

Recycling and the Traveller Economy

Income, Jobs & Wealth Creation



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This present research was commissioned because of the perceived importance of recycling activities to the financial independence and well being of the Traveller community. New waste management policies are being developed in Ireland and across the E.C. that could threaten this important economic activity. As such the DTEDG aimed to achieve the following with this project:-

- (a) To present recycling as a successful case study of economic activity within the Traveller economy. This will serve to deepen understanding of this economy and thus provide indicators for appropriate policies to support the growth and development of the Traveller economy.
- (b) To establish the extent and nature of the Traveller contribution to recycling in Ireland and through this to the broader Irish economy.
- (c) To develop a policy perspective to influence the emerging waste management policy to ensure that it resources the Traveller economy rather than threatens it.

These aims have been achieved with the publication of this research. Further work is now required to impact on the new policies being developed by the Department of the Environment. This work should also involve two further studies to establish policy options in relation to access to new landfill sites that is appropriate to the Travellers, and to develop policy options in relation to new and more dynamic interfaces between social welfare and the informal economy. The DTEDG intends to pursue these activities through the new three year plan (1994-1996) being developed for its Traveller Economy Programme.

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Niall Crowley
Traveller Economy Programme

CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 Context	1
1.2 Objective of the Study	1
1.3 Project Approach	1
1.4 Report Structure	2
2.0 LEGISLATIVE CONTEXT	3
2.1 EC Policy on Waste Management	3
2.2 Irish Waste Management Policy	5
2.3 Policy on Recycling in Ireland	5
2.4 Overview of Legislation	6
3.0 TRAVELLER RECYCLING INITIATIVE - CURRENT POSITION	7
3.1 A Traveller Economy	7
3.2 The Traveller Approach to Recycling	8
3.3 Materials	11
3.4 Sources of Materials	11
3.5 Transportation, Collection and Storage	13
3.6 Material Processing	14
3.7 Markets	14
3.8 The Economics of Traveller Recycling	15
3.9 The Significance of the Traveller Recycling Initiative in the Context of the Contribution to the Settled Economy	16
4.0 SETTLED COMMUNITY RECYCLING INITIATIVE - CURRENT POSITION	17
4.1 Context	17
4.2 Approach to Recycling	17
4.3 Materials Collection in the Settled Community	18
4.3.1 <i>Bring or Bank Systems</i>	18
4.3.2 <i>Collection at Source</i>	19
4.4 Low Technology - Source Separation in Third World Countries	20
4.5 Paper Recycling	21
4.5.1 <i>Sources</i>	21
4.5.2 <i>Process</i>	22
4.5.3 <i>Markets and Products</i>	22
4.5.3.1 <i>Other Uses for Recycled Fibre</i>	23
4.6 Plastics	24
4.6.1 <i>Sources</i>	24
4.6.2 <i>Process</i>	25
4.6.3 <i>Products and Markets Analysis</i>	25
4.7 Glass	28
4.7.1 <i>Sources</i>	28
4.7.2 <i>Process</i>	28
4.7.3 <i>Products and Markets</i>	28
4.8 Textiles	29
4.8.1 <i>Sources</i>	29
4.8.2 <i>Processing</i>	29
4.8.3 <i>Products and Markets</i>	29

The information presented in this report is also the result of desk research into recycling policy and legislation at national and EC levels. Input on recycling economics was contributed by a group of economists at Trinity College Dublin.

1.4 Report Structure

This report is divided into eight sections.

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|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section One | Details the purpose of this document, context of the report and the approach taken. |
| Section Two | Outlines EC and National policy on waste management. |
| Section Three | Details background on the Traveller economy, the Traveller community's approach to recycling, an outline of the Traveller recycling system, an evaluation of the significance of the Traveller recycling initiatives to recycling in Ireland in general. |
| Section Four | Outlines the settled community's approach to recycling, looks at recycling of various materials around the world, provides a short review of recycling in Ireland and outlines the constraints to recycling in Ireland as identified by the settled community. |
| Section Five | Compares the Traveller and settled community's approach to recycling. |
| Section Six | Evaluates the constraints and opportunities facing the future development of Traveller recycling initiatives. |
| Section Seven | Contains the conclusions. |
| Section Eight | Contains the recommendations. |

2.0 LEGISLATIVE CONTEXT

Member State policy and legislation on environmental matters is increasingly influenced by EC Policy. A growing array of EC policy and directives on waste management are emerging, designed to improve and standardise waste management practices in order to conserve resources and protect the environment.

2.1 EC Policy on Waste Management

EC policy on waste management has developed through a series of environmental action programmes. The First Environmental Action Programme was adopted in 1973. It was updated and extended into new programmes in 1977, 1983 and 1988. The Second Programme, which started in 1977, defined the three basic aims of EC policy on waste management.

- To reduce waste production.
- To salvage, recycle and reuse waste.
- To dispose of non recoverable residues in a safe way.

The Fourth Programme, which ran until 1992, was based on a new awareness that environmental matters should form an integral part of the other economic, industrial, agricultural and social programmes implemented by the Community and the Member States.

The EC Waste Management Policy was published in 1989. The purpose of the policy is to define the principles, strategies and goals governing the European Community's waste management laws and activities in the medium to long term. It lists a series of concrete actions which the European Commission intends to propose to the Council for approval within the next few years. These legislative proposals and other activities are organised according to five strategic guidelines. They are:

- Prevention of waste by technologies and products.
- Recycling and reuse.
- Optimisation of final disposal.
- Regulation of transport.
- Remedial action.

