

APPENDIX A

OVERSEAS EXPERIENCES IN MANAGEMENT OF USED PACKAGING MATERIALS

A1 THE SYSTEMS

A1.1 EUROPE

In Europe, funding systems have been put in place to achieve a large-scale increase in the percentage of packaging collected, sorted and recycled in order to meet arbitrary percentage targets imposed by law. These targets apply to commercial and industrial packaging waste, as well as to used packaging from household sources.

The 15 European Union (EU) member states fall into four categories:

- Those facing an urgent waste disposal problem, which introduced packaging recovery targets and systems as a matter of national policy (e.g. Belgium and Germany).
- Those which introduced targets and systems to ensure that their own recycling infrastructures were not undermined by the importation of German packaging waste which was made available free of charge or even with a ‘dowry’ attached (this was the French motivation and also the United Kingdom’s starting-point, though in the United Kingdom this was overtaken by events).
- Those which have achieved high diversion rates without the need for funding systems, through infrastructures which internalise costs (Denmark and the Netherlands).
- Those which have had no national policy reason to set tough recycling targets and which have adopted legislation purely to meet their EU obligations (e.g. Spain and Portugal).

The European Commission (EC) Packaging and Packaging Waste Directive adopted at the end of 1994 covers all packaging placed on the market within the EU, but it is up to the member states to take measures to ensure that the percentage recovery and recycling targets are met.

The Directive does not require all companies to contribute. Individual companies are simply responsible for complying with whatever legal requirements are laid down at national level. In practice, though, the Directive has accelerated acceptance of the idea that all companies should be making a contribution.

The ‘Green Dot’ and Similar Systems

The classic way of setting up a ‘system’ to raise money from participants and disburse it to achieve the objectives is the ‘Green Dot’ system used in much of Europe. Brand owners pay a licence fee for use of the on-pack Green Dot symbol which shows that they are making a financial contribution to the management of packaging waste from households. A ‘Green Dot organisation’ administers the monies and disburses the revenues to fund collection systems.

The Green Dot countries are Austria, Belgium, France, Germany, Luxembourg, Portugal and Spain - they include some of those with the most ambitious recycling targets (Austria, Belgium and Germany) as well as some which are seeking to go no further than EU legislation demands (France, Portugal and Spain).

Broadly similar arrangements are in place in Finland, Norway and Sweden, except that the Green Dot symbol is not used.

Why Brand Owners?

The Green Dot system started as an industry initiative in Germany. In the late 1980s the Federal Government issued a steady stream of regulations and non-statutory edicts which it expected industry to follow for fear of unspecified further action. Key players within the packaged goods sector responded by devising the ‘Dual System’ - a private sector system to take complete responsibility for dealing with used packaging arising from households. Leading brand owners were willing to do this because they believed that this would put them back in control of their own destinies. The retail trade made sure that the plan was driven through: the retailers would have been most affected had the Government’s threat of in-store take-back been implemented. Without the retailers’ input it is not clear whether all materials and product sectors would have signed up to the plan.

Austria’s system was designed with considerable help from German officials, and followed the same basic principles.

In France, packaging waste management was not the political issue it was in the German-speaking countries, but here too the brand owners were keen to take charge of the Green Dot scheme. They were concerned to show that the objectives of the system could be achieved more cost-effectively than in Germany. They were worried that the emphasis on recycling all packaging materials in Germany would result in hard-to-recycle materials either being banned or being priced off the market, reducing their freedom to choose the most suitable packs for their products. Reflecting this, the French Decree on household packaging waste places its obligations on packers/fillers and importers and a number of other member states adopted the same principle.

Although the brand owners pay the Green Dot fees, it is not true that the Green Dot system involves a ‘single-point obligation’. Brand owners are not just packer/fillers. Retailers pay the Green Dot fees in respect of imports and own-label products. In most jurisdictions, packaging manufacturers pay the fees for point-of-sale packaging (carrier bags, delicatessen wrappers etc).

And the packaging manufacturers are bound into the system, either by law or by contract, through their commitments to take back specified or unlimited quantities of post-consumer material provided it meets specification.

Why Not Place the Legal Obligation and/or Funding Burden on Retailers?

A levy would be most transparent and simple to operate if imposed at the interface between the packaging chain and the consumer - namely, at the retailer. A 'checkout levy' would be relatively simple to administer, in that it would automatically include imports and exclude exports. There would be no need for cross-checking to avoid levy payments being evaded or double-counted. In principle, it also involves members of the packaging chain in only one set of payment arrangements (between the company paying the levy and the organisation collecting it) whereas a levy at an earlier stage involves two (with the organisation collecting the levy and with the customers to whom it is passed on). Consumers, unlike business customers, do not generally negotiate terms.

There is no need for the price of every product to be increased by the value of the smallest coin (5c in Australia). The choice would be to:

- aggregate the levies attributable to all packaging handled and show the total as a separate item on the consumer's till slip (tills could be programmed to show the total of the levies payable on each unit sold); or
- treat the levies paid as just another operating cost and set retail prices according to strictly commercial criteria. This is the more likely.

Involving wholesalers as well as retailers would reduce the burden on the enforcement authorities that would result if maybe 100 000 retailers selling through 250 000 outlets had to be monitored. However a checkout levy would not have the enforcement backstop offered by a levy earlier in the chain. Commercial pressure from the retail trade can reinforce a legal obligation on packers/fillers and importers but there is no equivalent pressure which can be brought to bear on retailers and wholesalers.

Whatever the system, packaging manufacturers will be involved in respect of their recycling operations. If the legal obligation and funding arrangements are centred on the packer/fillers, this part of the chain also has a role, and retailers are caught in respect of their private label sales and direct imports.

But with a checkout levy, packers/fillers and importers are by-passed. They have no part in reprocessing operations (except maybe as specifiers of packaging with recycled material content) and no part in raising the levy. With no responsibilities, they are not part of the system and have no reason to identify with its success or failure.

No jurisdiction has targeted the retailer *per se* for implementation of packaging waste management legislation.¹ There is no objection in principle - throughout Europe and North America it is fully accepted that the retail sector is a part of the packaging chain. The problem is one of practicality:

- in the Australian context, the constitutional difficulty of introducing a levy at State level which could be regarded as an excise tax; and
- the undesirability of bypassing the packer/filler who is most likely to be the packaging specifier.

It is however possible to involve the retailer in respect of the total amount of packaging he handles if some form of 'shared responsibility' is put in place.

Shared Producer Responsibility

On the mainland of Europe in Austria, Belgium and Germany, trade and industry have *total* responsibility for packaging waste management. In that context, 'shared responsibility', the approach taken elsewhere in Europe, means sharing costs between industry and local government. This is an important distinction - if the private sector takes on total responsibility, this is a permanent cost burden, whereas a commitment to fund the additional costs of separate collection and sorting may turn out to be only a temporary cost.

The European Commission takes no position on whether the packaging chain should have total or partial responsibility. Each member state can decide that for itself. However, it says that:

*producers, material suppliers, distributors, consumers and public authorities all have waste management responsibilities, but the product manufacturer has a predominant role since his decisions largely determine his product's waste management potential.*²

United Kingdom and Ireland

In the United Kingdom and Ireland, 'shared responsibility' has a second meaning. It is assumed that the local authority waste collection and disposal services will continue. It is also assumed that industry's financial and operational contribution to recycling is about providing a boost to push waste management from the traditional pattern (where waste is disposed of unless there is an economic reason to re-use or recycle it), to a new way of thinking in which disposal is the last resort. It follows that once this transition has taken place, there may be no further need for industry subsidies. Thus 'sharing' responsibility between the private sector and the public

¹ The in-store take-back requirement in the German Packaging Ordinance, which would come into effect if DSD failed to meet its targets, was intended as a mechanism to ensure that retailers put pressure on their packer/filler suppliers to take part in the Green dot system.

² Review of the Community waste management strategy, July 1996.

authorities is implicit. The British and Irish only talk about ‘shared producer responsibility’ when they want to stress the involvement of all parts of the packaging chain, rather than just the branded goods manufacturers who are often singled out by packaging legislation.

The packaged goods industry in the English-speaking member states was much less sanguine about bearing the burden of taking primary responsibility for meeting the targets than their Continental colleagues. The fear was that they would be able to pass on none of the extra costs to the powerful retail chains.

United Kingdom

With no agreement in sight between the various parts of the packaging chain, an independent study was commissioned. This was carried out by a QC who was a former chairman of the Monopolies and Mergers Commission. The study proposed that packaging manufacturers should in principle be responsible, but with certain rights to pass on responsibility to packer/fillers. The packaging manufacturers were equally afraid that they would not be able to pass on the cost to their customers, and pointed out (with some justice) that any levy would constitute a far higher proportion of packaging manufacturers’ total turnover than of packer/fillers.

Thus the idea of ‘shared responsibility’ emerged. Many of those involved in the discussions found it hard to take on board that a task-based sharing of responsibilities already existed in the Green Dot countries, where brand owners look after the collection and sorting aspects and the packaging industry the reprocessing and expansion of end-use markets. The packer/fillers in particular saw only where the Green Dot fees were levied not the contractual and legal obligations on the reprocessors. Thus the United Kingdom approach was not to share out the tasks, but to divide each task according to some formula.

The Regulations eventually implemented placed a duty on every individual company above the thresholds to meet its share of the targets, either through individual action or through collective activity. Raw material producers bear 6% of the responsibility, converters 11%, packer/fillers 36% and sellers to the final end-user (whether the end-user is a private household, a business or the public sector), 47%.

Thus by January 1999 a packaging manufacturer must hold certificates from a recycler showing that material equivalent to 4.18% of his output of converted packaging (i.e. 11% of the 38% interim recovery target) has been reprocessed on his behalf. ‘Reprocessing’ means recycling (which includes composting) and energy recovery. The packaging manufacturer would also carry a 36% obligation as the packer/filler of the transport packaging he uses, and a 47% obligation as the supplier of this transport packaging to the end-user.

This 38% recovery target is not material-specific, but within this overall target, the obligated company must also meet a recycling target applicable to each of the packaging materials used. Thus if it produces plastics packaging and ships it out in board, it will have a responsibility of 0.77% (i.e. 11% of the 7% interim recycling target) for the plastics packaging it produces, and 5.81% (i.e. 36% + 47% of the 7% interim recycling target) for its board transport packaging.

Importers pick up a legal obligation for any activities that have previously taken place outside the United Kingdom. Thus a packer/filler of imported converted packaging will take on the material producer's and packaging manufacturer's obligations as well as his own obligations as a packer/filler and as a supplier.

