

**ENVIRONMENTAL ISSUES
RECOVERED PAPER FIBRE COLLECTION SYSTEMS**

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

The present report on Environmental Issues: Recovered Paper Fibre Collection Systems was prepared in 1995/96 by the Ad Hoc Working Party on Pulp and Paper of the OECD Industry Committee. It is made available to the public on the responsibility of the Secretary-General of the OECD.

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PREFACE

This report was prepared during the years 1995-96 by the Ad Hoc Working Party on Pulp and Paper of the OECD Industry Committee in response to a range of issues related to the collection of recovered paper and to the need for a comparative study on the role of paper in recovery and recycling. The information contained in the report was collected from OECD Member countries; it is intended to provide a broad overview of the situation in order to assess the relevance of collection systems and the regulatory climate pertaining to this activity.

The report deals with recovered paper which is defined as used paper or scrap that can be recovered for use as a raw material in the production of a new product, *i.e.* recycled. Waste paper which is recovered in an environmentally sound manner ceases to be waste as the recovery operation produces a material of beneficial use. Recovered paper is distinguished from waste paper which is not re-usable or recovered and which may need to be disposed of in some manner. Examples of non-recovered paper include tissue, legal documents, building papers and decorating products (for details see the Working Party's report entitled "Environmental Issues: Waste Paper", 1992). Examples of classifications of recovered paper are given in Annexes I and II. For a definition of other terminology used in this report refer to the Glossary.

Viable collection systems for recovered paper fibre make a positive contribution to the environment through reduced volumes of solid waste being deposited to landfill while obtaining the optimum use of recovered fibre.

SUMMARY AND RECOMMENDATIONS

In general terms, the collection of recovered paper and paperboard is now well recognised and constitutes a valuable source of fibre for paper and board manufacturers. From the use of old corrugated containers in the production of packaging, the inclusion of recovered fibre in paper grades from newsprint through to printing and writing papers is now not only an accepted fact but also a necessary part of raw material procurement. Different collection systems are being utilised in countries and are evolving continuously. The trend of increased volumes of recovered fibre being used in paper and paperboard manufacturing is likely to continue given FAO projections of continued strong demand for pulp and paper.

The growing recovery rate of recovered paper as a source of fibre was initially brought about by economic reasons and recently reinforced by the environmental concerns of society. Countries with low natural raw material resources have been especially concerned to establish the use of recovered fibre in the manufacturing process. Today, those countries with a large forest resource base recognise that this fibre is an important addition to the fibre cycle that extends the useful life of fibre.

Old newspapers, magazines and corrugated containers constitute the largest source of recovered fibre for the paper and paperboard industry. Old newspapers (ONP) and old magazines (OMG) are, for the most part, collected through households but publishers and printers as well as charitable and other non-profit organisations are also a source for this recovered fibre material. Household collection is mainly undertaken using curbside or bring systems. In the former, the recovered paper is placed in containers, bags or bundled and deposited on the curb for collection or, in a multi-unit building, in containers inside or outside the building. Collection is carried out by the local government or by private collectors contracted by the public authorities.

The commercial/industrial sectors are the primary source of old corrugated containers. Commercial establishments such as supermarkets, shopping malls, department stores, schools, print shops, etc., are important sources, as are factories and other manufacturing plants in the industrial sector. The used packaging is gathered at the establishment, baled and collected by private recovered paper collectors/merchants or by corrugated and container board manufacturers themselves.

Office papers, including computer printout, and waste from printing shops and stationery stores are amongst the major sources for this higher grade of recovered fibre. This source is now recognised as a large potential supplier of fibre, and collection systems are rapidly being developed. The most extensive collection system in place is the placement of containers in each office or work station and in other locations where recovered paper of this type is generated. Some sorting is done at source but more user education is necessary to realise the full potential of this source. Private waste management companies or paper merchants collect the material for sale to paper manufacturers.

The cost of collecting recovered fibre is affected by a number of factors. When local governments are involved, the cost of collection is paid by the public authorities who recoup some, if not, all the costs through a tax levy on property or waste collection. Collection of municipal-recovered paper and collection from commercial/industrial sites is undertaken by private collectors, paper merchants or by paper manufacturers. Transportation from the point of collection to the manufacturing plant is one of the

most significant costs involved in the cost structure, if not the most significant. Sorting, bundling and other related activities also contribute to the cost structure. Private sector involvement must be profitable and, with the cyclical nature of the pulp and paper industry, pressure on profits can be severe. The elasticity of price with both supply and demand of recovered paper is very high, small imbalances in demand giving rise to huge price changes. This can happen more quickly than, and several times within, the cycles for pulp and paper as a whole.

Sorting, either at source or at an intermediate stage of the collection system is required to obtain optimum quality for the grades of paper made from the recovered paper fibre. Markets and local conditions are a strong determinant of the exact nature of collection programmes. This has proven to be the most economical way to obtain the highest quality recovered fibre.

To encourage collection and recycling, industry and governments in most OECD countries have undertaken public awareness campaigns. These campaigns involve both print and electronic media and encompass public agencies and private enterprises. In the private sector, companies and their industry associations play a large role. National and local levels of government also have an important place in encouraging collection of recovered paper.

The Ad Hoc Working Party recommends that:

- i) Governments should encourage the general public and industry to collect recovered paper fibre. This encouragement should be accompanied by a broad educational programme describing the life cycle process, including both the economic and environmental costs/benefits of recovery of recovered paper.
- ii) Governments should encourage maintaining an efficient, viable system to collect and utilise the available volumes of recovered paper fibre at high and constant rates. Transportation, sorting, baling, storage, equipment and facilities involved in setting up collection systems are key factors to be considered.
- iii) Industry and governments should co-operate in providing information and guidance to households, commercial enterprises and industrial firms on the benefits to be derived from sorting recovered paper at source.
- iv) Governments, in establishing agreements, targets or regulations for recovery of paper, should consider and facilitate options, in addition to recycling, for the disposal of potential excess quantities of recovered paper. Incineration for energy generation, composting and the production of home insulation are examples. There should not be preferential treatment of these options.
- v) Governments, in developing environmental policy and accompanying legislative frameworks, should give, in light of apparent positive results, first consideration to voluntary agreements and undertakings by industry, prior to implementing legislation. Examples of such agreements include the AGRAPA agreement in Germany and the Packaging Protocol in Canada.

- vi) Governments, in establishing environmental regulations, should ensure that the regulations concerning collection and recycling of recovered paper result in a positive overall environmental benefit.
- vi) Industry should be encouraged to continue research and development that will permit increased utilisation of all grades of recovered fibre and to develop the technology required to process this fibre.

