 1999, 80% and 50%.⁵⁷ The agreement required industry to draw up packaging waste prevention plans including measures to increase reusable and recyclable packaging and to reduce one-way packaging. It also introduced a general take back obligation.

For consumer packaging, this requirement is increasingly being discharged by an organization set up by the packaging sector in 1993. This company has negotiated contracts with a number of public agencies and local authorities and plans to expand its geographical coverage. A controversial system of eco-taxes on beverage packaging means that beverage containers must be either refillable or recycled at higher rates than the general recycling rate set by the agreement. The recycling rates will rise annually to reach 80% for glass and metal containers and 70% for plastics and beverage cartons in 2000.⁵⁸

iv. Britain

Britain missed the deadline for incorporating the EC directive into its national laws due to disagreements within the packaging industry over how to apportion producer responsibility. The government had originally proposed a total recovery target of 58%, with incineration with energy recovery accounting for 8% and recycling for the remainder. It may relax this target due to insufficient or unacceptable incineration capacity. A British industry organization, responsible for developing recovery systems, announced that it is drafting a business plan for a four-sector organization to be considered by industry, with the aim of establishing a system by the end of 1996.⁵⁹

v. Denmark

Denmark has had ban on the use of cans as beverage containers since 1975. Beer and soft drinks can only be marketed in recyclable containers and metal containers. The recovery rate for beer and soft drink bottles is 99.5%.

In 1988 the EC Court of Justice approved this ban on metal containers. However, in 1996, in response to a possible EU legal challenge to the can ban, Denmark's environment minister notified the Commission that he planned to loosen the ban by opening the Danish market to aluminum cans as an alternative to bottles. Steel cans would remain banned.⁶⁰

In 1991 the Danish government signed a voluntary agreement with industry to recycle 80% of transport packaging by the year 2000. The agreement will oblige municipalities to collect transport packaging. A similar agreement was signed with the glass industry in 1994 commits the industry to recycle 30% of single-trip glass packaging. Municipalities are already required to collect glass for recycling. Denmark studied the DSD packaging concept but concluded that the costs would be prohibitive.

Denmark also taxes packaging. Packaging charges are material- and volume-based and are applied to glass bottles, plastic bottles, beverage cartons, beverage cans for non-carbonated drinks and milk cartons. Disposable tableware charges equal 50% of wholesale price excluding VAT.⁶¹

Two pilot collection projects for plastic packaging were carried out in 1996.⁶² Following preliminary results the Danish government has decided to focus efforts on plastic transport packaging because transport packaging comprises more than 50% of the packaging waste stream. The 1991 packaging ordinance obliging municipalities to collect plastic transport packaging will be amended. Municipalities will have more flexibility and will be allowed to delegate collection obligations to industry where appropriate. The statutory ordinance enacting the change was expected in early 1997.⁶³

vi. Finland

In 1994 Finland introduced a tax on beverage packaging which is independent of the deposit on refillable bottles. The purpose of the tax is to help increase the returnable fraction. The tax is levied on both one-way and refillable containers. The tax is independent of the weight or volume and is set at 3 Kroners for beer, carbonated soft drinks and wine and spirits, and is set at 0.30 for juice and non-carbonated soft drinks. An additional tax of 0.70 Kroners is levied on one-way beverage containers.⁶⁴

vii. France

France has two pieces of legislation in place that it considers will meet the requirements of the EC Packaging Directive. One covers household packaging waste, while the other covers packaging waste from businesses and industry. The 1992 household packaging decree makes municipal authorities responsible for collecting and sorting packaging waste – along with other household waste – but obliges manufacturers, importers, and distributors to arrange for the recovery of the separated packaging materials, either by setting up their own system or by participating in a joint recovery organization.