Money is intended to flow into the system through the issue of Packaging Recovery Notes (PRNs). Individual companies or collective schemes can purchase PRNs from reprocessors (recyclers or energy recovery facilities) as evidence that they have taken responsibility for ensuring that a certain tonnage of packaging material has been recovered. The idea is that recyclers will pay attractive rates for collected material, in order to be able to use the material to sell PRNs.

This system is not working well, and is already being reconsidered within the United Kingdom but in any case is far too costly and complex to be appropriate for Australia's needs. The principal objections to it are as follows:

- It involves very high overheads, at the centre and within individual companies, since the system is dependent on provision of reliable data. In the Green Dot countries, only the manufacturer responsible for placing the packaged product on the market is responsible. In the United Kingdom, forms have to be completed and payments made at four stages, and information has to be passed up and down the chain. For instance, a can manufacturer needs to know whether its customer or its customer's customer has exported any beer packaged in its cans, as exported product should be deducted from his obligations.
- The idea of the careful mathematical share-out was 'fairness', but this is illusory. Companies in a strong bargaining position can negotiate away the costs of their obligations with their suppliers and/or customers, and the converse applies to the weak. Also, because this complex system would impose a severe cost penalty on small companies, the obligations do not apply to companies handling less than 50 tonnes of packaging p.a. or with a turnover less than A\$10 million (A\$2 million from January 2000).

The PRN system does not necessarily generate funds. It was invented as a means of injecting money into the system by Valpak, the largest compliance scheme. Valpak is writing into its PRN purchase contracts requirements about how the reprocessors spend the money. However, these are commercial contracts which could be enforced only through expensive court action. Other schemes and individual companies which purchase PRNs are not specifying how the money is spent.

Further, a powerful customer may insist that its packaging supplier gives it PRNs free of charge. Issuers of PRNs are not obliged to spend the revenues on expanding recycling facilities. It is known that some are taking it as compensation for what they have spent developing recycling in earlier years. In the Green Dot system, by contrast, fee income is spent supporting local authority collection and sorting, and does not cross supplier/customer relationships.

Ireland

The Irish system of shared responsibility is less complex. Ireland, along with Greece and Portugal, has been set much lower targets in the Directive (25% recycling + energy recovery by 2001, and no per-material recycling target) and there are no targets for collective organisations in its Regulations. Targets are agreed privately as part of the approval process for these organisations (as in the French Green Dot system). Companies, whether importers, manufacturers and distributors of packaging material, packaging or packaged products, which do not want to take on the additional obligations imposed on individual compliers, may join a collective organisation which will act on their behalf, contributing to the funding of Kerbside Dublin and to glass collection through Bottle Banks.

The collective organisation, REPAK, charges fees on a turnover basis, but hopes to move to a material-specific fee structure in 1999. The turnover-based fees make no distinction between different parts of the chain, and so hit high-value products like whiskey much harder than low-value products like bleach, and also bear proportionately on retailers and packer/fillers (where packaging is only part of what they are selling) than on packaging manufacturers. This will be rectified when the more refined funding system comes into play.

Like the United Kingdom, Ireland exempts small players from these obligations, which apply only to companies placing more than 25 tonnes of packaging per year on the Irish market and having a turnover exceeding A\$2 million. The Green Dot countries, by contrast, have no legal thresholds, but it is understood that they will not pursue companies when the costs of bringing them in exceed the revenues to be gained.

The Netherlands

The Dutch approach (Covenant plus back-up legislation) has some lessons for Australia, and is examined in more detail in section A1.4. However, there are important differences between the two countries. The Netherlands is a densely populated country with a high water table and consequent shortage of landfill sites. Government, industry and the public are agreed that waste minimisation is a major environmental priority. There have been some bad experiences with air pollution from dirty incinerators in the past, and few are keen to see an expansion of energy-from-waste capacity.

The second generation Dutch Covenant involves some funding commitments, but these are small by European standards. The Dutch see no need for a Green Dot symbol or any other central funding arrangement, as any recycling deficits will be small enough to be internalised. The factors that make this so are specific to the Netherlands:

- the landfilling of packaging is banned by law, so is not an option;
- high-yield energy recovery is permitted but gate fees make it more expensive than recycling;
- the public sector is sharing responsibility; and

- sorting costs will be minimised.

Thus the idea is that the scheme will actually save local governments money by guaranteeing to take back household packaging waste provided it meets specifications. Where the material has a value, industry will pay it. Thus for glass, the maximum cost to local governments will be A\$50 per tonne, against landfill costs which average A\$172 per tonne and can be as high as A\$290 per tonne.

The Government accepts that the first Covenant has resulted in reduced municipal spending on waste management and so accepts the principle of shared responsibility. Local authorities will be responsible for the collection of household waste and for the incineration of contaminants. Industry will be responsible for delivering the collected materials to the reprocessor. Research into the best way of recovering energy from used plastics packaging will be shared between the public and private sectors.

Trials of separate collection systems were carried out and it was concluded that segregated home collection of plastics, metals and beverage cartons in bags involved high cost for little ecological benefit: a 1.7% diversion rate cost A\$162 million per annum, so this will not be continued. Since separate collection of the lightweight packaging fraction from households is not economic, it is planned that metals will be separated at incineration plants, with some 'bring' collection also. Plastics from household waste will be incinerated with the other refuse, except where market demand justifies separation or separate collection is needed in order to meet the targets; and beverage cartons will be collected through 'bring' systems.

Much of the household plastics waste would go to power stations for use as a fuel, doubling or trebling the amount of electricity currently obtained from refuse in the Netherlands. Deducting the value of the feedstock from recovery costs, the overall deficit should be no more than marginal.

The ultimate aim is that packaging should become both an integral part of a company's environmental management system, and an integral part of the country's material waste management system. Then, once the second Packaging Covenant has come to the end of its life – at the end of 2001 – packaging should disappear from the political agenda.

A1.2 NORTH AMERICA

Canada

Geographically and socially, Australia has much more in common with Canada than with Europe. Like Australia, Canada is seeking industry funding to support kerbside collections of packaging and other materials available in large quantities in the household waste stream (newspapers, for example). By contrast, European legislation focuses on the collection and recycling *only* of packaging, but irrespective of whether the packaging waste arises in the household waste stream or on commercial/industrial premises.

Other things being equal, therefore, Canadian experience would provide a better guide. However, Canada does not as yet have the breadth and diversity of experience available in Europe.

Environment Canada and the ten Provincial Environment Ministries set a target of reducing municipal solid waste by 50% between 1988/9 and the year 2000. A National Packaging Protocol was drawn up as part of this program. The 50% target reduction also applies to packaging, and interim targets were set to reduce the packaging sent for disposal to 90% of the base level by end 1992, 80% by end 1994, 70% by end 1996 and 60% by end 1998.

At the time the 50% target was introduced, packaging legislation focused strongly on beverage containers, and Container Deposit Laws are still an important policy instrument. Alberta, British Columbia, Saskatchewan and the small Atlantic provinces of New Brunswick, Newfoundland and Nova Scotia have CDLs on all beverages except milk. The big provinces of Ontario and Quebec, and also Prince Edward Island, have CDLs on beer and soft drinks. Manitoba has voluntary deposits on beer bottles and cans. Containers are usually returned to 'bottle depots' which redeem consumers' deposits on the empties (and charge the bottlers/canners a handling fee which is typically 1.50c-3c per container).

There are also various mechanisms by which consumers' beverage purchases fund multi-material recycling. New Brunswick pioneered the 'half-back' deposit system under which consumers pay a 2c deposit on beverage containers, but receive only 1¢ back when they return the empties. The remaining cent is used to fund recycling programs for non-beverage containers. This raises nearly A\$15 million per annum from a population of 750 000.

'Half-back' systems are also in place in Newfoundland, where consumers pay a 6c deposit and get 3c back (20c deposit and 10c refund on liquor containers). They are also in place in Nova Scotia, the Yukon (10c deposit and 5c refund on containers up to 1 litre, 35c deposit and 25c refund on 2-litre PET), and on Prince Edward Island (for wine and liquor).

'Half-back' is intended to compensate local governments for material revenues they lose through aluminium and PET containers being diverted away from the Blue Box programs and returned through the deposit system. Since these are the only really valuable materials in the waste stream, the effect of the mandatory deposit system is to ensure that the revenues from Blue Box

collections are negligible. When Newfoundland announced its 'half-back' scheme late in 1996, the province's Environment Minister promised that the system would be self-financing, with no cost to government. At the same time, Nova Scotia was finding that despite the province's 940 000 consumers paying out A\$11 million in deposits, the cost of running the system was such that only A\$530 000 was left to compensate the municipalities.

Manitoba has a 2c tax on non-deposit beverage containers which is intended to fund multi-material collection systems. This raises A\$5.25 million per year from a population of 1.1 million. Manitoba is now in the process of extending this tax onto other forms of packaging and paper fibre products. The new rate is expected to be much lower than 2c.

As of mid-1996, 80% of collection costs in Winnipeg, capital of Manitoba, were funded from the recycling tax, and the program was not costing the municipality any money provided market prices for recyclables did not fall from the average A\$63 per tonne they were fetching at the time. Ontario has a 10c tax on beer cans. In Saskatchewan, in addition to the mandatory deposit of 10c-40c charged on each beverage container, consumers pay an additional 5c-7c container recycling fee which is added to the price of the product.

Ontario was the first province to introduce multi-material kerbside collection. OMMRI (Ontario Multi-Material Recycling Incorporated) was formed in 1986 to manage the beverage industry's contribution to the development of this system. In return, the Government lifted the ban on aluminium cans and PET bottles. OMMRI agreed to contribute A\$21 million between 1987 and 1990 to fund the procurement of Blue Boxes for each household to use to set out their used packaging, recycling vehicles and processing equipment such as balers, conveyors and magnetic separators. OMMRI also helped fund publicity for the program and provided technical advice on collection system design and marketing the collected materials, but did not otherwise contribute to direct operating costs. As a general rule, OMMRI contributed one-third of these costs, matching the contributions of the Ministry of the Environment and the local authority.

Once the beverage industry's original commitment had expired, the intention was that broader-based industry funding would be sought. By 1992 the need for this was urgent. It had originally been expected that once the five-year development phase was over, funding from OMMRI and the provincial government would no longer be needed, as the revenues from the sale of materials would cover operating costs. In fact markets for secondary materials remained weak, and municipalities were typically receiving an average of A\$32 per tonne for materials it cost A\$190 to collect through the Blue Box system. By this time local governments were paying 60% of the costs, the Ontario government 22%, and industry just 4%, with the remaining 14% covered by the sale of materials. Many municipalities were threatening to cut back or abandon their Blue Box program unless a new funding arrangement could be introduced.