I. Introduction

The recycling of recovered paper, not a new phenomenon, has become of significant importance in most OECD countries, although for different reasons. On the one hand, the lack of adequate and suitable fibre resources in some Western European countries was the original driving force to increase recovered paper utilisation rates. In North America, the impetus to recycle arose from the public perception that paper containing recycled fibre is environmentally friendly, and the recognition by industry that used paper can be a viable and economic source of fibre. Concern over the volume of solid waste being directed to landfill sites was also a factor. However, the recent increase in demand for most grades of paper has been instrumental in diverting more and more recovered paper from landfill sites. As a result of these and other factors, many countries have or are about to introduce programmes, legislation and/or regulations to promote waste fibre recycling.

In other countries, different levels of government have established policies and/or incentives to encourage collection or have arranged for collection of recovered paper to be based on voluntary agreements that specify the volumes to be collected. In most cases, the instruments encouraging collection are directed at industry and the producers, with much less being directed towards the public.

Table 1. Recovered paper
Thousand tonnes

Country	1989	1994
Canada	1 652	2 458
Finland	684	472
France	2 877	3 514
Germany	5 663	9 758
Italy	1 752	2 278
Japan	n.a.	14 908
Norway	157	297
Portugal	291	3
Spain	1 591	1 816
Sweden	890	990
Switzerland	n.a.	754
Turkey	n.a.	425
United Kingdom	2 880	4 048
United States	24 664	35 100

Source: OECD.

Recovered paper collection in the OECD countries continues to increase as Table 1 indicates. This, as explained earlier, is a result of the realisation by paper manufacturers, on the one hand, that this is a source of fibre whose potential has not been fully tapped and has not hitherto been efficiently utilised. On the other hand, environmental pressure on governments and industry to improve environmental performance has increased as has the need to use virgin fibre more efficiently. Consumption and collection of recovered paper have increased in a corresponding way. As pointed out in a recent Working Party report (Environmental Issues - Waste Paper, 1992), utilisation varies widely from country to country as a result of the size of the domestic industry that can absorb recovered fibre, the pressures on the various level of governments and the availability of usable recovered fibre.

Table 2. Paper recovery rate
Percentage

Country	1989*	1994**
Canada	21	33
Finland	34	59
France	33	36
Germany	41	59
Italy	27	33
Japan	48	52
Norway	25	39
Portugal	41	36
Spain	37	37
Sweden	48	57
Switzerland	61	58
United Kingdom	30	35
United States	31	40

Source: *OECD; **FAO.

This report examines the collection systems in place in the respondent countries, looking at the systems from the point of view of the recovered product, that is, old newspapers (ONP); old magazines (OMG); old corrugated containers (OCC); white papers (office paper, offcuts from printing firms and allied companies, etc.).

The private sector has been engaged in collecting and using recovered paper for many years. In particular, packaging producers have been utilising, very successfully, OCC as a fibre source in their product. The co-operation between waste management/recovered paper merchants and producers has resulted in a number of viable, efficient collection systems that have also been the basis for the additional collection of other recovered paper grades. As the volume of recovered paper collected has risen, the requirement for sorting has become more urgent to ensure that the recovered material is used most efficiently. This task is the responsibility of the private sector. In addition, producers have a responsibility to ensure that residues from the use of recycled fibre are disposed of in a manner that does not harm the environment.

II. Recovery Systems by Main Paper Types

1. Old Newspapers (ONP)/Old Magazines (OMG)

Collection of old newspapers (ONP) and old magazines (OMG) has assumed a very important part of the use of recovered fibre in the last few years. This has been brought about by recognition that recovered paper is a source of fibre, concern over landfill sites and environmental pressures. The way in which different countries handle the collection of these two products does not differ to any great extent.

In Canada, where ONP and OMG represent 42-43 per cent of recovered paper collected in 1994, curbside collection in blue boxes and multi-unit building collection utilising large, metal containers are the predominant collection methods. The blue boxes and the multi-unit containers are provided, free of charge, by cities and municipalities who also arrange for collection on a set schedule. The use of large,

centrally located containers for bring-in is not widely developed because of the efficient and frequent curbside collection. Non-profit organisations (charities and schools) hold paper drives but these form only a small part of the total ONP and OMG collected. The municipalities contract private collection companies to collect this material and, in some cases, the company sorts and bales the material and, in other cases, paper merchants undertake this task.

Old newspaper and magazine collection in Finland depends primarily on households, including multi-unit dwellings. Green, fibreglass containers (usually 600 litres) are used to collect ONP, OMG and advertising material, through a well researched educational programme. The population is now sufficiently well educated in the sorting of waste fibre that the material from these boxes can be used for de-inking, often without further sorting or in some cases, with only minimal sorting. While voluntary or charitable organisations still play a role, the private sector (recovered paper merchants and waste management companies) are the major collection agencies.

Finnish architects for new residential and business buildings make provision for recovered material containers. In rural areas, paper banks or much larger community containers are set up to handle the recovered fibre from the surrounding area. Some municipalities have established recycling centres with separate containers that take plastic and glass as well as paper.

The collection of ONP/OMG in France from households and other sources is carried out in two ways -- dropping the ONP/OMG in recovered paper containers at specific sites or by door-to-door collection. Collection is carried out by municipalities or cities using their own employees, private recyclers, waste collectors and environmental/ecological associations. Depending on the collector, the ONP/OMG is sorted at source or collected as mixed recovered paper and then sorted. A Protocol, signed in March 1988, outlines the responsibilities between the public and private sectors on the gathering and collection of recovered paper, including ONP and OMG. Today, the Protocol covers 400 signed contracts affecting the collection of recovered paper from approximately 14 million inhabitants.

In Germany, graphic papers, which include ONP and OMG, represented over 55 per cent of total recovered paper collected in 1991. A combination of systems is in place throughout the country with the bring type system most popular in urban areas (500 towns and districts in Germany). Curbside systems, in which recovered paper is collected from individual households, are a distant second (199 vs. 89). In 212 municipalities, a more balanced combination of the bring and curbside systems is prevalent. The bring system includes containers located in well-marked central points within an area, and drop-off recycling centres. Recovered paper collectors remove the material on a regular schedule. The various collection methods include single-type containers; depot containers (capacity 1.1 and 5.5 m³) for private households; door to door collection carried out by non-profit organisations (popular in rural areas). Collection from containers and depots is undertaken by either private companies (waste collectors/recovered paper merchants) or municipalities.

In Japan, the volume of old newspapers collected is roughly equal to consumption, *i.e.*, the recovery rate approaches 100 per cent. Old magazines are included in the white or fine paper category and a breakout for OMG is not available; the category recovery rate is 30-31 per cent. Several different agents or collectors are involved in the Japanese collection system. Household ONP, which is the major source, is sold directly to collectors, with the most popular method apparently being ONP exchanged for toilet paper. In addition, residents' associations and collection points in shopping malls and supermarkets have a part to play (a category of special buyers collects from these facilities). Collectors of mixed grades of recovered paper are also involved. The collected waste is sold to paper stock dealers (recovered paper

merchants) who sort the waste and sell it to paper manufacturers. OMG is collected through the same channels.