The Fifth EC Environmental Action Programme was published in February 1993. This document reiterates the 1989 policy document and states that waste management strategy will be based on a ranking of priorities: waste prevention; promotion of recycling and reuse; and optimisation of final disposal methods for waste which is not reused.

The targets in the area of waste management, as set out in the Fifth EC Environmental Action Programme, include: implementation of waste management plans in Member States; stabilisation of the quantities of waste generated; recycling and reuse of consumer products; and development of markets for recycled materials. The means to achieve these targets include:

- The Landfill Directive.
- The Packaging Directive.
- A Policy on priority waste streams.
- Economic incentives and instruments.

Landfill Directive

The draft Landfill Directive is designed to standardise landfill practice throughout EC Member States so as to ensure the safe disposal of waste while protecting the environment. The Directive is designed to reduce the quantity of waste landfilled and increase the quantity recycled. The draft Directive proposes a system of regulation based on the nature of the waste rather than the nature of the specific site. Standards of site licensing will be stricter and existing licensees will have to reapply for new licences which will only be issued if the Directive's technical, operational and structural requirements are met. Landfill operators will have to contribute to a waste management fund which would be used to pay for repairing environmental damage.

Packaging Directive

The EC Draft Packaging Directive has two principal objectives. These are to reduce the environmental impacts of packaging waste and to improve the functioning of the internal Community market. At present, households and business in the Community produce some 50 million tonnes of packaging waste every year. Only 9 million tonnes are recycled. Within the past year, Germany, The Netherlands and France have introduced demanding laws and voluntary agreements to tackle the packaging waste mountain. The growing diversity of national measures threatens to erect new barriers to trade, both in packaging and packaged products.

The central feature of the Commission's proposal is a duty on Member States to ensure that, within ten years of the Directive's entry into force, 90% of all packaging materials are recovered and recycled, composted, or burned in incinerators with energy recovery equipment. At least 60% of each material would have to be recycled. Interim targets of 60% recovery and 40% recycling are also included in the proposal. However, no date is set for their achievement. Instead, the onus is on each Member State to set a suitable date.

Policy on Priority Waste Streams

EC policy on waste management included the identification of priority waste streams:

- Used tyres.
- Halogenated solvents.
- Used cars.
- Demolition waste.
- Hospital waste.
- Municipal waste.

Economic Incentives and Instruments

Economic incentives and instruments being considered include deposit refund systems and voluntary agreements.

Deposit refund schemes involve the inclusion of an extra amount of money (deposit) in the purchase price of an item. This amount of money is then refunded to the customer when the product is returned after use. Such systems can yield very high returns depending on the level of refund.

Voluntary agreements might involve manufacturers, retailers, government bodies and waste management authorities coming together in a co-operative

venture to agree to take back a specified percentage of the waste which the manufacturers are responsible for producing. Such a scheme may involve the manufacturers financing the collection and processing of the waste materials.

2.2 Irish Waste Management Policy

Waste is the last significant area of environmental regulation to be addressed by Irish legislation. Apart from the Litter Act 1982, primary legislation on land-based waste still consists principally of the Public Health (Ireland) Act 1878 and legislation deriving from this. Some provisions for waste management are made in the Local Government (Water Pollution) Acts 1977 and 1990, and the Air Pollution Act 1987. The Environmental Protection Agency Act 1992 will bring certain waste disposal operations within the scope of integrated pollution control to be operated by the Agency.

EC Directives dealing with waste have to date been implemented by a series of regulations made under the European Communities Act 1972.

2.3 Policy on Recycling in Ireland

While no coherent policy on recycling exists in Ireland, recycling schemes have been encouraged and financially supported. A grant scheme to encourage waste recycling projects in Ireland was introduced in 1989 via Circular ENV 4/89. It is administered by the Department of the Environment and disburses grants to organisations and individuals establishing recycling projects. Grants cover projects involving glass, paper, cans or plastics. A maximum of 50% of start-up capital costs only is provided. Projects funded are expected to become economically viable. The scheme was designed to be particularly suited to the activities of community groups and voluntary bodies, rather than commercial organisations.

Applications for grants are made to the Department of the Environment; often these are circulated to the relevant local authorities for comment and, where appropriate, endorsement.

In the four years to 31 December 1992, grant assistance, amounting to £1.2 million, was made available to a total of 30 recycling projects.

From a survey of the different recipients identified, carried out by Environmental Resources Limited, rates of recycling of different materials are given in Table One.

Table One - The quantities of various materials recycled by the projects in receipt of capital assistance .

Paper	7,980 tonnes
Plastic	25 tonnes
Glass	7,700 tonnes
Ferrous	113 tonnes
Non - Ferrous	285 tonnes
Total	16,103 tonnes

A total of 16,103 tonnes of material has been collected from grantees in receipt of a total of £690,515 in capital assistance grants. The grants allocated have

focused mainly on paper and plastic waste. Aluminium can recycling projects have been funded, but scrap metal projects have not.

The only Traveller initiative to receive a capital assistance grant is the Travellers' Resource Warehouse at Pavee Point. The Travellers' Resource Warehouse recycles a wide range of raw materials, such as paper, cardboard, wool, lace, timber and plastic, all of which are collected from the waste stream of businesses around the Dublin area. The Travellers' Resource Warehouse provides a valuable source of raw materials for many schools, colleges and community groups in their creative arts activities.

2.4 Overview of Legislation

In acknowledgement of the lack of coherent legislation on waste management in Ireland, the Department of the Environment have stated that it is essential for Ireland to develop a comprehensive and flexible legislative framework which will allow statutory effect to be given as necessary to new waste management initiatives. A Waste Bill is currently being drawn up by the Department of the Environment.

It is evident that forthcoming legislation and policy will be designed to encourage recycling as a method of waste management.