As of 1996, 3 such organization existed. The most important is Eco-Emballages, which handles all kinds of packaging. Its Green Dot mark can be found on 90% of consumer products in France. Adelphé specializes in wine and spirits packaging, while Cyclamed handles packaging from the pharmaceutical sector.⁶⁵

Eco-Emballages expected to recover 1 million mt of packaging waste in 1996 – 50% was to have been recycled, 50% was to have been incinerated. By 2003 the organization aims to recover at least 75% of all packaging waste, with 75% going to recycling and 25% to incineration with energy recovery. It also aims to achieve a recovery rate of no less than 60% for each type of packaging material, and to reach 95% of French households.⁶⁶

With regard to non-household packaging waste – in particular, transport packaging such as pallets – a 1994 decree aimed to achieve a 100% recovery rate by imposing a take back and recovery obligation on the final users of such packaging. A number of joint recovery organizations have been established.⁶⁷

Existing French bottle refund systems ensure that 90% of wine and spirit bottles and 98% of beer bottles or non-alcoholic beverage bottles are refilled or recycled. The contents of one-way bottles are charged with an extra fee, the revenue being earmarked for the financing of waste oil collection.⁶⁸

viii. The Netherlands

In 1996 the Netherlands already met most of the EU Directive's diversion targets. The Netherlands is the process of negotiating a new agreement with industry and of drafting a new regulation in order to implement the EU Packaging Directive and to meet the targets of its own 1991 packaging covenant.

The 1991 agreement, which was voluntary, set a target of 90% recovery, with 60% recycling for the year 2000. It also called for the amount of new packaging to be reduced to below 1986 levels by 2000. The new agreement that was being negotiated with industry in 1996 would set steeper targets: 75% recycling and 35% incineration with energy recovery by 2001. In line with the first negotiated agreement, the government has proposed that the entire packaging chain – including producers, importers, retailers, and recyclers – share responsibility for meeting the targets, rather than individual companies.⁶⁹ The new draft regulation includes monitoring and reporting requirements.

The new agreement, combined with the pending regulation on packaging was expected to bring The Netherlands into compliance with the EU directive by October 1996. In 1996 the country was reportedly recovering almost 100% of its packaging waste; 50% is recycled and the other 50% is incinerated for energy recovery; landfill disposal of packaging waste has been prohibited since January 1996.⁷⁰

ix. Norway

Norway's approach to complying with the EU directive includes taxes and negotiated agreements with industry. Norway imposes a per-unit scaled tax ranging from 0 to 3 Kroners (US\$ 0.46) on all beverage containers. The level of the tax is inversely proportionate to return levels, down to a very low levy on refillable bottles for which the return rate is 98%. There is an additional tax of 0.70 Kroner (US\$ 0.11) on all non-reusable beverage containers except cartons, although this is being challenged as a trade barrier.⁷¹

Negotiated agreements with industry cover all other forms of packaging, aiming to achieve collection rates of 60% to 80% by 1999. Return systems for households and businesses are to be set up this year. Recovery and recycling rates are: 30% for plastics with at least 50% going to incineration with energy recovery; 60% for polystyrene with 50% recycled; 60% recovery for metals; 60% recovery for cardboard with 50 going to recycling; 80% of brown paper with 65% going to recycling; and, 60% recovery for beverage cartons. Under the agreements, industry has to finance the return systems and establish nonprofit companies to run recycling facilities. If the targets are met the government will not interfere with the system; otherwise it might consider imposing taxes on other types of packaging.⁷²

x. Sweden

In 1996 the Swedish government introduced draft legislation to replace the existing national packaging ordinance, that aimed to bring Sweden's existing packaging waste regulations into line with the EU directive in terms of both terminology and targets. The draft also introduced recovery targets for packaging made of wood or textiles. It was to be supplemented by a separate decree regulating the heavy metal content in packaging. New recovery/recycling targets, to be met by 2001, are (by weight): aluminum – 70% recycling;

aluminum beverage packaging - 90% recycling; paper/cardboard - 70% recovery with 40% recycling; corrugated cardboard - 65% recycling; plastics (except PET bottles) - 70% recovery with 30% recycling; PET bottles - 90% recycling; tinfoil - 70% recycling; glass - 70% recycling; wood - 70% recovery with 15% recycling; and, other materials - 30% recovery with 15% recycling per material. The targets can be met through both material recycling and incineration with energy recovery.⁷³

3. Conclusions

Efforts to divert packaging waste among European countries began with the introduction of deposits on beverage containers in the 1970's. More recently, following the lead of Germany's 1991 packaging ordinance, producer responsibility requirements for packaging wastes are becoming increasingly widespread among member states of the EU.

Generally, producer responsibility systems require manufacturers or retailers to provide for the recycling or reuse of waste packaging, and to internalize the cost of these services. Programs are being expanded to include transport as well as retail packaging.