The Swedish experience indicates that households are the main source of old newspapers, magazines and brochures, direct mail pieces and small volumes of paper and paperboard packaging. Three collection systems are currently being used: curbside usually in rural areas and carried out by charity organisations, local sports clubs, etc.; bring systems (paperbanks) in urban or residential areas where residents, within walking distance of the containers, deposit the recovered fibre; environmental stations placed in densely populated areas for the disposal of paper and board products, glass, metal and batteries. The responsibility for these stations usually rests with the municipality. With respect to collection of ONP and OMG, local authorities were responsible until 1 October 1994. After this date, responsibility was taken over by the producers who formed an organisation to handle collections. Recovered paper merchants and other contractors carry out the collection for the paper mills and in one case, the largest recovered paper merchant is owned by the paper industry.

In the United States, a significant increase in curbside collection of ONP has tended to replace the traditional paper drive type of collection. Curbside collection, along with local drop-off centres, are now the major source of ONP and OMG. These two systems are generally operated by local governments -- in some cases using their own employees to perform collections while, in other cases, collection services are performed by private contractors. Recently, newsprint manufacturers and integrated paper companies have established their own collection systems, have purchased existing independent paper stock companies or have formed joint venture paper stock companies with waste handlers to supply their own mills or to sell to other recycled paper manufacturers at home and abroad.

In Italy, it is the responsibility of the municipalities to organise the collection system for ONP, OMG and other recovered paper. In the municipalities where the collection system is in place, there is a mix of curbside and door-to-door collection, but in most areas, the door-to-door system is more important. Three agencies are usually involved, on a contractual basis, for the collection of these paper grades -- the municipalities, recovered paper collectors and paper mills.

In Norway, households account for approximately 70 per cent of ONP and OMG collection with the balance from publishers. From households, the material is sorted at source and can be delivered directly to the recycling or energy recovery operation. To date, the collection is mainly carried out by recovered paper merchants but municipalities and the paper mills are expected to take a greater share of responsibility in the future. Contractual arrangements will be made between municipalities or communities and paper mills or between recovered paper merchants and paper mills. In Portugal, the collection system operates mainly through recovered paper merchants who have contractual arrangements with some paper mills while other paper mills have their own collection system. A few municipalities have installed selective collection systems.

The major segment of the collection of ONP/OMG in Spain is carried out by a door-to-door system and is the responsibility of municipalities' waste collection services. In addition, selective collection through containers installed by city authorities in specific urban locations and in schools is also a contributor to the recycle stream. A small amount of ONP/OMG is collected by charitable organisations. The recovered material is usually sold to recovered paper merchants and then to paper manufacturers.

The collection of ONP and OMG in Switzerland is the responsibility of the local authorities and is done through both curbside and bring-in systems. In urban areas, municipalities and recovered paper merchants are responsible for collection, while in rural areas, schools, sports associations and charities do the collecting. Two kinds of collection arrangements are in force -- mixed collection which includes

ONP, OMG and OCC; and separate collection for ONP and OMG and for OCC. To collect ONP and OMG from industrial/commercial firms, the same arrangements made for households are used. In some cases, paper mills, after delivering newsprint to publishers, will return with newsprint roll ends or over-issued newspapers. Publishers may place containers next to newspaper boxes in order to collect ONP.

In Turkey, there is no organised collection system but, on an *ad hoc* basis, some municipalities, private companies, social clubs and individuals collect mixed grades and when enough volume is collected, the material is sold directly to paper mills. Some of the mills have contractual arrangements with recovered paper merchants who have sorting and baling facilities.

In the United Kingdom, old and new newspapers and magazines account for 28 per cent, in weight, of recovered paper collected. The chief source of ONP and OMG is the paper banks or containers located at recycling centres throughout the country. There are about 8 000 banks currently in place with the number expected to grow to near the 12 000 mark within the next 2-3 years. Recovered paper merchants and waste management companies are responsible for the major part of the collection, with the latter also performing a sorting function. About 70 per cent of recovered paper merchants are owned outright by paper mills. Reel ends and over-issue copies of newspapers are collected from publishers by both waste management and recovered paper companies. Curbside collection is in place in some areas but does not appear to be a significant factor. Voluntary or non-profit groups do not play a significant part in the collection system.

2. Old Corrugated Containers (OCC)

The collection of old corrugated containers (OCC) has been carried out for many years in most OECD countries. In Canada, OCC is collected from commercial establishments, industrial complexes and institutions such as schools, hospitals, etc., and, in 1994, accounted for 34 per cent of all recovered fibre collected (32 per cent in 1993). Private companies form the major part of the industrial/commercial collection systems. These companies may be contracted by the industrial/commercial firms themselves if they have a volume of waste fibre large enough to make this hiring an economic proposition. For small to medium-sized firms, recovered paper merchants may be an intermediary between the firms and the paper mills. The merchant is responsible for organising the collection and sale to the mills. Several large Canadian integrated paper manufacturers have set up specific wholly owned Divisions within the company to collect recovered fibre and arrange for the sale of the fibre to the company's manufacturing division. In some cities, private depots are located in large, centrally located shopping malls to specifically collect OCC. In other cases, public authorities set up waste disposal depots that have provision for acceptance of OCC. Usually staffed by volunteers, these depots open one or two days a week.

The collection of OCC from the commercial sector in Finland has been well established over a number of years and reached 95 000 tonnes in 1995. Approximately 74 per cent of corrugated cardboard consumed is recycled. Shops and supermarkets are mandated by local ordinances to collect OCC. Through the use of special racks (each rack holds 50-80 kg of folded cardboard), usually provided by the industry-owned company, Paperinkerys Oy, any company that produces more than 50 kg/week is legally bound to collect the material. The collection is arranged by local recovered paper merchants who enter into a contract with the supplying establishment. The material is then delivered to one of the Paperinkerys Oy's plants located at various places around the country, sorted and baled for shipment to paper mills. A recent development involves Paperinkerys Oy participating directly in the collection system.

In France, collection of OCC is undertaken by private companies, waste collectors, municipal services or through the bring system to containers located at specific sites. Whether or not the waste is

sorted depends on the arrangements made between the parties involved. The collection includes waste from packaging manufacturers and packaging discarded by stores, industrial and commercial establishments and households, although the latter is not an important source in France.

The German system consists of placing depot containers or compacting containers with companies in the commercial and industrial sectors. Private recovered paper merchants are usually responsible for the collection of this material, which includes OCC. In many cases, contracts are signed between the recovered paper merchants and municipalities. The recovery rate of packaging material "including OCC" is over 90 per cent. This type of co-operation is necessary because the municipalities have the capability to supply the containers, and the recovered paper merchant has the know-how to correctly sort and compact the waste and the capacity to sell and deliver the recovered paper to the paper manufacturer.