Other provinces were also looking at industry funding for kerbside collection, and industry leaders were anxious that this should be done on a harmonised basis. Hence CIPSI (the Canadian Industry Product Stewardship Initiative) was put forward to establish a set of common principles, while still allowing some flexibility to take account of local conditions.

In 1994, when the CIPSI proposal was finalised, OMMRI served more than 80% of Ontario households by the kerbside collection system. 460 000 tonnes of material were collected at a cost of A\$91 million (A\$200 per tonne)³ – 39% of this was packaging and 61% ‘other recyclables’ (newspapers and magazines). 33% of the funding came from the provincial government, 39% from the municipalities, 13% from the sale of packaging materials, 9% from the sale of other materials and 5% from OMMRI grants. Regulations adopted earlier that year required all but the smallest local governments to put recycling programs in place by mid-1996.

In the first two-year phase, CIPSO (the funding organisation within CIPSI) would have paid the local governments a flat A\$69 per tonne for all qualifying materials. In Phase 2, local governments’ share of the costs would have been held to one-third, with industry funding the rest. Industry would have paid the ‘true cost’ of each material. The industry payment would have been calculated on the basis of an efficiency benchmark, the ‘operating cost standard’, according to the formula:

$$\text{payment} = \text{operating cost standard} - \text{revenue from sale of material} \\ - \text{local authority share}$$

Thus the total cost to the municipality would depend on its own costs above or below the operating standard and its actual revenues from the sale of collected materials.

CIPSO would have been funded by the brand owners, or in the case of imports, the first company in the province to sell the packaged product (by the packaging manufacturers in the case of point-of-sale packaging). In the first two years there would have been a flat A\$25 per tonne levy based on the overall weight of packaging used by the company in Ontario. Members of CIPSO would have been eligible for rebates of up to 50%, based on the average collection and recycling rate for each packaging material.

Material-specific levies would have been introduced from year three. If no agreement could be reached on how to allocate true costs by material, a default formula would have come into play. This would have calculated an average levy, based on the total packaging obligation to municipalities, adjusted up or down according to the effective recycling rate for each material.

The CIPSI proposal, like the Australian Covenant, envisaged a regulatory safety net to catch free riders. Provinces would adopt legislation requiring companies not joining the system to establish and fund a method of diverting at least 50% of their packaging waste from disposal, and submit a plan to the authorities showing how this target would be achieved. Non-CIPSO brand owners would not have access to the municipal recycling system.

CIPSI first foundered in Manitoba, where local manufacturers were unwilling to take on the financial burden implicit in a plan devised by national trade associations and major companies from out-of-province. Municipalities were disappointed with the level of funding commitment offered by the scheme. Government at all levels was concerned at the lack of public control and

³ This is CIPSI’s estimate of the 1994 *gross cost*. The Recycling Council of Ontario says that municipal recycling programs in the province are now diverting around 507 000 tonnes of material per year at a *net cost* of A\$91 per tonne.

accountability of the proposed industry funding organisation. Some commentators have suggested that the Manitoba Government would never have been satisfied with anything other than a program funded by industry but run by the Government. Hence the beverage container tax (see above) was introduced instead.

In the key province of Ontario, CIPSI failed largely because of timing. The proposal arrived on the Cabinet table just as the Government changed from the New Democrats, which had a very prescriptive approach to legislation, to the Conservative Party. Significant industry players who had not been part of the CIPSI process seized the opportunity to challenge the concept. The electronics industry was particularly unhappy about the requirement to report sales data, a very sensitive issue in that sector. To these newcomers to the issue, and to small business in general, CIPSI was seen not as a self-regulatory body charging membership dues, but as an unelected and unaccountable organisation which would effectively have quasi-taxation powers.

The economic viability of the Blue Box program continues to be controversial – is it or is it not a burden on public funds? – and the Recycling Council of Ontario recently put forward four options to the Ontario Minister of the Environment:

- 1) Status quo – the system is funded by the municipality through property taxes and user fees on householders (unacceptable to local government);
- 2) Provincial funding from a tax on specified products or containers at point of sale, or from a levy per product or container paid by packaged goods manufacturers and importers (probably unacceptable to the provincial government, which believes that this is a local issue for which provincial subsidy is inappropriate);
- 3) Industry funding of a portion of municipal costs through voluntary or legislated industry contributions (a revival of the CIPSI model);
- 4) A 100% industry-funded and operated kerbside recycling program, or industry funding for municipal recycling while operating complementary recycling systems such as a deposit-return system for liquor and wine containers (more or less the Belgian model).

The report notes that these options are not mutually exclusive, since user fees (Option 1) and deposit-return systems (Option 4) are compatible with municipal recycling funded through environmental levies under Options 2 or 3.

The Association of Municipal Recycling Coordinators has put forward another option:

- 5) Packer/fillers, importers and retailers to pay 50% of municipal collection and handling costs for 1998 and 1999; municipalities to continue to operate the Blue Box system but industry to part-fund the system (a cost-plus formula unlikely to be acceptable to industry).

More and more local governments across Ontario are moving either to garbage bag limits or to ‘pay-as-you-throw’.

According to the Canadian Soft Drink Association, the shift to a two-bag limit in Barrie led to a 35% increase in diversion from its waste disposal site. Whitby cut their bag limit from eight to four per week and helped generate a recycling tonnage which was 50% higher than in the previous year.

‘Pay-per-bag’ fees range from C\$1 to C\$2.50. On average the result is a 50% reduction in the waste put out for disposal, and a 50%-150% increase in recyclables recovery as well as increased use of composting facilities.

The United States

Up to now, US jurisdictions have legislated on packaging waste management with a much lighter touch than in Europe. The physical environment has more in common with Australia than with Europe, and they have demonstrated that market-based mechanisms can be made to work provided they are properly designed and the targets are realistic.

Table A.1: United States Recycling Performance

U.S. RECYCLING	% OF TOTAL MSW BY WEIGHT		
	HOUSEHOLD SOURCES	COMMERCIAL SOURCES	TOTAL RECYCLING
Corrugated boxes	0.1%	8.7%	8.8%
Newspapers	3.4%	0.1%	3.5%
Office paper	-	1.6%	1.6%
Other paper	1.5%	0.5%	2.0%
Glass containers	1.2%	0.3%	1.5%
Steel cans & appliances	1.0%	0.9%	1.9%
Aluminium cans	0.4%	0.1%	0.5%
Plastics packaging	0.4%	-	0.4%
Rubber & leather	-	0.2%	0.2%
Textiles	0.2%	0.1%	0.3%
Wood packaging		0.7%	0.7%
Yard waste	3.3%	0.2%	3.5%
Other	0.3%	0.9%	1.2%
TOTAL	11.8%	14.3%	26.1%

Source: J Winston Porter, ‘Recycling in America’ (1996)

If collection is subsidised, but demand for collected materials does not increase, the situation will continue to deteriorate. Industry will be asked to take a bigger and bigger share of the costs, and losses will mount as unprofitable schemes grow.

Restricting collection to materials which have a buoyant end-use market is the most economic solution. This is the approach which tends to be adopted in jurisdictions where waste management costs are internalised (Denmark and the Netherlands, as well as the USA). It may mean less focus on household packaging waste than legislators would like – used board and

plastic film from commercial sources being among the easiest materials to collect and reprocess – but it is how the United States has achieved its 25% recycling target (see table A.1).

Apart from Container Deposit Laws (CDL) and laws imposing Advance Disposal Fees (ADF) in a few states, state legislation has tended to concentrate on mandating local government recycling effort rather than requiring industry funding for municipal collection programs. Thus a few states banned certain types of packaging from landfill but exempted those cities and counties which had an ‘effective’ recycling program. Some states require municipal collection of designated types of packaging, or set recycling targets to be met by a due date. These targets usually had an ‘aspirational’ character rather than being backed by penalties for non-achievement.

CDLs are in place in nine states: Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, New York, Oregon and Vermont. They originally covered only beer, carbonated soft drinks and waters, but some states have extended their scope to other beverages (though not to milk). No new CDLs have been adopted since 1983, though several states have extended the coverage of their mandatory deposit systems since then.

CDLs operate alongside any municipal collection systems, and do not contribute to their funding (indeed, they divert relatively high-value material into this parallel system). There have been a number of legal battles over the ‘escheats’ principle, which declares that unredeemed deposits are the property of the state, rather than remaining in the hands of the originator of the deposit (the soft drink bottler or beer wholesaler).

From October 1993, Florida law imposed a 1c ADF on every bottle, can, jar or beverage container of 5 oz - 1 gallon, unless a 50% recycling rate was achieved by July 1993 or the container had the following minimum recycled content: glass 35% (50% by 1998), plastics 25%, and paper 30% by 1994 (40% by 1997, 50% by 2002). From January 1995 the ADF was increased to 2c, but the law’s sunset provision came into effect in October 1995 and the system came to an end.

In its first year of operation, aluminium and steel cans were exempted from the ADF as they met the required 50% recycling rate. By mid-1994, 105 companies had petitioned for exemption by certifying that they would meet either recycled content or material recovery goals by July 1996: these exemptions, which included virtually all soft drink containers, all glass made or filled in the US and all milk cartons, represented more than 70% of containers subject to the ADF.

There was something of a conflict between the twin aims of raising revenues for environmental purposes and encouraging recycling and the use of secondary raw materials. In the first full year of implementation, the ADF generated nearly A\$67 million. In its second and final year, thanks to the exemptions, revenue fell to A\$39 million. All the money flowed into a Solid Waste Management Trust Fund, but only 12% of it was spent on recycling (specifically, improving recycling markets).

In any case, the law does not appear to have had much effect on recycling trends within the state. Although Florida was the only state to have such legislation, its recycling rates 'approximate national averages, with some exceptions'. The recovery rates for aluminium cans and PET carbonated soft drink containers are less than the national average. On the other hand, the recovery rate for steel cans in Florida is greater than the national average.'⁴

Since 1995, the Florida legislators have been keen to make savings in their recycling program wherever they can. The recycling and education grants program was discontinued in 1996, saving A\$34 million annually – it was argued that with the state's municipal solid waste recycling having risen from 4% to 33% over the life of the program, the main objective had already been achieved. A Bill has now been introduced into the State Senate to discontinue recycling in counties with a population of less than 50 000 (31 of Florida's 67 counties fall into this category, but they account for only 1% of MSW).

In California, fillers have to pay a recycling fee into a state-administered fund for every aluminium, glass and plastic beer or soft drink container they sell in the state. This fee now stands at 2.5c into the fund for containers of up to 24oz, and 5c for larger sizes (i.e. PET). On returning the empties to redemption centres, consumers receive 5c for one large bottle or two small packs.