Producer responsibility requirements for packaging are being implemented through both regulatory requirements and voluntary industry-government agreements. However, the latter have usually developed in the context of a threat of stringent government regulation.

V. PRODUCER RESPONSIBILITY

1. Introduction

The genesis of the concept of producer responsibility in WM policy can be traced to the 1991 EU Priorities Waste Stream Programme, the German Packaging Ordinance of 1991, the Danish Action Plan for Waste and Recycling 1993 -1995, the Swedish Eco cycle Bill of 1993, and the German RWMA of 1994 (described in the next section). The policy initiative that stimulated the most discussion about the principle of polluter pays and by extension, the concept of producer responsibility, was the German Packaging Ordinance of 1991. The concept has now become widely accepted and is finding expression in recent European WM laws, policies, and industrial agreements.

The concept of producer responsibility essentially extends the take-back principle from packaging to products themselves. Financial and material responsibility for waste management is shifted away from local authorities and back to the producer. The incorporation of the true cost of WM makes it financially more attractive for producers to design products that are easier to disassemble, reuse, and recycle. It is anticipated that this will ensure easier handling of materials at the end of their consumer lifespan, the use of smaller quantities of materials, and the use of safer, more energy-efficient materials. The overall result should be a reduction in resource use and waste generation.⁷⁴

The general structure of producer responsibility programs place financial responsibility for recycling and disposal on the product and/or package manufacturer. Most systems encourage industry to form one or more recycling corporations, which guarantee a market for the collected materials. Some systems, like that in France, allow industry to make use of public sector WM infrastructure, usually for a fee, with the goal of capturing private funds to build or enhance public recycling capacity.

2. Germany's Recycling and Waste Management Act

The 1994 German *Recycling and Waste Management Act* (RWMA) is described by the German Ministry of the Environment as the Closed Substance Cycle and Waste Management Act on the basis of product responsibility directed towards waste avoidance. This Act codified producer responsibility and set the stage for a fundamental changes in WM policy. This Act is having an impact at the EU level and among other member states similar to that of Germany's 1991 Packaging Ordinance.

The Act, which came into force in 1996, specifies who is responsible for what and incorporates the polluter pays principle. The scope of the Act is very broad. Waste is defined broadly as everything which arises in production, manufacture, or processing, including the generation of substances which were not the original intention of the process.⁷⁵ Effectively, the Act separates all goods circulating in an economy into only two categories – on the one

hand products, and on the other hand, waste.

A legal obligation for product responsibility will be enacted if the voluntary guideline for innovation on the part of trade and industry is not met. Waste recovery is stipulated where it is technically possible for the party concerned and economically viable. In each individual case priority is given to the most environmentally sound form of recovery. The German government is authorized, through a statutory ordinance, to determine which is the more environmentally sound type of recovery for individual kinds of waste. It has the right to prescribe for what waste, in what quantity, and under what conditions, material recovery is to be preferred over energy recovery. Recovery of energy from waste by combustion is only permitted if the calorific value of the waste recovered is at least 11,000 kJ/kg, the firing efficiency of the plant is at least 75%, and the heat generated is used. Disposal must be carried out in an environmentally-sound manner that is set out in other statutes.⁷⁶

The RWMA provides for a range of possibilities for producers to fulfil their responsibilities, such as through associations. However, it contains stringent provisions to ensure that private associations perform their tasks properly. Associations must submit a WM concept and fulfill monitoring and reporting requirements. The monitoring procedure for waste recovery has been deregulated to be more flexible and a quality label is offered to operators who submit to voluntary independent monitoring.⁷⁷

Batteries, capacitors, scrap cars, building rubble, scrap electronic components, and waste paper are high priorities for the application of the principle of producer responsibility in Germany.⁷⁸

In 1994 in an early reaction to the Act, the German paper industry committed itself to achieve 60% recovery rate for paper by the year 2000. In 1996 the automotive industry agreed to take back and recycle used cars.⁷⁹ In both cases the relevant sectors anticipated an impending statutory ordinance to regulate WM activities in their sectors. Thus, the Act has resulted in a changes private sector behavior that have made enforcement measures unnecessary.