The Department of the Environment have already acknowledged the significance of recycling as an element in the development of a comprehensive waste management strategy for Ireland. The Department of the Environment have commissioned two studies on the issue of recycling.

In March of this year, the Department of the Environment launched the report *'Towards a Recycling Strategy for Ireland'*. This report is based on a project undertaken by Environmental Resources Limited in association with University College Dublin, the brief of which was to address the environmental and economic issues involved in recycling.

Under the STRIDE Operational Programme, the Department of the Environment commissioned a second study on the feasibility of recycling plastic sheeting waste from the agricultural, horticultural, building and commercial sectors. The final report on the project has recently been submitted to the Department of the Environment. The project was undertaken by Environmental Management and Auditing Services Ltd in association with Teagasc, The Polymer Development Centre, Consolidated Plastics, Plastic Industry Federation, Athlone RTC, Dublin Corporation and Cork County Council.

These studies provide valuable information required to develop a waste management strategy for Ireland.

3.0 TRAVELLER RECYCLING INITIATIVE - CURRENT POSITION

The Traveller community were recycling long before the term 'recycling' was defined. In Ireland, the Traveller community were certainly the vanguard of recycling, in the sense that the recycling of metals has always been a central element in the Traveller economy. The skill of tinsmithing, so important in extending the life of metalware, was dominated by Travellers.

There is a lack of recognition of the Traveller involvement in recycling which has arisen in part because of the problem of defining what constitutes recycling. In general, recycling is defined as the transformation of waste materials into useful products. There are several ways in which this can be accomplished, including:

- **Reuse.** Waste materials can be reused without significant alteration, for example, returnable milk bottles.
- **Recovery.** Waste materials are used for the manufacture of the same type of product, for example, the production of new glass from cullet.
- **Reclamation.** Waste material is reclaimed as raw material for some different product. This includes the recovery of waste energy as heat or electricity.

In general, the term recycling is taken to cover all of these processes.

Integral and crucial elements in any recycling scheme are the sourcing, transportation and segregation of materials. These initial steps in the recycling chain are frequently the factors which determine the economic viability of recycling schemes in the settled community. The Traveller community provides these vital roles in the recycling process, particularly in the scrap metal sector.

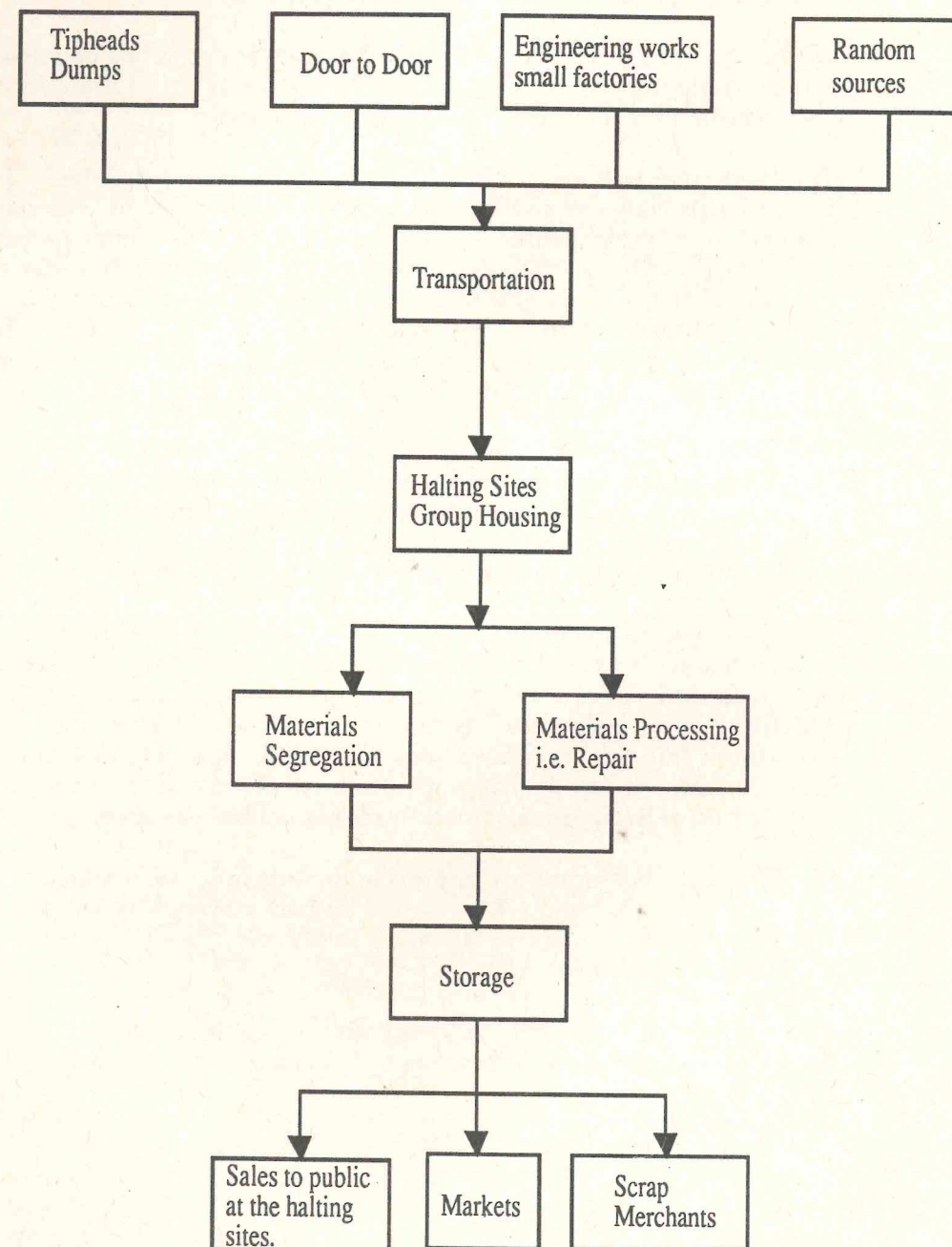
3.1 A Traveller Economy

The importance and value of the Traveller community to the overall recycling effort in Ireland is discussed in various sections of this document. Reference is made throughout to the Traveller economy. It is useful to further develop this concept, as an understanding of the distinct nature of the Traveller economy is essential if relevant strategies are to be designed to support it. Recycling is a major activity within the Traveller economy.