Japan has an OCC recovery rate of over 70 per cent. To maintain this volume, households, shopping centres, supermarkets, other commercial facilities and industrial concerns are encouraged to save OCC for recycling. OCC is collected, sorted and sold to paper manufacturers through the same channels as ONP, with the collection emphasis on commercial and industrial establishments. Again, municipal/local governments have some responsibility to ensure the highest recovery rate and efficient collection of this product.

In Spain, the largest volume of OCC is collected in containers that are located in sites where a viable and economic volume can be collected. This includes shopping centres and other commercial facilities, paper packaging producers, schools, etc. Recovered paper merchants play an important part in the collection, sorting and sale of the sorted paper packaging waste.

In Sweden, the rate of recovery of OCC is about 75 per cent. OCC is collected in shops and companies receiving and using significant volumes of this type of packaging, while minor quantities are collected from hospitals, catering and other service industry firms. There are initiatives currently underway to increase the recovery of OCC from pre-sorted or unsorted waste generated in industrial and construction sites. Most supermarkets and bigger stores (department stores) have equipment which enables them to produce small bales which are collected by recovered paper merchants or by other contractors. Approximately half of the OCC from households is collected, together with consumer packaging or, to a minor extent, with ONP, by curbside collection or, more frequently, by the bring system. As was the case with old newspapers and magazines, the responsibility for collection has been taken over by a producer-owned organisation.

In the United States, OCC, in 1994, represented 46 per cent of all recovered fibre and largely comes from retail/wholesale establishments, particularly food stores. To a lesser extent, OCC is also collected at factories, offices and households. Traditionally, OCC has not been an important recovered material from households. While most residential curbside recycling programmes in the United States do not yet recover OCC -- those cities that do are primarily large cities -- this situation appears to be changing. More municipalities are examining whether or not OCC can be economically added to existing curbside collection programmes. While gains from avoided tipping fees can be significant, the costs involved are still significant. However, it is easy for residents to identify and separate used corrugated containers, and, because OCC represents a large proportion of the residential waste stream in the United States (larger than magazines, according to the US EPA), there is significant potential to gain economies of scale. Approximately 90 per cent of this recovered fibre is collected by private, commercial haulers. As with ONP, some manufacturers of paperboard have set up their own collection systems, purchased recovered paper handlers or formed joint companies with solid waste haulers.

In Italy, in 1994, OCC accounted for approximately 50 per cent of all recovered fibre collected. The collection of this material is almost exclusively carried out by recovered paper merchants. There are an estimated 300 companies in this business in the country and it is well developed and established. These merchants usually sort and bale the OCC prior to delivery to the paper mills. It has not been usual for paper mills to operate the collection system but, recently, there has been some movement in this direction.

The collection of OCC in Norway, in 1994, accounted for approximately 35 per cent of all recovered fibre collected. To-date, collection has been mainly in the hands of recovered paper merchants but the Norwegian municipalities and the paper producers are becoming more involved in this activity. Paper mills are expected to be the major factor in OCC collection in the near future.

In Portugal, there appears to be no regular programme for collecting this product. The Portuguese government will be studying and implementing the European Union Council's Directive that sets targets and deadlines for the recovery and recycling of packaging waste.

Switzerland's local authorities are responsible for the collection of recovered fibre from commercial firms. This will include the collection of OCC. The collection is handled by either the local authorities themselves or by contract with recovered paper merchants. In some cases, suppliers are obliged to recover their transportation packaging. Collection from industrial sites is handled by private contractors working directly with the industrial firms or through a recovered paper merchant.

In Turkey, over 53 per cent of recovered fibre was attributed to OCC in 1994. As with ONP, there is no organised collection system in effect, although private companies (recovered paper merchants) and individuals are doing some work in this area. In addition, municipalities and non-profit organisations are beginning to implement collection of recovered fibre.

The United Kingdom's packaging waste share, including OCC, of the total recovered paper volume collected in 1994 was 50 per cent. Most industrial and commercial recovered paper is collected by recovered paper merchants who collect from the entire range of such establishments where sufficient quantities are available. Recovered paper merchants also collect from supermarkets, etc., in shopping centres/retail parks, as do waste management companies. Waste management companies pick up all types of waste material from these sources (and where established, from curbside collection points) and also perform the sorting function.

3. *Other Papers*

This category of paper includes office papers, old telephone books (in some countries, included in ONP/OMP), computer printouts, scrap or recovered paper from printing shops, stationery stores and other fine or white papers. The potential for collecting usable fibre from these sources has recently been recognised and collection systems are rapidly being developed in most OECD countries to take advantage of this large volume of fibre. The usual method of collecting this grade of fibre is by placing special containers in each office or work station.

In Canadian federal and provincial government offices, for example, blue plastic baskets are used. This method has now spread to the private sector with encouraging results.

In Finland, special cardboard recovered paper baskets serve this purpose, and as an alternative in some office buildings, large fibreglass lockable containers are placed in corridors to gather the reusable fibre. In Germany, collection is carried out by recovered paper merchants and by specialised recovered paper merchants having the capability of destroying confidential files and other material.

The Swedish experience indicates that office collection has become more frequent in the last few years. In Sweden, where office collection is organised, small paper collection boxes are placed in each office/room.

Other respondents mentioning collection of this grade of paper are France, Italy, Norway, Portugal, Turkey, Switzerland, the United Kingdom and the United States.

The main way to remove the paper from office and other buildings is to hire private waste management companies or paper merchants. The question of sorting office waste is an important one and is receiving attention in most countries. Collecting by grade is obviously more economical, but this involves an extensive and perhaps time consuming educational programme. Guidelines are usually provided to office workers but, in most cases in Canada, for example, this provides only a rudimentary sorting. If only elementary or no sorting is done and all office paper grades are mixed together, higher recovery rates are likely.

III. Roles and Responsibilities

1. *The Private Sector*

The paper industry, and particularly the packaging sector, utilised recovered paper fibre prior to environmental and landfill issues becoming important. In addition, charities, schools and other non-profit organisations regularly held paper drives for ONP and OMG in order to raise funds for their activities. As the development of technology permitted paper and paperboard manufacturers to use larger volumes of different paper grades, companies instituted plans to take advantage of this available, economical source of fibre. Before pressure on governments to consider waste recycling initiatives, the private waste management sector had developed a system of collection, sorting and delivery to plants that provides paper manufacturers with a viable and reliable source of recovered paper and board. As these systems develop, the international trade in recovered paper has grown. The private waste management sector plays an increasing role in this trade.