A voluntary commitment by the construction and demolition (C&D) waste sector foresees that by 2005 signatories would cut the amount of recoverable C&D waste they send to landfill by 50%. The German environment ministry has stated that this means that up to 23 million mt of such waste will be turned into new building materials and products each year instead of being landfilled. The agreement involves a large part of the construction and building materials sector, plus architects, engineers, and demolition firms. An advisory committee will oversee its implementation and report back to the ministry.⁸⁰

Germany is drafting an electronics waste ordinance. As of 1996 it did not specify recovery or recycling targets and timelines although, like Sweden, it calls for mandatory industry participation in product recovery and recycling.

3. Other Member States' Producer Responsibility Initiatives

i. Austria

In Austria, legislation mandates take-back schemes for batteries, light bulbs, refrigerators. A take-back scheme PVC window frames and plastic piping is organized by industry on a voluntary basis. A voluntary agreement between the motor vehicle industry and the government was in force on the take-back of scrapped cars until the end of 1995.

ii. Denmark

Waste reduction through the use of cleaner technologies was the first priority under the Danish Action Plan for Waste and Recycling 1993-1995. These cleaner technology efforts have a life-cycle focus. A framework agreement on electronic scrap was expected in summer 1996 to be implemented through voluntary schemes for each sub-sector. The information technology and consumer electronics sectors have already submitted proposals for voluntary schemes.⁸¹

The Danish government also hoped to formulate producer responsibility with several other industrial sectors including the automobile sector. However, as of April 1997 the government was still negotiating end-of-life agreements with industry. The government had wanted signed voluntary agreements with industry but it is likely that traditional methods – i.e., regulations – will be required. Ministry staff expects regulations by the end of 1997.⁸²

iii. France

In France, legislation and voluntary producer responsibility agreements are in preparation for packaging materials, used tires, vehicles, capacitors, electronic equipment, and paper.⁸³ The French government has proposed a target of recovering all electronic scrap by 2002 but is awaiting the results of several pilot projects before deciding how to proceed. France has not been supportive of producer responsibility at the EU level.⁸⁴

iv. The Netherlands

As of 1996, the Netherlands had producer responsibility agreements for: car scrap (voluntary plus financial incentives); packaging waste (voluntary and statutory agreements); consumer batteries (voluntary, backed up by statutory laws); car tires (statutory); plastic construction materials (voluntary plus financial incentives); electronics waste, and agricultural plastics (statutory).⁸⁵

At the request of the Dutch car industry, the Dutch government introduced a surcharge on new cars to finance mandatory end-of-life vehicle recycling. There is no fee

to the consumer for delivering a car to the ARN but a fee of NLG 250 (US\$ 180) is paid on every new car.⁸⁶

A draft decree in The Netherlands has established a product take-back goal of 100% by the year 2000 for electric and electronic products with recycling targets for specific materials and reuse targets for specific products. By the year 2000 90% materials reuse will have to be achieved for white goods (refrigerators, washing machines, and dishwashers), 70% materials reuse for brown goods (televisions, videos, computers, and telephones) and other appliances (sewing machines, vacuum cleaners, and coffee makers).⁸⁷

Under the proposed legislation producers and importers of home appliances and consumer electronics would have to take back their products free of charge. The take back obligation would cover products sold after it comes into force as well as older equipment. For larger items it would become effective 1 January 1999; for smaller products, the target date is 1 January 2000. The new legislation will permit industry to impose a surcharge on the price of new products to help fund take back schemes. The ministry could make such a surcharge mandatory for the entire sector if asked to do so. The draft also includes a ban on the landfill disposal or incineration of collected products, although residues from recovery processes may be burned.⁸⁸

v. Sweden

EPR was one of the most important new concepts introduced in the Swedish Eco-cycle Bill. The Swedish Environmental Protection Agency (SEPA) has been participating in the EU's priority waste streams project on electronic waste that presented its findings in 1995. The Swedish Eco-cycle Commission was established in 1993 to work with representatives of industry to formulate producer responsibility agreements.