The distinct nature of the Traveller economy mirrors the distinct identity and culture of this community. This is an identity and culture that has shown tremendous resilience. The Traveller way of life remains vibrant despite much effort to assimilate the Travellers into the majority settled population and despite widespread hostility at all levels from the settled population. Actions that undermine the Traveller identity and culture have been accompanied by actions undermining the Traveller economy. While often a product of hostility, such actions can also be understood as a failure to recognise and understand the distinct nature of the Traveller economy.

In the past, Travellers were a rural people with a nomadic way of life based on a range of economic activities which included tinsmithing, seasonal farm labour, door-to-door sales, and recycling. This economic basis was damaged with the introduction of plastics, the mechanisation of farming, and the exodus of people from rural areas. Travellers responded to this economic crisis by moving to the urban centres and engaging in a broader range of economic activities with trading and recycling being of major importance. However, today many Travellers depend on social welfare payments.

Figure One - Schematic diagram of Traveller Recycling Operation



3.3 Materials

The Traveller community is involved in the collection and segregation of a range of materials. The traditional involvement in metals collection is still very significant. Generally, the materials which Travellers are involved in recycling can be classified as:

- Ferrous Metals** - Steel, cast iron, car bodies
- Non Ferrous Metals** - Aluminium, lead, zinc, copper, tin and brass.
- Household Items** - Discarded furniture, refrigerators, washing machines, pots and pans etc.
- Fabrics** - Clothes.
- Miscellaneous Items** - Car parts, lawnmowers.

3.4 Sources of Materials

By virtue of their mobility, Travellers have access to a number of sources of materials throughout the country. Sources include landfill sites, dumps, door-to-door collection, small industries and engineering works, and random sources throughout the country.

Landfill/Dumps

Landfills, or more commonly dumps, are an important source of materials for Traveller recycling initiatives. Access to landfill sites or dumps is organised in an informal manner and varies considerably throughout the country. Some sites are open throughout the day without restrictions on the sourcing of materials. On many sites, access is restricted to lunch hour or other limited periods of the day when machines are not operational. Other sites are completely fenced off and have tight security which poses great restrictions to materials collectors.



Photo: Derek Speirs/Report

The method of materials collection varies with the type of materials and where they are sourced. In urban areas, some of the material may be collected and transported on foot or by bicycle from the source, ie the landfill site or the dump, and taken to halting sites or group housing for storage. Larger scale sourcing of materials from dumps and landfills necessitates the use of a van for collection and transportation. The materials are generally taken to the living place for processing and storage. Scrap carts may be driven or towed to the halting site or group housing.

Door-to-door collection may take place in either urban areas or rural areas. In rural areas, involving farm-to-farm collections, a means of transport, usually a van, is necessary. All collection in rural areas is dependent on the availability of transportation.

Materials collected are generally stored at halting sites. Metals are generally segregated and stored until a sufficient quantity has been collected, or until the market price is favourable. Other items are stored until they are repaired and sold.

Some scrap merchants supply skips or containers to the halting sites for the collection of metals. Also, "grab" trucks are sent out to collect car bodies from halting sites.

Scrap metals are then either sold directly to other members of the extended Traveller family or community, who in turn sell the material to some of the scrap merchants, or are sold directly to the scrap merchants. Other items when repaired may be sold directly in markets or sold to other members of the Traveller community who sell at the markets.

3.6 Material Processing

The degree of processing carried out by the Traveller Community is dependent on the type of material collected. Apart from segregation, little processing of metals is undertaken. The burning of cables, as a method of stripping copper wire, has largely ceased as a consequence of the public health implications. Car bodies tend to be broken down into component parts. Various valuable parts are sold either directly to the public, at the markets or to Hammond Lane. Batteries may also be broken down to extract lead.

Household items, bicycles and other items are repaired at the halting site. This activity involves all members of a Traveller family, including children, who wash many of the items and adults who are involved in repair, painting and restoration.

3.7 Markets

Markets for the collected materials vary with the type of materials. Most metals collected are sold to small scrap merchants who in turn sell to larger merchants. Scrap steel is sold either directly, or via Hammond Lane, to Irish Steel Ltd. Hammond Lane supplies 50% of Irish Steel's raw materials. Scrap merchants also export steel to Britain where prices are higher. Car bodies are sold to Hammond Lane where they are processed. Car parts are either sold independently to the public at the halting sites or group housing or are sold to Hammond Lane. Cast iron is sold to foundries in either Kells or Waterford for reprocessing. Non-ferrous metals, including copper, brass, lead and aluminium, are exported and sold to Britain and continental Europe.

Some merchants have regular suppliers from within the Traveller community. Alternatively, some Travellers move in and out of recycling and move about the country and would, therefore, supply a number of different merchants. One reason Travellers move in and out of recycling is market price for materials. This mainly applies to scrap steel as the price for non-ferrous metals generally remains high enough for Travellers to be involved.