The law also requires glass manufacturers to pay a 'reprocessing fee' which in 1992 amounted to A\$38 million, less than 1c (US) per bottle. Plastics avoided a A\$24 million fee by instead guaranteeing a floor price for PET bottles. And because operators are paid by the state, there is little incentive to improve collection and sorting efficiencies.

Legislation prescribes a minimum recycled content for glass containers which rose from 15% in 1992, through 35% in 1996 to 65% in 2002. By 1995, all rigid plastic packaging holding between 8 oz and 5 gallons either had to be reusable 5 times, reach a 25% recycling rate, contain 25% post-consumer content or be source-reduced (e.g. light-weighting) by 10% over 5 years. Material substitution does not count towards the source reduction target. Even if the overall target is not met, any company's products are deemed to comply if they meet the criteria. 'Easily-recycled' products like milk jugs or soft drink bottles had to achieve a 45% recycling rate by 1995, either on a company basis or generically. PET bottles had to achieve 55% recycling, but this recycling rate would count towards the overall plastics recycling target. In return, the state was obliged to offer beverage container kerbside collection to 60% of single-family households by 1994.

Similar provisions apply in Oregon, where the law stipulates that cities only have to pick up used plastics from households if stable end-use markets exist which pay at least 90% of collection costs.

By early 1996 there were nearly 7400 kerbside collection schemes and more than 9000 drop-off recycling programs across the US. There were also around 2800 local government programs with variable rate pricing systems, for as program costs have expanded, there has been more and

⁴ Source: Second Annual Report of the Florida Packaging Council.

more interest in finding new ways of paying for solid waste collection, recycling and disposal that reflects true costs.⁵

‘Pay-as-you-throw’ pricing systems can be based either on weight or volume:

- In volume-based systems, householders are charged according to the level of service they subscribe to, i.e. the number of cans or bags they leave out at the kerb each week, or else they buy special garbage bags at a price which covers collection and disposal costs.
- In weight-based systems, trucks are fitted with scales and bar codes to track addresses – a study by the Institute of Public Affairs, University of South Carolina⁶, comments that this offers greater perceived fairness but is costly to implement.

Another mechanism, tried by the City of Tacoma, Washington State, rewards householders for increased recycling by giving rebates on waste collection fees according to the neighbourhood’s recycling rate.

The South Carolina study identifies the following variables which affect the success of a variable rate pricing program:

- the charging structure (there should be a small price differential between the charges made for collection of solid waste on the one hand and recyclables on the other⁷);
- whether recyclables are collected at kerbside or at drop-off centres (kerbside collection increases householder participation by 15%-25% and as it generates higher yields at higher cost);
- whether or not collection containers are provided by the municipality;
- whether recycling is mandated or voluntary; and
- the willingness of a community to recycle (which is usually related to household income, gender and education level).

A1.3 SOME PRICE SUPPORT SYSTEMS IN OPERATION

⁵ Sources: Skumatz (1996), *National Diversion Rate Study - Quantitative effects of program choices on recycling and green waste diversion*; Steuteville (1996), *The state of garbage in America*.

⁶ *Forecasting change in the effectiveness of local recycling programs: a predictive model* (1997).

⁷ German experience suggests that if the differential is too great, the recyclables collected will be badly contaminated with waste that should have gone into the garbage collection.

European experience shows the importance of avoiding ‘cost-plus’ financial support. It is essential that payments are made according to a formula which gives the local authority every incentive to seek continual improvements to its operating efficiency.

Belgium

FOST Plus, the Green Dot recovery organisation, was running projects covering half the population at the end of 1997 and plans to collect packaging nationwide by 2000. In 1998 it expects to recover about 1.05 million tonnes of used packaging, two-thirds of the total non-reusable packaging placed on the Belgian market.

Glass is collected through bottle banks (at least 1 site per 1 000 inhabitants and separated into at least 2 colours). There is a monthly door-to-door collection by waste paper merchants of paper and board along with old newspapers and magazines; and there is a twice-monthly multi-material door-to-door collection of the lightweight materials, including beverage cartons, using blue transparent plastic bags, sold through retailers at A\$1.25 per bag. Belgium also has some 400 guarded container-parks, where all three fractions can be brought.

Local authorities decide what to collect themselves and what to sub-contract. They all sub-contract sorting of the lightweight fraction (metals, plastics and beverage cartons), but collection of materials is evenly divided between direct and sub-contracted collection.

Since the whole population contributes via the Green Dot licence fees (which are reflected in consumer prices) but only part of the population benefits from intensive collections, there is a temporary (up to 5 years) subsidy for the rest of the population. Any amount of household packaging collected through any system gets A\$16 – A\$400 per tonne support against a written statement of sale of recycling. The scale of payments is the same as that applied to all FOST Plus support before the ‘full cost’ rule was introduced in September 1995:

Table A.2: Payment Scale Applied to FOST Plus Before 1995

MATERIAL	A\$ PER TONNE
Glass	20
Paper/board (packaging only)	20
Steel (magnetic extraction from incineration or composting)	16
PVC, PET and HDPE containers	400

Contracts with the contractors who carry out the physical collections are awarded by competitive tender, so the prices quoted will vary according to whether the area is urban or rural, the population density, typical size of family, etc. The contract price includes the cost of transporting the material to the designated reprocessor.

The reprocessors’ organisations have given a ten-year guarantee that material meeting quality specifications will be accepted for reprocessing. Where a local authority wishes to handle the collection itself, a price is negotiated with FOST Plus which takes into account the local situation

and the results of competitive tenders in areas where conditions are similar. Contracts have so far mainly been awarded to the cheapest bidder, although quality criteria, such as references or relevant experience, and transport costs to reprocessing plants, are also taken into account.

Once the contract has been awarded, FOST Plus pays the contractor directly for each tonne of material collected and sorted, based on information about tonnages supplied by the *intercommunale* (group of local governments), and cross-checked with tonnages received by reprocessors. Paper and board packaging is collected together with other waste paper. It is assumed that 25% of this is packaging, so the contractor is paid by FOST Plus for a quarter of the total amount collected, the rest being funded by the local authority. The local authority receives 75% of the revenue from the sale of the paper to reprocessors, with 25% going to FOST Plus.

The plan is that there will be only one contractor per 'market', i.e. for each material per *intercommunale*. Contracts are awarded for five years except the contracts for delivering the bags to collect the PMC fraction which are shorter. Costs in September 1997 were as follows:

- the average cost of glass collection through 'bring' containers had increased from A\$71 per tonne in 1995 to about A\$84– though this was significantly less than for kerbside collection;
- paper/board is collected together with newspapers and magazines. FOST Plus pays for 50% of the weight of these collections, which by coincidence was also an average of A\$84 per tonne (unchanged from 1995);
- the lightweight fraction (plastic containers, metals and beverage cartons) is collected together at an average cost of A\$360 per tonne (A\$458 in 1995). This high cost is due to the relatively low weight of these materials and the need to sort them after collection, a task which costs about the same as collection. A further cause of these high costs is mis-sorting by the public and inclusion of non-packaging items in the sacks; and
- the cost of collecting all materials (counting 50% of the paper/board only) and of sorting the lightweight fraction was A\$192 per tonne of material, or A\$9.50 per inhabitant per year. This is three or four times lower than in Germany, which FOST Plus ascribes to uniform collection arrangements, the option of putting collection out to competitive tender, and the gradual development of the projects. As expected, there is a certain correlation between collection costs and population density.

Despite the development of kerbside collection, 'bring' systems continue to develop in Belgium, albeit not focusing specifically on packaging. The new Flemish waste management plan requires every community with a population of over 10 000 to have a container park. The proposed Walloon plan also aims to increase the number of container parks and to make them available to small businesses as well as the public.

The areas working with FOST Plus have container parks to complement the kerbside collection. FOST Plus has decided that the plastic/metal/beverage carton fraction can be collected in these

‘bring’ containers together in one sack just as for kerbside collection. This is to simplify the message and to ensure uniformity of collection arrangements.

Results as of January 1997 were as follows:

- 80%-90% of consumers with access to intensive selective collection were using it;
- the new projects were collecting and sorting an average 45 kg of used packaging per person per year, a recycling rate of over 50%;
- including newspapers and magazines, intensive selective collection accounted for 75 kg per person per year, a diversion rate of 18% of total household waste;
- average cost to the consumer was then A\$10 per year (though additional legislative requirements and changes in how recycling rates are calculated will probably double this);
- FOST Plus revenues were 93% from Green Dot fees and 7% from sale of materials. By 2000 the proportions were expected to be 87% and 13%, but in fact by September 1997, largely due to the fall in waste paper prices, income from the sale of materials had dropped to only 1% of revenues.

More encouraging was that the quantities collected were increasing steadily. Public enthusiasm did not wane after the first few months. Also, kerbside collection had not adversely affected collections in ‘bring’ systems. The public continued to make use of ‘bring’ containers after a kerbside scheme was introduced.

The arrangements for awarding contracts and paying for collection/sorting are separate from those for reprocessing in the FOST Plus system. Reprocessing organisations guarantee that materials will be taken back and recycled. It is these organisations which are responsible for awarding reprocessing contracts. They work on the principle that materials collected and/or sorted will be fairly allocated between individual reprocessors at competitive prices on the basis of free competition.

Using the example of paper/board, the procedure for selecting a reprocessor is that a call for tenders for taking back waste paper from source-separated collections is sent out by the reprocessing organisation mentioning the local authority area, estimated tonnage of paper/board each year, and the population size. The contract is concluded for one year and is renewable. It includes a formula to adjust the price quoted each month to market price fluctuations. The market prices for mixed waste paper in France, Germany and The Netherlands are averaged. The price quoted by the reprocessor will be adjusted each month so that it remains the same percentage above or below the average market price.

In the case of FILGLAS, the glass reprocessors’ organisation, the contract is for five years with an annual price revision. STALUPACK (metals) contracts are for one year, with the price adjustable monthly if the market price moves up or down by at least 10%. With BEVAPLAST

(plastics) and BEPET (PET bottles), there are renewable two-year contracts with a monthly price revision linked to virgin prices. With EMC (beverage cartons) there are fixed-price one-year contracts.

Any revenue from the sale of materials goes to FOST Plus, except for paper/board, which is divided between the *intercommunale* (75% because of the non-packaging paper) and FOST Plus (25%). FOST Plus is also funding the development of new technologies.