The various industrial sectors are approaching the problem in different ways. The electronics industry is organizing itself into environmental councils, the construction industry is investing in research, the tire industry asked for and obtained legislation on producer responsibility, while the Association of Swedish Automobile Manufacturers and Wholesalers advocated a voluntary commitment from all manufacturers and importers.⁸⁹

During 1994 and 1995, national producer responsibility ordinances have been enacted for mixed paper, packaging, and tires and an agreement for cars is being finalized. The packaging ordinance has been revised and redrafted following the EU Packaging Directive.

Producer Responsibility targets have been set as follows: tires - 60% reduction in landfill disposal by 1997 and 80% reduction to landfill disposal after 1998; electronic goods - 85% take back by the year 2000; car take back - less than 5% of weight to be landfilled or incinerated without energy recovery by 2015. At the same time the Swedish Environmental Protection Agency is assessing the following materials flows: metals (iron and

steel, copper, aluminum, zinc, nickel chromium); plastics; textiles; paper and wood; cement and concrete.⁹⁰

In March 1995, the SEPA proposed a draft Producer Responsibility Ordinance for all electronic and electrical products and a recovery scheme. The SEPA advocates mandatory regulations no later than January 1, 1998. The draft regulations are said to place responsibility on the distributor/retailer.⁹¹ The proposal allows EPR to be enforced retroactively, i.e., for products already on the market and would likely be funded by a surcharge on new products.⁹²

By January 2000 the agency wants 85% by weight of electrical and electronics waste to be collected and managed in a more environmentally benign manner (as opposed to incineration or landfill disposal). This means that hazardous substances must be removed and disposed of appropriately and that plastic components must be recycled if possible. The scheme also includes an eco-labeling scheme, enforcement requirements for existing regulations, and research into making products and their components easier to reuse and recycle.

Following a proposal by the Ecocycle Commission, the Swedish Motor Vehicle Recycling Act should enter into force on January 1, 1997. This will replace the Motor Vehicle Disposal Act. The new Act's goal is that motor vehicle manufacturers and importers should assume joint responsibility for recycling of end-of-life vehicles.⁹³ Producers already have retroactive physical and economic responsibility for tires under a separate ordinance; their responsibility for cars will also be retroactive and include all vehicles irrespective of the year of manufacture, in order to create a strong incentive to develop vehicles that can be profitably recycled.

A vehicle disposal charge is already levied on producers in connection with the registration of new vehicles to partly finance the payment of a vehicle disposal premium to the last owner, new vehicles financing the disposal of old ones through a rolling fund system. However, it is intended that take-back also apply to vehicles marketed before the introduction of the new system. Thus, the Vehicle Recycling Fund will be financed by the state until all end-of-life vehicles represent a source of profitable raw materials, at which time the scheme will be 100% producer financed.⁹⁴

vi. Switzerland

The Swiss Government has presented draft legislation requiring retailers, manufacturers, and importers of electrical and electronic goods to take back used products while giving them flexibility over the means of recovery or disposal. The government hopes that the new decree will come into effect by the beginning of 1998.

In its present form the decree would allow industry to impose a surcharge on the

price of new products to cover recovery costs. Consumers would be exempt from this if they bought a replacement product after returning their old one. The government is retaining the option of making the surcharge mandatory if parts of the sector fail to introduce it.

The government says it wants to give industry as much leeway as possible in its choice of solutions. The draft does include guidelines for the "reasonable minimum treatment of waste" as follows:

- * parts containing polluting substances such as polychlorinated biphenyls and mercury, as well as products such as nickel-cadmium batteries must be separated and disposed of in appropriate facilities;
- * the metal contents of products can be separated and taken to specialized recycling plants; and
- * non-recyclable plastic and other parts should go to waste incineration.

The draft also provides for controls on exports of electronics waste, similar to existing controls on hazardous waste exports. In Switzerland, an estimated 110,000 mt of consumer electrical and electronic products are thrown away each year. In 1995, only 20,000 mt were processed by specialist firms.⁹⁵

vii. UK

The UK motor vehicle, tire, battery, electronic equipment, newspaper and packaging industries have been asked to significantly increase recovery and recycling of waste under producer responsibility agreements.⁹⁶ In 1997 Producer Responsibility regulations were in place in Britain for packaging and it is likely that the electronics sector will be the next focus.⁹⁷

4. Conclusions

Originally introduced in relation to packaging wastes, the concept of producer responsibility is now being increasingly applied to products as well. Germany has again been the leader within the EU on this issue. Automobiles and electronic equipment have emerged as the highest priority targets for producer responsibility systems. However, programs are also beginning to develop in a number of states for household appliances, tires, batteries, construction and demolition wastes and other products.