Household articles, such as furniture, washing machines, fridges and dish washers, and other items, such as lawn mowers, are repaired and sold at the various markets, including the Hill Market and Finglas Market in Dublin.

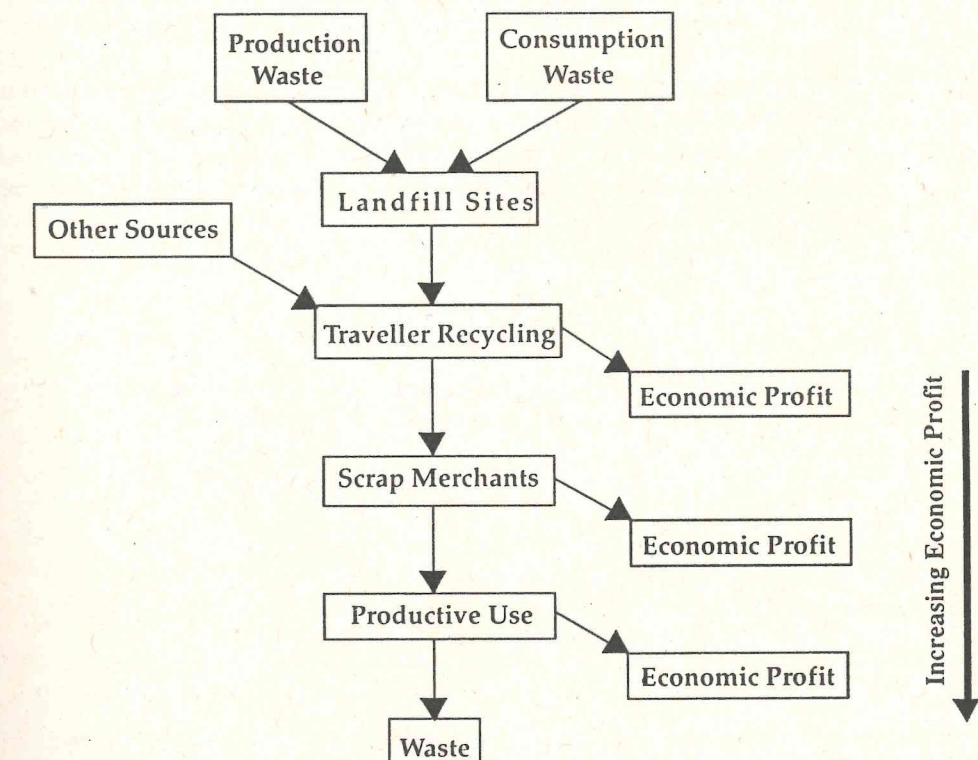
3.8 The Economics of Traveller Recycling

Figure Three outlines the economic system of Traveller recycling and indicates where economic profits occur. Materials such as cast iron, brass, copper and lead are discarded by producers and consumers, collected by Travellers, and sold to merchants. The materials are subsequently put to productive uses in the economy.

This chain of activities creates an economic profit for Travellers, scrap merchants and producers. This economic profit is considered to generate social surplus at all levels because wealth is being created. This chain of wealth creation is initiated by Travellers and would not otherwise occur without Traveller involvement. This is because Travellers exploit an economic profit opportunity that other participants in the economy overlook.

At each successive step in the chain, there is an increased level of processing of materials. Therefore the materials become increasingly valuable. This in turn increases the amount of economic profit generated, per tonne of material, at each stage.

Figure Three - Economic System of Traveller Recycling



3.9 The Significance of the Traveller Recycling Initiative in the Context of the Contribution to the Settled Economy.

As there are no existing statistics on the contribution which the Traveller Community makes to recycling in Ireland, the baseline statistics included in this section were compiled from interviews with a number of scrap merchants in Ireland. These scrap merchants are listed in Appendix One.

The percentage of scrap metal supplied by the Traveller community to scrap merchants has been quoted at between 20% and 80%, as estimated by the scrap merchants. The disparity between the figures is probably explained by the network of marketing scrap metal. Frequently, Travellers would supply metals to the smaller scrap merchants rather than the larger scrap merchants. The smaller merchants in turn supply the larger scrap merchants. Consequently, the larger scrap merchants may not identify the original source of a large percentage of their raw material as originating from the Traveller community.

It is estimated that on average 50% of scrap metal collected and supplied to scrap merchants for recycling is sourced, collected and transported by the Traveller community. This percentage may be significantly greater for some of the more valuable non-ferrous metals, however, statistics are unavailable.

The major market for scrap metal in Ireland is Irish Steel. Approximately 60% of raw material for Irish Steel is sourced from scrap metal collected in Ireland, constituting approximately 150,000 metric tonnes. Of this quantity of raw material, approximately 50% (75,000 metric tonnes) is collected and segregated by the Traveller community. The value of this scrap metal, in terms of revenue to the Irish economy is approximately £1.5 million.

According to the Trade Statistics on exports approximately 27,000 metric tonnes of non-ferrous scrap metal is exported per annum from Ireland, as no processing facilities exist for non-ferrous metal scrap in the country. The revenue generated for the export of this quantity of non-ferrous scrap contributes approximately £12 million to the Irish economy. Between 20% and 50% of non ferrous scrap is collected and segregated by the Traveller community.

It is estimated that approximately 400 jobs in the settled community are generated directly in the scrap metals industry. The future of the industry in Ireland is dependent on the collection of adequate quantities of material to support it. The Traveller community plays a key role in supporting the industry.