France

The fees per tonne of material collected paid to local governments by Eco-Emballages, the Green Dot organisation, relate to the collection service. They are not, therefore, related to changes in the market price of the secondary material, though the more local governments collect per capita per annum, the higher the payment per tonne they receive. This is intended to encourage better productivity, and to recognise that higher yields mean better sorting, which will be more expensive.

However, the waste paper reprocessors who buy the material from the local governments have been operating a price support system for some years through their organisation, Revipac. Revipac is the only recovery organisation for paper and board in France, and all the French paper mills are members. Membership consists of recyclers reprocessing used paper and board packaging, converters and raw material producers.

Revipac gives Eco-Emballages a take-back guarantee for material meeting specification. There is no limit to the quantity of material accepted, and Revipac undertakes to recover from anywhere in France, irrespective of transport distance to the nearest paper mill. Used packaging from households must be baled separately and marked. Local authorities, which have a monopoly on collecting from households in France, have the option of taking advantage of the take-back guarantee or selling the material on the open market. About 80% have opted for the guarantee. If they choose the guarantee, Revipac nominates a recycler. Because there was no market price for waste paper collected from households, it was decided that recyclers would pay 90% of the average market price for grade A2 in France, Germany and the United Kingdom. A2 is currently worth A\$6.10 per tonne, so recyclers are paying A\$5.49.

Revipac, Eco-Emballages and the Association of French Mayors agreed an intervention fund system for material collected from households. As the market price has been positive, the local governments receive 50% of the average A2 market price from the recycler and the remaining 40% goes to the fund. If the price goes below zero, recyclers receive 110% from the fund (i.e. if the price is A\$12 per tonne, they would receive A\$13.20) and the local governments receive no payment from the recyclers.

As waste paper prices have been positive since the fund was launched, there should by now be considerable funds available. However, Revipac points out that although prices were high when the arrangement started, tonnages collected were low. Subsequently, tonnages have increased

and the price has dropped. Revipac stresses that the fund would be used up very quickly if prices did drop, given the tonnages now being collected.

In a recent review, consideration had been given to increasing the proportion of the price paid to local governments, but it has been decided to maintain it at 50%. This is because waste paper prices are currently falling and may go below zero.

Netherlands

The Dutch Covenant for Paper has been agreed and gazetted, and so is now binding on industry. It applies to all cellulose-based products placed on the Dutch market, and all types of paper and board, irrespective of whether they are made from virgin fibres or from recycled material. (There is no special deal for products with a high recycled content).

Local authorities will offer all the waste paper and board separately collected from private households, to a waste paper merchant affiliated to Stichting Papier Recycling Nederland (SPRN). They can choose which merchant to use, and can freely negotiate the price and terms of trade with that merchant. SPRN in turn guarantees to accept all the waste paper and board offered that meets the quality requirements laid down. SPRN will ensure that local governments signing an agreement with it will bear no financial responsibility for any 'chain deficit', i.e. when the international market prices for waste paper and board do not cover transport and reprocessing costs.

Parties placing paper products on the market (the final converter of the packaging material, and the newspaper and magazine publishers) pay into a 'disposal fund' managed by SPRN which is designed to cover the cost of collection for when the price of waste paper is insufficient to pay collection costs. The levy is formulated according to the tonnage of paper each company places on the market, using a (confidential) formula based on the market price for mixed waste paper and for fine papers. The formula uses the international market price, a weighted average of Dutch prices (60%), German prices (30%) and prices in the Far East (10%). It has been agreed by all industry players i.e. converters, publishers, waste paper merchants and packers/fillers.

When the Fund Board decides that there is a 'chain deficit', payments from the fund will be made to local governments to enable them to compensate the merchants for such deficits. The Covenant says that for this purpose, SPRN will set up contracts of a minimum duration of 5 years with local governments. Local authorities can only join this system at times when the disposal fund is not operational or is in surplus.

Negotiations are now under way with the local governments to agree a contract regulating how the fund would pay out. (The local governments stopped negotiations in March to take legal advice and formulate their position; the industry side hopes that negotiations will resume soon.)

No price support fund is needed for glass, the other material local governments are obliged to collect, because local governments only pay the costs of collecting used glass from households and emptying the contents of the Bottle Bank into the collection vehicle.

The Metal Recycling Federation undertakes to ensure that local governments are freed from any responsibility for any 'chain deficit', but in this case that is very unlikely to happen and Covenant II is silent on any price support mechanism.

The view was that since the market price for glass and metals is nearly always above zero, there is no need for a mechanism for funding the 'chain deficit'. In any case, the guarantee that recyclers will take material collected and sorted by local governments applies only to materials meeting an agreed material specification.

Plastics recycling is economically more precarious, but the plastics industry has given no blanket guarantees. Local authorities are not obliged to collect plastics and the implication is that they will only do so when bilateral negotiations have been concluded which assure them of a financially acceptable outlet.

Under the Packaging Covenant, the entire packaging chain undertook to fund the development of plastics recycling. No monies have yet been collected for this, and work is still under way on developing suitable R&D and other projects.

A1.4 THE OTHER COVENANT – THE DUTCH SYSTEM

History

The first Dutch Covenant, concluded in 1991, committed signatories (mostly major companies) to:

- eliminate the disposal of packaging waste through landfill or incineration without energy recovery by 2000;
- reduce the weight of packaging placed on the market in 2000 to below that placed on the market in 1986;
- avoid over-packaging, try to eliminate multi-packs and materials and material combinations difficult to recycle, reduce the range of polymers used, reduce heavy metals and solvent usage; and
- substitute reusable for one-trip packaging wherever environmentally beneficial and economically feasible.

At least 40% of used packaging was to be recycled by 1996 (in fact 46% was recycled in 1994). There were also material-specific collection and recycling targets, but no funding commitments.

The Netherlands was obliged to revise this arrangement to bring Dutch law in line with the requirements of the EC Directive on Packaging and Packaging Waste. The Dutch approach follows the provisions of the Directive while leaving open the option of using new Covenants to achieve targets more in line with Dutch policy. The legislators intended that compliance through

a Covenant should be a more attractive option than compliance via the Regulations. This time the Covenant was negotiated on behalf of the whole of Dutch industry.

The new Dutch Packaging Regulations specify recovery and recycling targets at the upper level provided for in the European Directive: 65% recovery and 45% recycling, with no material recycled at less than 15%. These rates must be achieved by August 1998 - not July 2001 as in the Directive. (The 1996 recycling rate was 51% across all materials and in both household and commercial/industrial waste streams.)

Local authorities will carry out and fund the separate collection of used packaging from households. From August 1998 this will be mandatory for glass and paper and board packaging, but not for the lightweight materials. 'Producers and importers may reach agreement with the local governments on how the other packaging materials will be separately collected', depending on local conditions. The Regulations impose no duties on local governments to seek such agreements. Industry's financial responsibility starts 'from a place to be determined by the municipality' (i.e. industry pays for transport from the bottle bank). End-users of commercial/industrial packaging will be responsible for the costs associated with disposal.

Companies not signing Packaging Covenant II must meet specific obligations. The legal obligation to meet the targets and to 'take measures relating to quantitative and qualitative prevention' will fall on packer/fillers and importers. However, everyone in the packaging chain must 'take every measure that can reasonably be required of them to enable the packer/filler or importer to fulfil these obligations'. For instance, the packaging chain must guarantee to take back all collected and sorted used packaging; raw material suppliers must ensure that sufficient reprocessing capacity is available to achieve the targets and must share equally in the costs of meeting the obligations. Converters are responsible for point-of-sale packaging.

Packer/fillers and importers were selected as the 'standard addressees' because this link in the chain usually decides which form of packaging is used and can influence other links in the chain. In practice, every part of the packaging chain is to some degree a packer/filler or importer, as even the producers of raw materials, semi-finished products, packaging materials and packer/fillers in general supply the goods they place on the market in packaging as well.

Packer/fillers and importers must report on the measures taken, the contribution made to them by other parts of the packaging chain and the results of their prevention measures.

The Regulations transpose provisions of the Directive, i.e. the heavy metals limits and 'essential requirements' of packaging composition and design which must be complied with. These provisions apply to Covenant signatories and non-signatories alike.

The most attractive option for packer/fillers and importers, on efficiency, administrative and financial grounds, is to collaborate within the framework of a Covenant. Another advantage of the Covenant approach is that 'the percentages of material recycling of the various substreams can be offset against each other. If a material recycling rate of 65% can be achieved jointly for all packaging materials, no complicated and expensive financing systems need be set up for compensating local governments.'

However, the Ministry warns that the Covenant approach places considerable demands on industry's self-regulating capability, and if it does not work effectively the Environmental Management Act gives the Government powers to impose mandatory deposits, retailer take-back or eco-taxes.

All individual obligations lapse for businesses which are party to a Covenant. These companies will contribute to achieving the targets agreed but will not be held individually responsible for meeting the targets, notifying the measures taken, reporting on these and monitoring the final results.

The Provisions of Covenant II

Covenant II consists of one umbrella Covenant supported by individual agreements for the various materials and for different parts of the packaging chain. The main provisions are as follows:

- an overall material recycling target of 65% by 2001. This is higher than in the Directive and the Dutch Regulations. The Netherlands have already exceeded the maximum recycling target in the Directive (45%) and are confident that there will be sufficient recycling capacity within the country to recycle at this level.
- material specific recycling targets. These relate to the Dutch 1995 recycling rates in table A.3:

Table A.3: Dutch 1995 Recycling Rates

MATERIAL	1995	2001
Glass	74%	90%
Paper/board	62%	85%
Metals	56% steel 11% aluminium	80%
Plastics	11%	27% (+ 9% chemical recycling)
Wood	-	15%

- no separate energy recovery target, although the Regulations set one. Dutch industry opted to focus on recycling rather than on energy recovery. Negotiators took the view that recycling was more cost-effective, provided that enough time was allowed to reach the targets and provided they are based on market forces to avoid distortions. Also behind this position is the fact that local governments pay the full cost of collecting and sorting packaging waste, with industry bearing the cost only of recycling. In contrast industry would have to pay for incineration.
- a packaging reduction target of 10% by 2001 against 1986 levels. The previous Covenant contained a similar reduction target, but this time Covenant II will allow for the target to be revised in line with economic growth, and in line with increased use of secondary raw materials.

- a measure of protection for refillable beer, soft drinks and mineral waters containers (see below).

Different parts of the packaging chain signed different sub-covenants.