Producer responsibility systems are largely being implemented through voluntary industry-government agreements, although these are usually backed by a threat of regulatory action by government. A number of the proposals which have emerged would establish retroactive producer responsibility for products which were sold before the establishment of a producer responsibility system.

VI. SUMMARY AND CONCLUSIONS

A number of key themes have emerged in the development of waste management policy at the European Union level. These include the establishment of requirements for national waste management strategies, with specific goals and targets for diversion. A waste management hierarchy of prevention, reuse, recycling, recovery of materials, energy recovery and final disposal has been adopted.

There is also a strong emphasis on self-sufficiency in waste disposal capacity, and on limiting transboundary movements of waste for disposal. However, the European Commission has taken the position that limits on movements waste within the EU for recycling or recovery may be unacceptable from a trade perspective.

Energy from waste projects have formed a significant part of some national waste management plans to date, particularly in Northern Europe. However, there is now growing pressure within the European Union to re-classify incineration with energy recovery as waste disposal, as opposed to diversion.

Initiatives have taken place to standardize the gathering and reporting of statistics on waste management and diversion, and to establish consistent eco-labelling programs within the Union. Steps have also been taken to implement the requirements of the Basel Convention, and other international agreements on transboundary movements of waste.

In addition, there have been moves at the EU level to establish union-wide requirements for landfill facilities. These include minimum design requirements, full cost internalization in the pricing of landfill disposal, and the banning of the landfilling of problem materials such as organics and tires, and on the "co-disposal" of hazardous and non-hazardous wastes.

There is growing controversy within the EU about the impact of a number of member state's waste management initiatives, particularly those involving requirements for the reuse of packaging, and producer responsibility schemes. This has led, among other things, to the development of an EU policy on the use of economic instruments in environmental policy.

Several major themes are emerging in the development of national waste management strategies within the EU as well, particularly among the leading Northern European countries. Most national strategies include specific targets for waste diversion and the recycling of specific materials, and incorporate a hierarchy of waste reduction, recycling, incineration with energy recovery, and landfill disposal.

A number of member states have established curbside collection programs for organic wastes and paper. Other materials, such as glass and plastics are usually dropped-off by residents at neighbourhood collection centres. Collection is performed by municipal governments, regional solid waste authorities, private sector companies or non-governmental

organizations.

Several member states, including France, Germany, and Sweden, have already moved toward requiring treatment (i.e. recyclables processed; compostables separated and composted; residues incinerated) of waste prior to landfilling. Others focus on landfill disposal charges. A number of states have also introduced limits or guidelines for biodegradable waste going to landfills. In addition, the Netherlands has established landfill bans on a wide range of other materials, including paper, batteries, industrial waste, and construction and demolition wastes.

Efforts to divert packaging waste among European countries began with the introduction of deposits on beverage containers in the 1970's. There are several types of economic instruments being used in the context of packaging reduction. They include eco-taxes designed to discriminate against certain products; mandatory deposits to penalize non-refillable beverage containers, or as a sanction for failing to achieve recovery targets, and product levies applied by industry or government to reflect actual recovery costs.

More recently, following the lead of Germany's 1991 packaging ordinance, producer responsibility requirements for packaging wastes are becoming increasingly widespread among member states of the EU. Generally, producer responsibility systems require manufacturers or retailers to provide for the recycling or reuse of waste packaging, and to internalize the cost of these services. Programs are being expanded to include transport as well as retail packaging. Producer responsibility requirements for packaging are being implemented through both regulatory requirements and voluntary industry-government agreements. However, the latter have usually developed in the context of a threat of stringent government regulation.

The concept of producer responsibility is now being increasingly applied to products as well packaging. Germany has again been the leader within the EU on this issue. Automobiles and electronic equipment have emerged as the highest priority targets for producer responsibility systems. However, programs are also beginning to develop in a number of states for household appliances, tires, batteries, construction and demolition wastes and other products. As has been the case with packaging with producer responsibility systems for products are largely being implemented through voluntary industry-government agreements, backed by a threat of regulatory action by government.

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