4.0 SETTLED COMMUNITY RECYCLING INITIATIVE - CURRENT POSITION

4.1 Context

Archaeologists have revealed that ancient civilisations could live for centuries in one location, such as a cave, without becoming buried in their own waste. By contrast, New York State is a disturbing example of a modern society virtually immersed in its own waste where 48,000 tonnes of waste per day is generated. The yearly accumulation of this on a football field would be a pile 4.6 miles high. The land resources in New York State have been unable to consume the vast quantity of waste produced, consequently, barges have been used to ferry the garbage to other states, and to Third World countries.

The upsurge in the generation of waste originates in the industrial revolution, prior to which most domestic waste was recycled. The late eighteenth century brought industrialisation, urbanisation and affluence, hand in hand with a growing wasteful society. Apart from temporary upsurges during war years, the proportion of domestic waste being recycled has shown a marked and steady decline, while the waste disposal problem has become a mirror image. Technology, convenience, comfort and a desire for status have all contributed to a steady growing mountain of waste. The present generation is probably the most wasteful this planet has tolerated or is likely to tolerate.

Traditionally, in settled communities waste management has consisted almost solely of disposal, mainly to land. Convenience and economic viability, which have not recognised the true economic and social costs of disposal, have been the main factors governing waste management or, more appropriately, waste disposal practices.

4.2 Approach to Recycling

From the nineteenth century onwards, there have been four main motivations for source separation of reusable and recyclable materials from household and commercial waste in Western countries:

- The desire of householders to recover some residual value from their waste through sale, barter, or reuse.
- Emergency resource scarcity in the society as in wartime.
- Consciousness of the need for resource conservation
- Solid waste disposal crisis.

The first and second factors have decreased in importance in settled societies in the so called First World. The current drive to increase recycling has emerged from increased awareness of the rapid exhaustion of resources, and the drastic lack of available land resources for waste disposal.

The approach taken to recycling in the settled community has tended to focus on drawing up policy and implementing legislation to increase the quantity of waste recycled and decrease the quantity of valuable material going to landfill. Targets have been set for percentages of waste which particular countries hope to achieve.

In order to achieve these targets and goals, financial assistance in the form of grants and subsidies have frequently been provided. For example the use of

deposit refund schemes in Canada, USA, Belgium, Denmark, Germany and Switzerland; and the application of product taxes in Denmark, Finland, The Netherlands, Norway and Sweden.

The financial support of some recycling schemes has resulted in the collection and reprocessing of some materials for which there are no markets or which are not economically viable.

Recycling in the settled community has focused to some extent on direct reuse but more extensively on reprocessing and reclamation. This has frequently resulted in substantial capital investment in plant which is usually only suitable to one stream of waste material. Consequently, there is limited flexibility in terms of the ability to shift to other waste streams as market demand changes.

The collection and separation of materials are two of the major constraints to recycling in settled communities. Hand sorting is frequently required which is considered to be a significant negative cost factor.

4.3 Materials Collection

The collection of waste materials in the settled community is generally undertaken in two ways in the First World:

- Bring or bank systems
- Collection at source systems

4.3.1 *Bring or Bank Systems*

"Bring" or "bank systems" involve the provision of central collection facilities for materials. Containers which are commonly known as "banks" are located at central locations, which are frequently visited by members of the public. An example of this type of system is the location of Rehab bottle banks in the car parks of many supermarkets throughout the country.

This type of system places the onus on the waste generator, which may or may not be the end-user of the product, to segregate waste products and bring them to the collection point. This system depends entirely on public participation and the degree of environmental awareness among the public sector. Consequently, participation rates tend to be variable.

'Bring' systems are generally considered to be the more cost effective. The cost to the waste disposal authority is limited to the supply of containers at the collection point, maintenance and the transportation costs when full. It is assumed that members of the public will visit the central collection point on a regular basis for other purposes, ie shopping. Therefore, the fuel costs incurred on the individual, driving to the collection point are not considered in the economic equation.

Examples of 'Bring' systems are prevalent in most First World cities. In Dublin, the location of Rehab bottle banks in supermarket car parks is a common sight. One of the best known examples of 'bring' systems' is in operation in Sheffield, Europe's first recycling city, where banks and bins are provided for almost all types of waste material.

In China, local authorities have financially supported 'bring systems'. In Zentzuji City, which has a population of 37,000, citizens separate

combustible, incombustible and recyclable materials. Returnable bottles, cullents, used cans, scrap metal, waste paper, and used clothes, are collected once a month. The profit from resource recovery activities is returned to the community association and used for social welfare. The economic incentive to group collection is an important factor to promote and expand this activity. Since the profit from this activity relies on market mechanisms for each valuable, the involvement of local government is relied upon to help stabilise prices. Approximately 30% of local government provide financial assistance to associations which practise group collection in China.

In Berlin, waste receptacles have been prevalent whenever the sales of secondary resources promised favourable returns. When prices declined so did the number of receptacles. Moreover, because of lack of financial incentive, many substances were not considered for recycling in the first place. As a result of stringent German environmental legislation, brought about by Green pressure, and the legal obligation to collect, process and dispose of the garbage mountain produced by West Berlin's 2.1 million population, the Berlin waste disposal authorities put in place a comprehensive recycling scheme to meet these demands.

The Berlin Waste Disposal Authorities started by installing recycling yards offering at source separation facilities for a limited variety of wastes. Today, glass, paper, cardboard, textiles, tyres, car oil, all types of batteries, florescent tubes, light bulbs, wood, ferrous and other metals, plastics, refrigerators and freezers and, most recently, even old bread and other spoiled dry goods, such as old pasta, flour, oats, etc, are accepted at 27 yards all over West Berlin. Most of the materials can be sold for recycling or reprocessing like CFC containing coolants from fridges and freezers, used car oil and hazardous substances, found in light bulbs and florescent tubes. The yards have been running successfully for several years.