The sub-covenant signed by packers/fillers and importers (and retailers) focuses principally on achieving the packaging reduction target:

- Signatories must implement within their business operations a systematic approach to the environmental improvement of the packaging they use, e.g. the official SVM Prevention Guidelines or companies' own method, e.g. based on ISO 14 001 or the EC Environmental Management and Auditing System (EMAS).
- Signatories must make an annual environmental impact assessment of a number of their packaging items, and investigate and introduce possible improvements. During the life of Packaging Covenant II (which expires at the end of 2002), most of the packaging types used should be assessed in this way.
- The functional demands of the packaging system used must be set against aspects relevant to environmental impact, so as to assess minimum use of packaging material, the possibility of recycling the packaging after use, the use of secondary materials in the packaging and minimum use of heavy metals.
- Importers must instruct their foreign suppliers on the systematic approach to prevention required.
- Signatories with more than four employees and placing more than 50 tonnes of packaging material on the Dutch market must report annually on the prevention measures taken. The Prevention Guideline contains a model for reporting.
- Any beverage manufacturer or importer wishing to introduce a new, non-refillable pack to replace an existing refillable container. Alternatively, those wishing to introduce another new non-refillable pack, as a result of which existing refillable systems may be impaired, must report this plan to the Commodity Board for Beer (PB), to the Commodity Board for Soft Drinks and Waters (BFW), or to the Central Bureau for the Provision Trade (CBL).
- If the manufacturer or importer already places products in refillables on the market, it is mandatory to carry out an environmental analysis if the producer's share of refillables in the relevant product category falls by at least 2%. If the manufacturer or importer does not currently use refillables, the PB, BFW or CBL will advise the company whether the expected impact on existing refillable systems is sufficient for an environmental analysis to be needed.

Under the sub-covenant on paper fibre, it is agreed that:

- Local authorities will improve and intensify their collection systems so that by 2001 at least 85% of waste paper and board, including paper and board packaging from private households, is collected separately.
- Local authorities will offer all the waste paper and board separately collected from private households, to a waste paper merchant affiliated to Stichting Papier Recycling Nederland (SPRN). They can choose which merchant to use, and can freely negotiate the price and terms of trade with him. SPRN in turn guarantees to accept all the waste paper and board offered that meets the quality requirements laid down.
- SPRN will ensure that local governments signing an agreement with it will bear no financial responsibility for any 'chain deficit', i.e. when the international market prices for waste paper and board do not cover transport and reprocessing costs. SPRN will set up a 'disposal fund', fed by a levy on the final convertor of the packaging material. When the Fund Board decides that there is a 'chain deficit', payments from the fund will be made to local governments to enable them to compensate the merchants for such deficits. For this purpose, SPRN will set up contracts of a minimum duration of 5 years with local governments – local governments can only join this system at times when the disposal fund is not operational or is in surplus.
- Local authorities will however bear any costs incurred by the merchants in dealing with 'non-inherent product contamination' (e.g. paper clips and other non-paper materials, contaminated paper and non-reusable paper such as sanitary paper, wallpaper, carbon copy paper and photographs).
- Through statutory instruments and environmental permits, the Environment Ministry and SPRN will ensure that companies in the commercial and industrial sectors keep their waste paper and board separate from other waste and offer it separately. The disposal fund does not apply to commercial and industrial packaging.
- SPRN will ensure that by 2001, at least 85% of the collectable waste paper and board offered it is recycled (subject to its meeting quality standards). It will also ensure that by 2001 at least 85% of the total weight of paper and board packaging placed on the market will be recycled as a material, provided the organisation is offered sufficient quantity of material meeting specification. (Dutch estimates of the 1995 waste paper collection and recycling rate range from 52% to 62%. 62% of waste paper and board packaging was collected, mostly from commercial and industrial sources.)
- If there are no sales outlets for the collected material, the industry will stockpile the surplus if at all possible. Only as a last resort will it be incinerated. Disposal of surpluses will not be financed from the disposal fund.

Under the sub-covenant on the material recycling of glass packaging, it is agreed that:

- Local authorities will improve and intensify their collection systems so that by 2001 at least 90% of packaging glass from private households, is collected separately (through 'bring' systems).
- Local authorities will offer all the packaging glass separately collected from private households, to a company which is a member of the Glass Recovery Association (SKG). They can choose which glass collector or reprocessor to use, and can freely negotiate the price and terms of trade with him. The industry guarantees to accept all the packaging glass offered by local governments contracting with SKG members, provided it meets the quality requirements laid down.
- In principle local governments only pay the costs of collecting used glass from households and emptying the contents of the Bottle Bank into the collection vehicle. However local governments will also bear any costs incurred by the merchants in separating and disposing of 'non-inherent product contamination' (e.g. non-glass material, non-packaging glass and hazardous and small-scale chemical waste such as glass with residues from nail polish, photo chemicals or medicines).
- Through statutory instruments and environmental permits, the Environment Ministry and SKG will ensure that companies in the commercial and industrial sectors keep their packaging glass separate from other waste and offer it separately. The take-back guarantee does not apply to commercial and industrial packaging.
- SKG will ensure that by 2001, at least 90% of the total weight of glass packaging placed on the market will be recycled as a material, provided the organisation is offered sufficient quantity of material meeting specification. (Dutch estimates of the 1995 glass recycling rate range between 74% and 81%. Only 15% of local governments had achieved the target collection level of 25 kg per inhabitant, and only 20% of glass from the catering sector was collected for recycling).
- The 50% colour separation target in the 1991 Covenant will remain (in 1995, 53% of collected glass was separated by colour).

Under the sub-covenant on the material recycling of metal packaging, it is agreed that:

- The Environment Ministry and the Steel Recovery Association (SKB) will ensure that companies in the commercial and industrial sectors keep their metal packaging separate from other waste and offer it separately where applicable.
- The Environment Ministry will use all reasonable efforts to create the conditions to promote the creation of an infrastructure for the separation of metal packaging – preferably prior to incineration – from the totality of collected household waste.

- The Metal Recycling Federation (MRF) guarantees to accept all metal of packaging origin that is supplied separately, provided it meets the quality requirements and minimum consignment size laid down.
- The MRF will ensure that local governments are freed from any financial responsibility arising from any 'chain deficit' occurring in respect of metal packaging from households that meets the specified quality requirements, and has been collected by a local authority and supplied to a waste processing plant that has an agreement with an MRF member.
- The MRF undertakes to recycle as a material, at least 80% of the total weight of metal packaging placed on the market in the Netherlands, provided this is supplied to it separately and meets the quality requirements laid down. (In 1995 the recycling rate for metal packaging was 53%; 48% of metal packaging waste in the commercial sector and 82% in the industrial sector was collected separately).

Under the sub-covenant on the material recycling of plastics packaging, it is agreed that:

- The Association for Plastics Packaging and the Environment (VMK) will try to promote the use of secondary raw materials originating from packaging waste in conformity with market conditions.
- The Environment Ministry will ensure that companies in the commercial and industrial sectors separate plastics packaging waste and offer it separately (this will be done by means of information sheets rather than legislation).
- The Environment Ministry will use all reasonable efforts to create the conditions to promote the creation of an infrastructure for the separation of plastics packaging from waste streams that have been integrally collected.
- In order to intensify the separate collection and mechanical recycling of plastics packaging waste from the commercial and industrial sector, VMK will take measures that support and encourage end-users to supply their packaging waste separately to a collector or reprocessor of plastics waste. The aim is that sufficient plastics waste of appropriate quality being supplied so that by 2001, at least 27% of total plastics packaging (by weight) can be mechanically recycled (at present more than 10% is recycled as a material).
- Projects will be carried out to develop the mechanical separation of plastics waste from mixed household waste.
- The reprocessors of plastics packaging waste undertake, under market conditions, to take back and mechanically recycle the plastics waste supplied separately, provided it meets the quality standards laid down.
- VMK will take all reasonable measures to ensure that a further 8% recycling is achieved by 2001, in addition to the 27% previously mentioned. This will be done through a mixture of mechanical and feedstock recycling.

A2 *SYSTEM COSTS AND EFFICIENCIES IN EUROPE AND CANADA*

A2.1 EUROPE

Targets

Table A.4 shows some EU member states recycling rates and targets. However, the operating costs of the various household packaging recovery systems are not strictly comparable.

The EC Directive on Packaging and Packaging Waste allows considerable leeway. Except in Greece, Ireland and Portugal, by July 2001 50%-65% of used packaging must be 'recovered' (recycling/ composting + energy recovery), 25%-45% must be recycled (excluding energy recovery), and no material may be recycled at less than 15%.

Thus the cost of the system represents the cost of reaching whatever targets are set at national level, from whatever recycling rates were the starting-point. Thus European costs include an element of system development costs which are not present in the mature Australian system.

Member states with sufficient capacity available are allowed to set higher targets than the upper levels in the Directive, provided they can satisfy the European Commission that the measures taken do not distort the Internal Market and do not hinder other member states' ability to comply with the Directive.

The plastics recycling rates include substantial quantities of material collected from households and exported for recycling abroad. 'Export recycling' accounted for 31%-50% of total plastics recycling in Belgium, Germany, Ireland and Sweden, and 14%-27% in Denmark, France, Italy and the United Kingdom. Austria and the Netherlands were on 10%, and only Portugal and Spain carried out all their plastics packaging recycling within their own borders. Note that PET beverage containers are refillable in Austria, Denmark, Finland, Germany, the Netherlands and mostly in Belgium, and so contribute much less to the overall critical mass.

The cost and availability of energy-from-waste (EfW) facilities enters into the European equation (table A.5). The EC Directive allows considerable latitude for waste paper and plastics to be collected unsegregated and incinerated, and still contribute towards the 'recovery' target: in particular EfW is a low-cost alternative to plastics recycling.