Social and economic pressures provided the impetus for waste management companies/paper merchants to expand and modernise their collection systems. For example, the introduction by local authorities of the blue box system for curbside collection of household recovered paper caused a necessary increase in collection vehicles and storage/sorting facilities. The paper and paperboard manufacturers and paper collectors work together to establish guidelines or rules for grading the recovered material. This is important as paper quality is affected by the quality of the recovered fibre. Sorted recovered fibre is becoming a valued commodity.

Many pulp and paper companies have established their own pick-up truck services for the delivery of the recovered paper or, as is the case in some countries, there is an industry-wide organisation responsible for this activity. In addition to this, research and development is now carried out by many companies to promote the wider use of recovered fibre in more grades of paper and the handling, use and disposal of recovered paper residues. The private sector also has a definite and important role to play in the education/promotion required to ensure that the importance, advantages and economics of recycling recovered paper are understood by the general public.

2. *The Government Role*

The role of national governments in the use of recovered fibre is not with collection systems as such, but more with the obligation (legislation) or the suggestion (voluntary agreements) that recovered waste be collected and recycled. National governments, in many instances, mandate the level of a recovered product to be collected, usually in terms of percentage of consumption. With respect to legislation pertaining directly to collection systems, this is not a priority for central government and, at the municipal or regional level of government, where responsibility for solid waste collection lies, it is unusual to have legislation passed that designates what systems must be used.

At the national level, the government of Germany introduced legislation in 1988 that formed the legal basis for waste management handling. In 1991, the Packaging Ordinance was introduced to legislate the recycling of packaging material. Within this legislation, obligation was placed on distributors to provide suitable collecting containers in areas that could be easily reached by customers returning used packaging. In 1993, the Working Group for the Graphic Paper Chain (AGRAPA) was formed to develop a joint approach amongst interested parties for a voluntary agreement to achieve the environmental policy goals set out in the current legislation on recycling. In 1994, AGRAPA reached a negotiated agreement among its members to achieve recycling targets of 55 per cent by December 1996, and 60 per cent by the year 2000. AGRAPA presented this to the federal government as a joint commitment by the graphic paper chain. The government, in turn, welcomed and accepted the undertaking in lieu of legislative action. An amendment, the Product Recycling and Waste Management Act, came into effect in October 1996. This Act requires manufacturers and distributors to assume new product responsibility from production or printing to collection and/or disposal. In addition, the Technical Instructions on Industrial Waste stipulate that organic waste will not be allowed to go for disposal or to landfill sites.

In Japan, the Law for Promotion of Utilisation of Recovered Resources specifies a recovered paper utilisation rate of 56 per cent by the year 2005. Another piece of legislation, the Law for Promotion of Sorted Collection and Recycling of Containers and Packaging, is to come into force at the end of 1996. This legislation will set out guidelines for the collection, sorting and recycling of packaging waste by consumers, local governments, paper merchants and paper manufacturers. In addition, national government funding is provided to the Paper Recycling Promotion Centre, an agency established to promote recycling to the public, schools, businesses and industry.

As stated earlier, most national governments have passed legislation concerning the collection of solid waste in general or specifically for the collection of paper. For example, Sweden passed national legislation in May 1993 that has shifted responsibility for the collection of ONP, OMG, OCC and other paper packaging from local authorities to producers. Later, graphic paper grades, *i.e.*, office papers, will be subject to the same legislation. In response, the producers formed companies to undertake the collection and transport of the paper and other connected activities. The government has also indicated that when recycled paper cannot be used as raw material and when the material recycling goals are fulfilled, efforts should be made to incinerate the paper for the recovery of energy instead of dumping it in landfill.

In the United States, no federal legislation is in place. However, more than 40 US state governments have solid waste reduction or recycling goals ranging from 15 to 70 per cent with a target date of the year 2000. In 35 of these states, recycling goals are legislated. Prior to the courts overturning municipal legislation, municipalities in the United States operated the flow control concept to cover recovered materials. This legislation authorised the municipal authorities to mandate collection, transportation, processing and/or disposal. The municipalities have asked the federal government to reinstate this legislation.

In 1993, the United Kingdom government introduced the concept of producer responsibility for the packaging and ONP streams. In response, the packaging industry established the Producer Responsibility Group and the Group is now formulating its mandate and goals. The government passed the Environment Act 1995, allowing the government to introduce legislation on levels of re-use, recovery and recycling. Regulations concerning the packaging industry will be in place by mid-1996 and will conform with the EU Directive on Packaging and Packaging Waste. In 1993, the UK newspaper industry agreed to aim for a 40 per cent recycled content in newsprint consumed in the United Kingdom by the end of the decade. This plan is currently being studied by the government.

National and local government regulations in Finland concerning recovery of recovered paper and board aim at set percentages of consumption of these products. The regulations are in place as much to reduce pressures on landfill sites as to provide recovered fibre for the paper industry. The recovery of recovered paper beyond an economically viable point is not an incentive due to the fact that Finland, along with other northern countries, is seen as a supplier of virgin softwood and hardwood fibre. However, the government has introduced legislation that shifts responsibility to the producers. This will not cause any particular problems because the Finnish organisation, Paperinkerys Oy (owned by the industry), already has the infrastructure in place to handle all aspects of the recovered fibre activity. In addition, there exists, in many of the larger municipalities, legislation that mandates the collection of recovered materials for dwellings that house five or more families.

The French government has enacted a specific legislation concerning used packaging: one for household package, the collection of which is the obligation of the producers of the products packaged; another for industrial and commercial packages, for which the recovery obligation lies with the respective industrial or commercial activities.

Italy is currently studying the EU Directive on Packaging and Packaging Waste with the intent of adapting it to Italian conditions in the field of collection of recovered material. In 1988, a law was enacted that mandated municipalities to organise selective collection systems for paper and board and other recovered materials. To date, relatively few of the 8 100 municipalities have established the required systems. In anticipation of municipalities moving to set up collection arrangements and to work with those that have, the associations representing the paper producers, printers and converters founded a voluntary consortium in early 1995.

In Norway, there is only one regulation concerning collection and recycling of papers. It was introduced in May 1994, and states that companies, institutions, etc., that generate more than 250 kg of corrugated and cardboard waste per year, must gather this for shipment to a recycling facility. Some remote areas are exempt from this regulation mainly because distances make this activity uneconomic.

Portugal is another country that is implementing the EU Directive on Packaging and Packaging Waste. Spain passed a decree in December 1994 that promotes the collection and recycling of recovered paper. This decree is aimed at the protection and improvement of the environment and, under the decree, the minimum national objective is to have a waste collection container for every 2 000 inhabitants. The local authorities have been given the responsibility for signing contracts with waste collectors and paper manufacturers to ensure paper is collected and recycled.