4.3.2 *Collection at Source*

Collection systems require members of the public to segregate and store elements of the waste stream in separate storage facilities. Generally, the waste disposal authority will then collect materials at source as either part of the conventional waste collection network, or as a separate waste collection system.

As the material is collected at source, 'Collect' systems generally result in greater quantities of material for recycling. As less effort is required from the public, participation in this type of scheme tends to be higher than for 'bring' schemes. In order to guarantee participation, some waste disposal authorities do not collect unsorted waste, for example Leeds City Council. 'Collect' systems can involve significantly higher costs than 'bring' systems if a specific collection network is required.

Examples of this type of collection system are prevalent throughout the world in many First World cities. Examples include the Dublin Kerbside scheme and collection systems in Leeds, Wye, Dundee, Cardiff and Liverpool.

A unique kerbside recycling programme for high-rise housing has been launched by European Recovery and Recycling Association (ERRA) in the Sagrada Familia district of Barcelona in Spain. Approximately 75,000 inhabitants have been asked to separate recyclables including metal,

glass and plastic, paper and cardboard. These are then collected in the normal refuse collection lorries and taken to a nearby sorting facility operated by the local authority.

4.4 Low Technology - Source Separation in Third World Countries

Unlike the First World, source separation and materials recycling have persisted in the cities of the Third World, prompted by scarcity of all sorts of materials and extreme poverty. Further factors supporting source separation in cities in the Third World is the survival of many forms of reuse and repair that have disappeared or declined in affluent societies. These include the feeding of food waste to pigs and poultry and the reuse of bottles for sauces and syrups. In addition, there are many people who are willing to undertake the time consuming and low paid work of going from door-to-door obtaining recyclables.

Numerous cities in the Third World support extensive informal networks of small waste trading shops and larger dealers who channel the materials to recycling industries.

In the Philippines, waste collectors are known by a term meaning 'announced collectors' because of their distinctive calls from the street. Announced collectors are found to some extent in all cities of Third World countries seeking bottles, newspapers, cardboard, broken plastic basins, sheet plastic, tins and wood. In India, collectors specialising in obtaining old saris and cloth usually offer pots and kitchen implements in return. Similar barter arrangements survive in Japan where newspapers are exchanged for toilet paper products.

Collectors in many cities are not free agents but work for dealers and are tied to them by the advances that they obtain daily to buy recyclables. They may have to rent their carts from the dealers. Indian cities have many small shops in every district that will buy recyclables and sell to dealers. Some industries organise the collectors for themselves, as is often the case with paper mills. No city has attempted to investigate the amount of resources recovered from households, shops and businesses through these means, although it is obvious from analysis of waste received at dump sites that in the poorer Third World countries almost all significant manufactured recyclables are extracted from waste streams earlier. In China, India, Vietnam and parts of Indonesia and similar societies, waste which is dumped readily decomposes into compost without mechanical processing.

In China, source separation has been officially supported since the 1950's by the system of neighbourhood collection stations and district and regional recovery companies. People are urged to bring all recyclable materials to the stations where they are bought at fixed prices. Some stations also run second-hand shops which sell army surplus goods as well. Larger cities, like Beijing, Shanghai and Guang Zhou, had 400 to 500 neighbourhood stations, but recently at least half of these have closed down.

Their decline illustrates the problem of household income and supplementation as the motivation when standards of living rise. Most urban families no longer find it worth their time to carry materials to the stations for a very small return. The Ministry of Commerce could have overcome this by adjusting the prices paid for recyclables but, while incomes and general prices rose in the past decade, there was virtually no change in the price offered by the waste recovery system. Thus, even though resource scarcity still exists for industries, individual motivation to take items to the depots has eroded. Some waste recovery companies are trying to revive interest through lottery coupons that give discounts at department stores.

In the past decade, the relaxation of constraints upon rural migrants taking work in cities, have led to a revival of door-to-door collectors which suggest that people are still interested in selling waste if they do not have to go to the stations to do so. Ironically, Chinese households have some similarity to average Western ones with respect to source separation because they lack servants. In elite and middle class urban areas of other developing countries, it is usually the servants who have the right to household wastes, thus, the fact that selling household wastes brings very little return may not inhibit the practice.

Understanding the motivation for source separation in Bangkok, Jakarta, Rio de Janeiro or Buenos Aires, requires an examination of the wages and lifestyles of servants in addition to those of householders. When wages for domestic help improve, maids may lose interest in setting aside recyclables.

The case of Kuala Lumpur illustrates how rapid economic improvement can eliminate the itinerant collectors, thus depriving householders of the opportunity of selling recyclables, should they wish to. During the oil boom period of the 1980's, the collectors declined dramatically in numbers and the amount of recyclables of all kinds reaching garbage dumps increased. By late 1986, unemployment and a revival of waste trading, brought back the collectors and the change at the garbage dumps was noticeable. These experiences suggest that source separation based on small enterprise and private collectors can be sustained in cities of Third World countries.

4.5 Paper Recycling

4.5.1 Sources

There are a number of different types of paper which can be classified into:

- Newsprint.
- Printing and writing paper.
- Case making materials or corrugated cardboard.
- Packaging papers and boards.
- Household and toilet tissues.
- Industrial and special purpose papers.

World-wide, more than 160 million tonnes of pulp is produced each year, 95% of which is made from wood. An additional 75 million tonnes of recycled paper is produced, constituting over 225 million tonnes of new paper and board consumed. To facilitate recycling the various types of paper need to be segregated.