Table A.4: EU Member States Recycling Rates and Targets

COUNTRY	RECYCLING RATES				RECYCLING TARGETS
	Glass (1996)	Rigid & flexible plastics (1995)	Aluminium cans (1996)	Steel cans (1996)	
Austria	n/a	22%	50%	47%	70% glass, 60% paper/board, 50% metals, 20% plastics from 1996

Belgium	66%	13%	25%	30%	40% for each material in each Region in each waste stream by 1997
Denmark	66%	11%	0	n/a	80% glass, 40% C/I PP, 50% C/I LDPE, 50% C/I EPS, 70% C/I HDPE by 1997
Finland	63%	n/a	80%	n/a	53% paper/board, 48% glass, 25% metals, 15% plastics by 2001
France	50%	9%	14%	44%	Range as in EC Directive
Germany	79%	43%	81%	81%	72% household glass, steel and aluminium, 64% household paper/board and plastics from 1995
Greece	39%	n/a	35%	17%	not set yet
Ireland	46%	2%	20%	n/a	25% recovery by 2001, & 55% glass recycling
Italy	53%	7%	37%	n/a	>25% overall, >15% for each material by 2001
Netherlands	81%	12%	25%	58%	90% glass, 27% plastics, 80% metals, 85% paper/board by 2001
Portugal	43%	1%	17%	n/a	25% recovery
Spain	35%	6%	17%	19%	>25% overall, >15% for each material by 2001
Sweden	72%	9%	91%	54%	90% al & pet bev containers, 70% glass & non-bev metals, 65% corrugated, 40% other paper/board & other plastics, by 2001
UK	22%	7%	31%	16%	>52% overall recovery, >15% recycling for each material by 2001

Sources: industry recycling estimates; Perchards, 'Packaging legislation in Europe' (1998)

Table A.5: EfW Capacity of EU Member States

COUNTRY	1997 EfW CAPACITY AS % OF MSW	1995 COST (A\$ PER TONNE)
Austria	12%	\$170
Belgium	40%	n/a
Denmark	80%	\$150
Finland	4%	\$52
France	38%	\$80
Germany	(35%)	
Greece	0	
Ireland	0	
Italy	14%	\$80

Netherlands	40%	\$152
Portugal	0	
Spain	6%	\$40
Sweden	55%	\$70
UK	4%	\$68

Source: European Energy from Waste Coalition (1998)

However, the recycling targets set by some member states are higher and more specific than the EC's and largely preclude this. Six of the 15 member states have little or no EfW capacity, and in Germany EfW does not count towards the targets set in the Packaging Ordinance (which predates the Directive and has not yet been brought into line with it).

The wide difference in gate fees from country to country cannot all be explained by differences in technical standards and how far the cost of the plants has already been written off. There is a fairly close correlation between EfW costs and landfill costs, which suggests that incinerator operators charge what the market will bear.

Table A.6: Weight-based Costs in EU Member States

MATERIAL	FEE RATES (A\$ PER TONNE)		
	BELGIUM	PORTUGAL	SPAIN
Glass	12.3	2.4	<i>(per unit)</i>
Paper & board	13.1	16.0	39.4
Steel	53.2	28.0	49.3
Aluminium	117.5	112.0	81.1
Rigid plastics	328.3	64.0	187.8
Flexible plastics	541.1	64.0	187.8
Beverage cartons	226.3	120.0	133.2

Costs

European funding systems for consumer packaging charge either by weight (Belgium, Portugal, Spain), per unit (France, Norway), by a combination of the two (Germany) or, as an interim measure pending identification of the 'true costs' attributable to each material, by turnover (Finland, Ireland). Table A.6 shows the current weight-based costs in the countries that calculate their fees in this way.

Impact of Scheme Efficiency on Costs in Each Country

'Scheme efficiency' relates not just to the ability of the national compliance organisation(s) to contain costs, but also to the legislative underpinning which may well impose heavy costs (table A.7). For example, the German requirement to establish a nationwide collection system within 18 months and to work with contractors nominated by the local authority, versus Belgium's longer period of notice (but still tough targets) and willingness to allow competitive tendering.

Table A.7: Scheme Efficiency

COUNTRY	HOUSEHOLD PACKAGING SYSTEM	COSTS (A\$M)	POPULATION COVERED (M)	PER CAPITA COST (A\$)	RECYCLED (000 TONNES)	RECYCLING COST (A\$ PER TONNE)
Germany	DSD (1997)	3 420	82	41.50	5 322	643
Belgium	FOST + (1997)	50	5	10.00	289	173
France	E-E (1996)	104	12	8.65	581	179
Spain	Ecoembes (2001 est.)	575	39	14.75	n/a	n/a
Sweden	REPA (1997)	95	9	10.50	n/a	n/a

This suggests the following:

- Belgium (FOST Plus) has the most efficient system, but per capita costs are likely to rise by 40% as the very tough targets bite even harder. Costs should be stable after 1999 unless the EC imposes higher targets (very unlikely).
- Sweden (REPA) is almost as efficient as Belgium, and is already meeting its 2001 targets for rigid packaging and probably also for paper/board, but still has some way to go on plastics – from 9% in 1995 to 40%. There is no cross-subsidy, so fees can be expected to remain stable for all other materials but to rise by (say) 40% for plastics.
- France (E-E) positioned itself as a high efficiency achiever with its gradualist approach, giving maximum time to learn from experience, but E-E is now lagging behind target and is likely to come under pressure from the new (Green Party) Environment Minister to accelerate. E-E could end up throwing a lot of money at the problem to meet its objectives. However on balance not much change to French costs is expected – probably a small increase.
- Spain (Ecoembes) is only just getting under way, and Italy has not really started yet (except for beverage containers).
- Germany (DSD) has notorious efficiency problems, but its costs have already peaked. The targets have been met, and will not be increased unless the EC increases them, which is highly unlikely. Recent renegotiation of DSD's waste management contracts promises lower costs in the next year or two (a per capita reduction to A\$34.50). DSD claims that the forthcoming amendment to the Ordinance will help it combat free riders and this will reduce costs by a further A\$6.50 per head.

Costs in countries not shown in table A.7:

- Austria's (ARA) costs are of the same order of magnitude as Germany's, but there are no identifiable big cost savings on the way.

- The PRN system has created a total lack of transparency in the UK. It is not easy to identify system costs or achievements. The cost to packer/fillers may rise by 5 times between now and 2001; maybe by 10 times if the Government takes drastic action to ensure that there is no shortfall against the targets (which otherwise looks inevitable).
- Costs in the Netherlands are likely to be similar to Belgium, but this is impossible to determine as costs are internalised. Its recycling rates are where Belgium expects to be in a couple of years, so costs are probably already at their maximum.

System Efficiencies: The Lessons from Germany

The Germans, as the pioneers of a new style funding system, inevitably made a number of mistakes in their scheme. Other similar systems which followed have considered the German experience and have tried to avoid these mistakes. Considering where Germany went wrong makes it easier to understand how other European systems have developed as they have, and also serves as a cautionary tale.

The German Packaging Ordinance required, in principle, in-store take back of used packaging from consumers. Industry felt that an industry operated, close-to-home collection system would recover used packaging more efficiently and more cost effectively than in-store take back. They proposed the DSD (Duales System Deutschland) system, which was included in the law as an exemption from take back by retailers. The system was to run in parallel with local authority collections for other waste (hence 'dual'). Collection and sorting would be funded by packers/fillers, who would license the use of the Green Dot logo (a registered trade mark) to show the public that they were participating in DSD and to indicate which packs should go in DSD's special yellow collection containers.

The intention was that the licence fees paid by packers/fillers would be passed on to retailers and thus to final consumers in the product price. For their part, the producers of packaging raw materials and the packaging converters guaranteed to take back all materials collected by the DSD and ensure it was recycled.

The German Packaging Ordinance gave the DSD very little time to organise itself and also required that local governments approved the collection arrangements DSD made in their area. Finally, DSD had to operate throughout each Federal State to gain approval, so leaving out low population rural areas was not an option, even if the collection targets could be met without collecting everywhere. This meant that the DSD had to negotiate many contracts in a short period of time from a weak bargaining position and was forced into unfavourable terms.

Further, it was agreed that recyclers would guarantee to take back all materials collected and sorted through the DSD and recycle them. All materials would be free, even those with a positive market value. The materials were made available free in recognition that recyclers would have to invest in new reprocessing capacity.

Problems quickly emerged. The quantities of material collected vastly exceeded projections, but they were of poor quality and contained many non-packaging items. This was partly because

whereas waste collection charges in Germany are notoriously high, use of the DSD system was 'free' (the costs having been paid in higher product prices on consumer goods). This created a clear incentive for householders to put non-packaging items, such as telephone directories and plastic toys, in the DSD receptacle.

Such mis-sorting was not only the result of high waste charges however. Environmental awareness is very high in Germany, and disproportionately focused on waste issues. It was a commonly held belief that Germany had a 'landfill crisis' and that the packaging ordinance would go a long way to relieving this. Many Germans placed what they saw as recyclable items in the DSD container in the hope that they would also be recycled.

The situation was exacerbated by the collection and sorting contracts negotiated by DSD with local governments or private waste contractors. These contractors were paid according to the weight of sacks delivered to MRFs, i.e. including the weight of the contaminants. After the materials had been sorted, the DSD had to pay to dispose of non-packaging items at commercial waste rates. A high level of contamination meant that contractors were paid more, and local authority contractors in addition were saved landfill charges. Thus, the contractors had no incentive to encourage consumers to sort more accurately.

Further, the guarantee by recyclers to take back material from MRFs was not connected to a quality specification. This meant that sorters were paid even if the materials were poorly sorted.

The recyclers did not necessarily spend their windfall from free materials on increasing recycling capacity. At the time, it was thought that industry would all pull together in the face of a hostile government. This was certainly the case for the retailers who had most to lose if the DSD failed. They in turn put pressure on packers/fillers, refusing to take products not licensed for the green dot, and asking for packs to be minimised and made of easily recyclable materials. However, for the converters, protecting their bottom line was probably more important than an indirect risk. The problems were greatest for plastics, where the greatest investment was needed, because plastics recyclers are usually outside the packaging chain and had nothing to fear whatsoever. The plastics recycling guarantor organisation failed and its activities were taken over by DSD. DSD's fees for plastics now cover not only collection and sorting but also recycling.

The DSD had now corrected most of the errors within its control. Others require a change in the law. An amendment to the ordinance has been under discussion for several years, but has so far failed to get through the Bundesrat, the upper chamber in the parliament which represents the federal states.

Lessons learned from Germany and changes made in other member states in response to the German experience include:

- local authority or private contractors are now paid for each tonne of material made available (i.e. on output, not input), but only if it meets an agreed quality specification. This creates an incentive for contractors to do their job properly, avoiding materials being wasted because they are considered unusable by recyclers or having to resort them.