In the United Kingdom, under the Environmental Protection Act 1990, local authorities are required to prepare recycling plans. Assistance is available to implement these plans through programmes initiated by the national government. The incentives take the form of loan guarantees and apply to the capital costs of recycling schemes, including those for paper and paperboard. Local authorities can also

take advantage of Recycling Credits, which is a programme that passes on to recyclers the savings generated in diverting material away from landfill sites.

There is no apparent specific levy for the collection of recovered paper from households. In several countries, however, there is a municipal or regional tax for solid waste collection, including recovered paper. Included in this tax is the cost that municipalities must pay to dispose of the solid waste in landfill sites. Canada and Finland are examples in this latter category.

In the United Kingdom, the government is proposing to introduce a landfill tax in October 1996, but as yet the details on the rate of tax are not available.

IV. Economic Aspects of Collection Systems

1. Costs

The question of the cost of collecting recovered material is of prime importance. There are a number of factors that affect the cost, amongst which transportation, especially for the bulk grades (ONP and OCC), plays a large part. Other factors include frequency of pickup, volume, whether or not the recovered fibre is collected separately or together with other solid waste, and how the cost is allocated between the various waste streams.

Canadian municipalities generally underwrite the cost of curbside collection, although a tax for this is included in the municipal property tax.

In Sweden, the cost for collection of consumer packaging in households is about double or more than the cost of collecting the bulk grades, such as old newspapers and magazines.

In Finland, costs are comparatively low, a factor attributed to the long running educational programme emphasizing the advantages of sorting at source.

In the United States, cost recovery varies between commercial and residential waste streams. Commercial and industrial collection is performed by commercial haulers, therefore costs must be recovered by the hauler. This is normally done by supplementing sales revenues with collection fees. Residential collection, however, is generally underwritten by municipalities, and therefore cost recovery, to this point in time, has not had the same importance.

Given the cyclical nature of the paper industry, the supply of and demand for recovered fibre plays a significant role in determining the economics of the collection process. Furthermore, given the high elasticities of price against supply/demand for recovered paper, over-supply can have serious disruptive effects on unsubsidised collection systems. Sometimes a negative process can result.

In North America, in 1994 and 1995, the price of recovered paper reached new highs because demand for most grades of paper exceeded supply, generating significant pressure on fibre supply. As a result, collection of recovered fibre was profitable at that time.

2. *Innovations and Quality*

Innovation can be viewed from the standpoint of changes in the equipment and machinery used in the collection process to the development of technology in the mill that will allow the increased use of recovered fibre. This latter point, which includes cost effective processing of recycled fibre, the improved bleaching of de-inked pulp and the combination of chemical and mechanical treatment, is important in that it relieves pressure on sources of virgin fibre. An example of this is the use of OMG in newsprint and the newly evolving use of OCC in fine papers.

However, no amount of innovation in equipment and machinery can change the fact that paper cannot be recycled indefinitely, due to the inevitable deterioration of paper fibres. Thus, it must be recognised that the production of new paper products will always require a continuous infusion of new fibre along with recovered fibre. Thus, there must be ways of disposing of this true waste -- such as incineration -- preferably with energy recovery.

In Finland, an interesting development in the transportation sector of the collection system has recently been put into place. It involves 24-hour, closed circuit, automatic loading stations for loose household recovered paper (ONP, OMG, advertising). Special railway cars are placed on sidings. When deliveries are made, the truck operator, with a push-button control, can activate the roof of the railway car and deposit his truckload directly into the car. Other studies underway in Finland include automatic sorting processes that will require no manning. A sensor worn by workers will automatically stop a conveyor belt should the worker fall onto the belt while in use.

In Sweden, a recent development in some paper mills is the use of a drill or probe that removes a core sample from the bale of recovered paper. This allows the study of the quality of the material within the bale as well as providing the opportunity to read the moisture content. Compactor trucks have been modified to make them more efficient and large collection container/bins have been better adapted to paper collection.

Several projects have been initiated across Canada to reduce the cost of recovered paper collection. For example, a small city in Ontario has introduced a user-pay system for household collection. The results show that an estimated 50-60 per cent (by weight) of the waste is now diverted from landfill. In addition, collection of OCC has doubled, as has the number of blue boxes used for collection of ONP. A city in British Columbia initiated a user-pay system by allowing householders one 100 litre garbage can per week, funded through the municipal tax base. Additional containers are charged a separate fee. The municipality experienced an 18 per cent reduction in the amount of residential waste collected. In another project in Ontario, a new apartment building incorporated a three-chute system designed to collect and separate recovered paper in the building. The programme targets ONP, OCC, OMG and other materials.

In the United Kingdom, safety considerations are assuming greater importance, *i.e.* the extended use of sprinkler systems in recovered paper depots. On the manufacturing side, new technology in the packaging sector enables manufacturers to use fibre from sources not previously acceptable. Examples of waste in this instance include envelopes and old telephone books.

3. Education/Promotion

The use of electronic and print media to promote the collection of recovered paper, particularly ONP, OMG and OCC, in households is growing in many countries. This advertising or promotion is being carried out by both government and industry as a continuing advertising process involving both public and private agencies is considered essential. In North America and in Scandinavia, governments and the paper industry have initiated programmes to sensitise the public to the advantages of recycling.

In Canada, the federal, provincial and local levels of government have undertaken programmes, through the media, to encourage collection and, in some cases, sorting of recovered paper and board. The objective of governments is to reduce the pressure on landfill sites and the industry objective relates to using the recovered paper collected as an important viable source of fibre. The Canadian pulp and paper industry has done a great deal of work through the Canadian Pulp and Paper Association which supported a public education programme through schools and the media. In addition, many Canadian companies have their own initiatives to educate the public as well as their own employees to the advantages of recycling.

In Finland, the major participant in educating the public on recycling is the industry owned organisation, Paperinkerys Oy. For example, education on this subject begins at the elementary school level. Also, documentation aimed at the collection of OCC is printed and distributed to shops, supermarkets, etc., in order to ensure that as much volume as possible is saved.

The industry-owned organisation in Sweden operates in much the same way, again to promote recycling and to increase the volume of recovered fibre available for collection.

In the United Kingdom, the government is studying a future national promotion campaign for recycling. This initiative will take place within the context of the government's approach to sustainable waste management as set out in the draft document, "A Waste Strategy for England and Wales". The government is now exploring with a citizen's sustainable development group how best to promote, in particular, waste reduction as set out in the draft strategy to the public by using the skills and expertise of local authorities, businesses and voluntary organisations. The UK government also helps fund Waste Watch, a national organisation responsible for promoting recycling and waste minimisation plus the operation of a public help-line and information service.