- recyclers pay for materials at market prices, or at an agreed minimum price. A range of different arrangements is in place. Some member states have created structures to cope with fluctuating prices or prices which may be below zero (discussed below). The revenue may go to the local authority or to the recovery system.
- the financial contribution made by recovery organisations to recycling should be strictly controlled. It is negotiated with organisations representing each material. Assistance is usually in the form of support for agreed R&D projects or new infrastructure.
- accepting a wider range of recovery options for packaging than material recycling, particularly energy recovery (*not an option in some Australian jurisdictions*). German insistence on very high material recycling rates has proved very expensive, particularly for plastics.
- concentrating activities on the most cost-effective way of maximising recovery. This means focusing collection in areas with an appropriate socio-demographic profile and in areas of high population density. It also means concentrating on specific materials, for example collecting plastic bottles from households, but not films.
- anticipating how businesses would respond. It was widely assumed in Germany that all businesses would do their bit to ensure the targets were met. The DSD underestimated the number of free riders. Its only recourse is to pursue offenders in the courts, an expensive option. Other countries were more realistic in realising that businesses would look after themselves first. In France, for example, the feared trading standards officers enforce non-compliance with the legislation and penalties include imprisonment of directors.
- The need for competition in the system. The requirement that the DSD operates everywhere in each state effectively ruled out competition and the need to obtain local authority approval and the short time allowed for it to establish made it difficult to select contractors on the basis of competitive tenders. Other countries have injected competition in their systems to ensure costs are minimised.
- Some have allowed more than one recovery system to operate. This may not generate real competition – the prices charged for household packaging waste in France by Eco-Emballages and its competitor Adelphe are identical, and the prices charged for transport packaging in Austria by ARA and its new competitors are remarkably similar. The existence of more than one system also complicates the organisation of communications campaigns.
- Competition within the system may be a more effective way to ensure costs to industry are minimised. For example, in Belgium, where FOST Plus is the only approved system, contracts for collection, sorting and recycling are awarded on the basis of competitive tender.
- Anticipating how the public would respond and the importance of public education campaigns. The DSD initially said that the green dot on a pack meant the pack would be recycled, which created unrealistic expectations among the public and opened the DSD to

attack from environmentalists. It also created an association between the yellow sacks and recyclables, encouraging the public to put non-packaging recyclables in DSD containers. Other systems have communicated the admittedly more complex message that the green dot means that the producer has made a financial contribution towards the development of recycling systems. Recovery systems devote considerable resources to communications, both to encourage a high participation rate and to ensure that consumers sort accurately.

The Administrative Costs of the Green Dot Organisations

The Green Dot organisations take over the legal obligations of their members for meeting the recycling targets laid down. They handle large sums of money and control the use of the green dot trademark. They have therefore developed a formidable administrative machinery, as table A.8 shows.

Processing members' licence fee payments is unlikely to be population dependent, since there are roughly the same number of medium-sized or large brand owners in each Western European country. On the other hand, the staff needed to handle relations with local governments depends on how many authorities they have to deal with (this is not necessarily a function of population, since local governments may be of very different sizes – and may be grouped together for waste management purposes). How many staff are needed to handle communications depends on how much the organisation needs to do at local level.

DSD has to manage the Green Dot trademark, of which it is the ultimate owner. It also has to deal with powerful regional governments as well as federal and local government. It needs a vigorous communications program to counter its opponents at home (the Greens and others who believe that Germany needs less packaging, not more recycling) and abroad. It has opted for a very precise system of measuring members' financial obligations. Nevertheless, it is difficult to see why DSD needs as many staff as it has.

Table A.8: Administrative Costs

ORGANISATION (COUNTRY)	POP'N (MILLION)	STAFF NUMBERS (1996)	ADMIN COSTS (A\$M) (1996)	TURNOVER (A\$M) (1996)	STAFF PER MILLION POP'N	TURNOVER (A\$M) PER STAFF MEMBER
DSD (Germany)	82	343	Operating: 106 Staff: 25	3306	4.2	9.6
Eco-Emballages (France)	58	60	Operating: 16 Staff: n/a	139	1.0	2.3
FOST+ (Belgium)	10	44	Operating: n/a Staff: 3	62	4.4	1.4
ARA (Austria)	8	43	Operating: 16 Staff: n/a	297	5.4	6.9

Note: The operating and staff costs are taken from the 1996 annual reports of each organisation and may not be strictly comparable. For instance, how far they outsource to consultants varies from one organisation to another.

Outside Germany, the general pattern has been for new organisations to move quickly to a staffing level of 20 or so, and then to expand to a little more than double that as the system reaches full speed. The same thing is happening with the new Green Dot organisations in Spain and Portugal and the non-Green Dot organisations in Scandinavia (aggregating the central fund

collecting organisation and the material specific disbursers of the funds) and the United Kingdom. The one exception is Ireland, where the plan was that companies would internalise costs as far as possible – but REPAK is struggling to cope with a staff of two, and does not have the financial and human resources to meet the demands placed on it.

Waste Paper Collection and Utilisation Rates

Paper and board recycling is complicated by each member state's balance between imports and exports of the various grades. A net importer of packaging grades may achieve a very high utilisation rate (the proportion of new product made from recycled material) but a much lower recycling rate. The utilisation rates and collection/sorting rates for paper and board products (*NB not just packaging*) in Western Europe in 1996 are shown in table A.9.

The explanation for utilisation rates above 100% is that significant quantities of fibres (up to 40%) are lost during the recycling process. As table 4.7 shows, utilisation rates have substantially improved over the last five years. However within each national market, utilisation is dependent on productive capacity. Portugal is the only Western European country to record a decline in waste paper utilisation (measured in tonnage) between 1991 and 1996. This is probably due to closure of a paper mill.

Once utilisation rates approach 100%, the recycling rate can be increased in only two ways:

1. *Build a new mill.* This is expensive and has a long lead-time. Unlike plastics recycling, paper mills are large-scale production units which demand assurance that there will be a large and permanent increase in domestic demand (if only through import substitution or creation of a new export market); or
2. *Export the surplus collected waste material.* But other member states are playing the same game. Exports to the Far East come into competition with surplus American waste paper, and increasingly with surpluses from Asian countries which are introducing their own recycling mandates.

Table A.9: Paper Utilisation, Collection/sorting Rates

COUNTRY	PAPER & BOARD UTILISATION RATE	PAPER & BOARD COLLECTION/SORTING RATE
Austria	42%	71%
Belgium	27%	38%
Denmark	123%	54%
Finland	6%	62%
France	49%	41%
Germany	60%	71%
Greece	87%	33%
Ireland	127%	12%
Italy	50%	31%
Netherlands	71%	65%

Norway	11%	50%
Portugal	31%	39%
Spain	74%	41%
Sweden	17%	66%
Switzerland	65%	67%
UK	70%	40%

Source: CEPI

There may be limits on the achievable *recycling* rates, but *recovery* rates are much more flexible – at least, in those member states which have significant energy-from-waste capacity (Belgium, Denmark, France, Luxembourg, Netherlands and Sweden. Germany also has EfW but this does not count towards meeting the targets.)

The snag is that while incinerating used packaging paper may help meet national recovery targets, it prevents used corrugated board from contributing cheaply and efficiently to any overall recycling target. There are overall (i.e. not material-specific) recycling targets in Belgium, France, Italy, Portugal, and Spain.

Thus in Belgium and France, which have overall targets and EfW, the household packaging materials will probably not be baled out by corrugated board.

The European paper industry achieved an overall collection/sorting rate of 50% in 1996. Five years previously the collection/sorting rate was 39%. Waste paper utilisation has grown over the same period from 23.6 million tonnes to 32.0 million tonnes, an increase of nearly 36%. The overall European utilisation rate for packaging papers in 1996 was 71%.

Table A.10: Waste Paper Utilisation Rates in EU

COUNTRY	1991 WASTE PAPER UTILISATION (‘000 TONNES)	1996 WASTE PAPER UTILISATION (‘000 TONNES)	% INCREASE
Austria	1 184	1 537	30%
Belgium	286	361	26%
Denmark	307	395	29%
Finland	443	575	30%
France	3 367	4 192	25%
Germany	6 110	8 888	45%
Greece	N/A	307	N/A
Ireland	N/A	45	N/Aa
Italy	2 703	3 515	30%
Netherlands	1 896	2 106	11%
Norway	174	240	38%
Portugal	339	315	-7%
Spain	2 222	2 774	25%
Sweden	1 038	1 502	45%
Switzerland	582	948	63%
UK	2 954	4 323	46%

Source: CEPI

Europe is currently self-sufficient in waste paper. However, the situation varies from country to country, and almost 20% of the paper recycled in Europe has to cross a border. The use of waste paper is most attractive for the paper mills in densely populated areas where large supplies can be transported over short distances. Meanwhile, countries with rich forestry resources provide the high quality virgin fibres needed to maintain these high recycling rates without loss of performance.

A2.2 CANADA

At the time the OMMRI Blue Box system got under way in Ontario at the end of the 1980s, landfilling Toronto's waste (300,000 tonnes of waste per annum) was costing A\$53 per tonne, and municipal waste collection A\$26-A\$52 per tonne.

The program quickly proved popular with householders, but by 1992 it was being heavily criticised by some commentators as economically unsustainable. The cost of collecting Blue Box material was estimated as A\$210-A\$315 per tonne, the net cost after sales of the material being A\$204 per tonne. If garbage collection and disposal was costing up to A\$105 per tonne, this meant a net on-cost of at least A\$100 per tonne. One critic (Terence Corcoran of *The Globe and Mail*) suggested that 'if each household had to pay a flat monthly fee of [A\$16] for basic garbage pickup and an extra [A\$1 or A\$2] for each extra bag of garbage and Blue Box collection, the price system and the market system would at least have a chance of operating.'

The demise of the Blue Box system has continually been predicted by its opponents, and the size – and very existence – of the 'funding gap' in Ontario has been hotly contested. However the numbers now look rather healthier than those cited several years ago, when it first became clear that only aluminium cans could be collected and recycled at a profit:

- Early in 1998 Toronto Councillor Judy Sgro claimed, on the basis of a leaked city document, that the Blue Box system costs a net A\$143 per tonne recycled, compared with a landfill cost of A\$102 per tonne – a deficit of A\$41 per tonne;
- This, she says, is very different from the information she was officially given by Toronto Metro staff at the end of 1997, which was A\$55 per tonne for recycling and A\$63 for landfilling – a saving of A\$8 per tonne;
- Corporations Supporting Recycling (CSR – the successor to OMMRI) challenged this, stating that the cost of recycling in Toronto ranges from A\$58-A\$62 per tonne, versus landfill costs of A\$93 per tonne – a saving of more than A\$30 per tonne;
- City of Toronto Works Department issued a press release confirming the CSR figures, and explaining that the leaked document was comparing historical waste management costs with current costs.

More than 80% of beer in Ontario is sold in refillable bottles and so is not a participant in the Blue Box system. There is however a 10¢ tax on beer cans which raises A\$39 million each year, a sum almost equal to the annual net cost of the province's Blue Box systems (A\$42 million).

By contrast, an internal report by the Ontario Government has shown that a CDL on carbonated soft drinks would cost A\$250 million 'for even the most efficient system'.

A recent study by RIS found that Canada and Germany are both diverting about 15% of their solid waste – in Germany, at a cost of A\$845 per tonne, and in Canada, at a cost of A\$63-A\$84 per tonne.