In the United States, programmes to increase collection are the responsibility of the municipality/commercial contractor that is operating the collection system. In most cases it is the municipality that will organise a separation programme in the hope of increasing the efficiency of collection. The success of these programmes has been varied. In other cases, mills and/or commercial haulers also sponsor or participate in educational/promotional programmes designed to encourage separation of products for waste collection from households. These programmes generally entail the co-operation of local schools, merchants and government and normally combine educational programmes with a paper drive to benefit a local cause. Mills and commercial haulers find these programmes beneficial because, if the programme is successful in permanently increasing the level of collection and sorting, costs are reduced and the consistency of fibre quality improved.

The Italian consortium, COMIECO, established by industry in early 1995, will have as one of its activities, the promotion of recycling paper products. This programme is envisaged to work in co-operation with the local authorities and other interested parties.

In Norway, industry-owned organisations work with the Ministry of Environment to promote the collection of recovered fibre and to encourage households and other collectors to increase the amount collected.

In the United States, the State of Florida introduced an Advanced Disposal Fee (ADF) on packaging materials that do not meet certain recycling rates. The purpose of the programme was to increase recycling and the use of recovered materials. However, at the end of 1995, the Florida state legislature allowed the ADF to lapse because most major packaging materials segments were able to exceed the 50 per cent recycling target. In addition, the administrative costs of running the programme proved to be greater than the revenue brought in by the fee. Several other states have considered similar fees but these programmes have not been very popular with state legislatures.

In the United Kingdom, a proposed landfill tax, by increasing the cost of waste disposal, will have the practical effect of encouraging end users to produce less waste. On another level, publicity promoting recycling and waste minimisation, for example, "Watch Your Waste Week" and the government/citizens' initiative, "Going for Green", is aimed primarily at the consumer.

Finally, the collection and use of recovered paper fibre is well established and its use in the paper making process will surely continue to grow. The governments and industry in OECD countries, in general, have realised the economic and environmental benefits of recycling paper and will continue to encourage and support this important initiative. It remains to be seen what final role recycled fibre will play in the manufacturing process; that is, what is the optimum content of this fibre that can be used and still result in the properties required in the final product -- strength, opacity, brightness, etc. An additional significant factor of recent origin that affects paper mill construction is the developing trend to build paper production facilities closer to the source of recovered fibre, that is, in closer proximity to urban environments. The results of this trend on paper production, markets, new investments and the environment itself will only be fully realised over the next several years.

ANNEX I

CLASSIFICATION OF RECOVERED PAPER: CEPI LIST OF EUROPEAN STANDARD QUALITIES

Group A - Ordinary qualities

A	0	Mixed recovered paper (unsorted) Including unsorted consolidated material from households, no guarantee of absence of unusable materials.
A	1	Mixed papers and boards (unsorted) A mixture of various grades of paper and board, without restriction on short fibre content.
A	2	Mixed papers and boards (sorted) A mixture of various qualities of paper and board, containing less than 40 per cent of newspapers and magazines.
A	3	Board cuttings Shavings and cuttings of chipboard or mixed boards, free from strawboards and corrugated material.
A	4	Old supermarket packagings Used paper and board packaging, containing at least 70 per cent of corrugated board, the rest being solid boards and wrapping papers.
A	5	Old corrugated containers Used cases, sheets or cuttings or corrugated board.
A	6	New shavings of corrugated board New shavings of corrugated board free from any other paper and any trace of unusable material, crushed or shredded and guaranteed to be free from contact with any other product.
A	7	Overissue periodicals and magazines Unsold periodicals and magazines, with or without adhesive binding, strings allowed.

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| A | 8 | Overissue pams free from adhesive bindings
A mixture of unsold newspapers and periodicals and magazines, free from adhesive bindings, strings allowed. |
| A | 9 | Mixed news and pams
A mixture of newspapers and periodicals and magazines with at least 50 per cent of news, with or without adhesive bindings, strings allowed. |
| A | 10 | Mixed news and pams free from adhesive bindings
A mixture of newspapers and periodicals and magazines, with at least 60 per cent of news, free from adhesive bindings, strings allowed. |
| A | 11 | Mixed pams and magazines
Mixed old periodicals and magazines, catalogues, printed matter, directories and newspapers, with or without staples, free from hard covers. |
| A | 12 | Shredded office recovered paper (unsorted)
Shredded office recovered paper, unsorted. |

Group B - Medium qualities

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| B | 1 | Old news
Old newspapers, with less than 5 per cent of colour inserts or advertisements. |
| B | 2 | Overissue news
Unsold daily newspapers, printed on white newsprint and free from additional colour inserts or illustrated material, strings allowed. |
| B | 3 | White lined board cuttings
News cuttings of multi-ply board with at least one white liner over a grey interior or back. |
| B | 4 | Mixed coloured shavings
Printers or magazine shavings, without restrictions as to colour, mechanical pulp or coated paper content. |
| B | 5 | Bookbinders shavings
White savings, printed with various colours mainly mechanical pulp based paper, with or without adhesive bindings. |
| B | 6 | Bookbinders shavings without adhesive
White shavings, printed with various colours, mainly mechanical pulp based paper, free from adhesive bindings. |
| B | 7 | Coloured letters
Correspondence, in mixed colours, with or without print, of printing or writing paper. Free from carbon paper and hard covers. |

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| B | 8 | White woodfree books
Books, without hard covers, of woodfree white paper, black printed only. Not to contain more than 10 per cent of coated paper. |
| B | 9 | Bookquire
Woodfree misprints of books, black and white printed, free from covers. |
| B | 10 | Coloured best periodicals and magazines
White or coloured coated or uncoated periodicals and magazines, free from non-flexible covers, bindings, varnishes, non-dispersable inks and adhesives, poster papers, labels or label trim. May include heavily printed circulars and coloured shavings. Mechanical content less than 10 per cent. |
| B | 11 | White carbonless copy papers
White carbonless copy papers. |
| B | 12 | Coloured carbonless copy papers
Coloured carbonless copy papers |
| B | 13 | Bleached PE Coated board
Bleached polyethylene coated board from liquid packaging board manufacturers. |
| B | 14 | PE Coated board
Polyethylene coated board, may include unbleached board from liquid packaging board manufacturers. |
| B | 14b* | Used PE Coated board
Bleached or unbleached polyethylene coated board from used liquid food packaging. This material must be collected separately from the ordinary recovered paper stream. |
| B | 15 | Woody continuous stationery
Wood continuous stationery, may include recycled fibres. |

Group C - High qualities

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| C | 1 | Mixed light coloured printers shavings
Mixed light coloured shavings of printing and writing papers, containing at least 50 per cent of woodfree paper. |
| C | 2 | Mixed light coloured woodfree printers shavings
Mixed light coloured shavings of printing and writing papers, containing at least 90 per cent of woodfree paper. |
| C | 3 | Coloured tabulating cards
Coloured tabulating cards, printed, woodfree. |
| C | 4 | Non-impact printed woodfree white continuous stationery
Non-impact (laser) printed woodfree white continuous stationery. |

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| C | 5 | <p>Buff tabulating cards</p> <p>Natural coloured (buff) tabulating cards, printed, woodfree, max. 1 per cent of coloured marker cards. If delivered in original boxes on pallets, max. 5 per cent of coloured marker cards.</p> |
| C | 6 | <p>Mixed white letters</p> <p>Sorted white writing and printing papers, originating from office records, containing at least 60 per cent of woodfree papers per bale, free from cash books, carbon paper and non-water soluble adhesives; may contain a maximum of 3 per cent of coloured carbonless copy paper.</p> |
| C | 7 | <p>White woodfree letters</p> <p>Sorted white woodfree writing papers, originating from office records, free from cash books, carbon paper and non-water soluble adhesives; may contain a maximum of 3 per cent of coloured carbonless copy paper.</p> |
| C | 8 | <p>White woodfree continuous stationery</p> <p>White woodfree continuous stationery, may contain a maximum of 3 per cent of coloured carbonless copy paper.</p> |
| C | 9 | <p>White woodfree continuous stationery, free from colouring</p> <p>White woodfree continuous stationery, free from coloured carbonless copy paper.</p> |
| C | 10 | <p>Printed white multi-ply board</p> <p>New cuttings of lightly printed white multi-ply board, without grey plies.</p> |
| C | 11 | <p>Unprinted white multi-ply board</p> <p>New cuttings of unprinted white multi-ply board, without grey plies.</p> |
| C | 12 | <p>White newsprint</p> <p>Shavings and sheets of white unprinted newsprint, free from magazine paper.</p> |
| C | 13 | <p>White magazine paper</p> <p>Shavings and sheets of white unprinted magazine paper, free from newsprint.</p> |
| C | 14 | <p>White woody coated paper</p> <p>Shavings and sheets of white unprinted woody coated paper.</p> |
| C | 15 | <p>White woodfree coated paper</p> <p>Shavings and sheets of white unprinted woodfree coated paper.</p> |
| C | 16 | <p>White woody shavings</p> <p>Shavings and sheets of white unprinted wood containing paper, free from newsprint and magazine paper; may contain a maximum of 20 per cent of coated paper.</p> |

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| C | 17 | Mixed white shavings
Shavings and sheets of white unprinted paper, free from newsprint and magazine paper with at least 60 per cent of woodfree paper; may contain a maximum of 10 per cent of coated paper. |
| C | 18 | White woodfree shavings
Shavings and sheets of white unprinted woodfree paper; may contain a maximum of 5 per cent of coated paper. |
| C | 19 | White woodfree uncoated shavings
Shavings and sheets of white unprinted woodfree paper, free from coated paper. |
| C | 20* | White shavings
White shavings of lightly printed books or pamphlets with adhesive bindings. Mechanical content max. 50 per cent. |
| C | 21* | White shavings free from adhesive bindings
White shavings of lightly printed printing and writing paper, free from adhesive bindings. Mechanical content max. 10 per cent. |

Group D - Kraft qualities

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| D | 0 | Brown corrugated
Cases, sheets and shavings of corrugated board, with liner of kraft or testliner. |
| D | 1 | Corrugated kraft II
Cases, sheets and shavings of corrugated board, with liner of kraft or testliner, but having at least one liner made of kraft. |
| D | 2 | Corrugated kraft I
Cases, sheets and shavings of corrugated board, with kraft liners only, the fluting made from chemical or semi-chemical pulp. |
| D | 3 | Used kraft sacks
Used kraft sacks, not dusted, having contained for example, building materials or fertilisers -- excluding dye-stuffs or materials with a lasting odour. |
| D | 4 | Clean used kraft sack
Clean, used kraft sacks, which, because of their previous use, do not require dusting or which have been dusted mechanically -- excluding papers with a lasting odour. |
| D | 5 | Used kraft
Used kraft paper and board of a natural or white shade. |
| D | 6 | New kraft
Shavings and other new kraft paper and board of a natural shade. |
| D | 7* | Unbleached kraft
Unbleached kraft, printed or unprinted, one-side PE coated or PE laminated. |

ANNEX II

CLASSIFICATION OF RECOVERED PAPER: LIST OF THE AMERICAN FOREST & PAPER ASSOCIATION

The recovered paper categories used by the American Forest & Paper Association are based on the Institute of Scrap Recycling Industries' (ISRI) Scrap Specifications Circular 1994. The 51 grades and 33 specialty grades in this circular have been condensed into the five groupings, as follows:

- Mixed Papers:** Mixed papers, super mixed papers, office papers (if not de-inked or of suitable quality to be used as a pulp substitute), telephone directories, magazines and catalogues, recycled boxboard cuttings, tissue paper converting scrap if predominantly composed of recycled fiber, mill wrappers, specialty grades and all other grades not elsewhere specified.
- Newspapers:** Old newspapers, special news (including de-ink quality) overissue news, white blank news, groundwood computer printout, publication blanks, mixed ground-wood and flyleaf shavings, coated groundwood sections.
- Corrugated:** Old containers both corrugated and solid fibre, container plant cuttings, kraft paper and bags, kraft bag clippings, carrier stock and carrier stock clippings.
- Pulp Substitutes and High Grade De-inking:** Include bleached chemical grade office papers and computer printout to be de-inked or of suitable quality to be used as a pulp substitute, bleached sulphite and sulphate cuttings including tissue paper converting scrap if predominantly composed of bleached chemical pulp fibre, coated book stock. Print free grades are reported as Pulp Substitutes, and printed grades, if de-inked, are reported as High Grade De-inking.

GLOSSARY

The following terminology is used in this report:

Recycling	The process of collecting, sorting and inputting of extracted secondary fibre/raw material for the manufacture of a new material.
Recovery rate	The amount of recovered paper collected as a percentage of paper and paperboard consumed.
Recovery	Collection of recovered paper for the purpose of re-use, recycling, export, energy recovery or composting.
Recovered paper	The total quantity of fibre collected from any source of supply, in any form, for any kind of major industrial or commercial use. Waste paper which is recovered ceases to be waste as the recovery operation produces a material of beneficial use.
Waste management	Organised actions (collection, sorting, transport, disposal) to manage the waste stream.
Landfill	Sites designated for solid waste disposal.
Board	Paperboard.
ONP/OMG	Old and overissue newspapers and magazines, telephone directories, brochures, newspaper inserts, etc.
OCC	Corrugated and solid containers.
Other papers	Mixed papers and other types of recovered papers and board not elsewhere classified, <i>i.e.</i> woodfree printing and writing papers, copy paper, computer printouts, etc.
Composting	Degeneration and breakdown of fibres for use in agricultural and horticultural locations.