4.6 Plastics

4.6.1 Sources

The term plastic covers a wide range of materials. Plastics are based on giant molecules called polymers, the raw materials for which are oil and natural gas. Plastics can be broadly classified into thermo plastics and thermo setting. Thermo plastics are softened when heated and hardened again when cooled. Over 80% of plastics produced in Europe are of this type, eg plastic bags. Thermo setting are plastics which are hardened by curing and cannot be remoulded.

Table Two - Classification of Plastics

Group	Type	Use
Thermoplastic	High density Polyethylene (HDPE)	Bottles, containers, toys, houseware.
	Low density Polyethylene (LDPE)	Film, bags, flexible container.
	Polyethylene Terphylate (PET)	Bottles, food packaging.
	Polypropylene	Yoghurt and margarine (PP) pots, sweet and snack wrappers.
	Polystyrene (PS)	Dairy product containers, electrical appliances, packaging, tape cassettes.
	Polyvinyl Chloride (PVC)	Window frames, ridged pipes, flooring, wallpaper.
Thermosets	Epoxy	Adhesive, automotive components, sports equipment.
	Phenolics	Adhesives, bonding wood laminates, ovens, toasters and plugs.
	Polyurethane	

An estimated 100 million tonnes of plastic is produced world-wide each year. In 1989, some 26 million tonnes were consumed in Europe, 5% more than 1988. In total, Western Europe produces 11.5 million tonnes of plastic waste each year.

4.6.2 Process

The processes by which plastics are recycled can be broken down into:

- Mechanical
- Chemical
- Energy recovery

Mechanical recovery involves a number of steps including bailing, washing and extrusion in order to produce re-granulate or plastic pellets. Extrusion is the process of mixing and heating thermo plastic material and extruding it directly into new objects or into plastic pellets which are then used as feed stock to manufacture new plastic articles.

Chemical or feed stock recovery is a recovery process unique to plastics involving a range of plastic recovery techniques which breaks the constituent polymer molecules down to basic raw materials which can be used again in refineries or petro chemical and chemical production processes. Chemical recycling of waste plastic can produce high grade virgin polymers.

Incineration with heat recovery is probably the most applicable recycling option for plastics. Plastics have a high calorific value equal to coal and although they make up just 7% by way of municipal solid waste, they produce 50% of all of the energy produced during combustion and are a vital constituent in helping other wastes to burn.

The recycling of plastic is fraught with difficulties. One of the main difficulties being the range of types of plastics which are difficult to identify at the household level, therefore, making segregation a problem. This has been aided to some extent by the development of the American SPI system which codes the various plastics with numbers which then facilitates identification at the household level.

4.6.3 Products and Markets Analysis

Table Three outlines the type of products that can be manufactured from plastics recycling. The type of product will vary with the recycling process utilised.

Table Three - Plastic Recycling Processes and Products

Process	Feedstock	Products
Extrusion	Mono or mixed polymers	Plastic articles
Depolymerisation	Monopolymers	Monomers, Oligomers
Pyrolysis	Mono or mixed polymers	Liquid and gaseous fuels
Incineration	Mono or mixed polymers Other waste materials	Thermal or electrical power

Much of the achievements in plastics recycling have focused on Polyethylene Terphylate (PET). Polyethylene Terphylate is a plastic resin used primarily to make soft drink bottles. The primary market for recycled PET is the fibre industry which uses PET for carpet fibre and other products. Other markets include chemical, closed loop recycling which convert the waste PET back into PET containers and various mixed plastic recycling markets such as plastic lumber.

Polyethylene and polypropylene are recycled to a lesser extent than PET. However, recycling of polyethylene and polypropylene is well advanced in Central European countries, such as The Netherlands, Italy and Germany.

Italy is thought to be at the forefront of plastic film recycling. Currently a significant quantity of waste plastic film from other countries is imported as raw material for reprocessing plants. One of the main reasons for the success of the plastics recycling industry in Italy is the low collection costs due to the fact that a large portion of the collection system forms part of the submerged or informal economy (Commission of the European Communities, 1992).

At current market prices, virgin polymer is available at much lower prices than the recycled raw material, also, the virgin polymers are of much higher quality, therefore, recycled raw material is faced with stiff competition. Nevertheless, plastics are recycled. The main reasons being that, in the United States, in particular, there are bans on the landfilling of plastic articles and laws on recycled levels which much be achieved. In Europe, policy and legislation to encourage recycling of plastics is also being implemented.

Many of the existing plastics recycling schemes in Europe are generally daughter companies of the petro chemical industry. Their interest in recycling is driven by the need to be seen as a good citizen who is conscious of the environmental impacts of their actions. In order to achieve this aim, petro chemical companies, such as RECO and DSM, are prepared to subsidise recycling operations. At least 85% to 90% of the product produced by these recycled companies is marketed within the parent company.

Table Four - Examples of Recycling Schemes

Country	Scheme	Origin Waste	Nature	Collection Method	Recycling Method	Post Recycling End-use
UK	Recovery Plastics Ltd	Agriculture Distribution Municipal	Film and Bottles	Collection Banks Household	Extrusion	Agricultural Film and Others
	Dow	Supermarkets Industrial Packaging	Film	Waste Management Company Collection	Extrusion	Blow Film
	Film Association Folienverband Michelstadt	Transport Packaging	Film	On-Site Collection Bring System Farming Syndicates	Pelletising Extrusion	Various Agricultural Film
Germany	Wavin Re-use Hardenberg	Agricultural Distribution	Film	Individual Collection At Source	Re-extrusion	Refuse/ Industrial Sacks Agricultural Film
	Wavin Re-use Helmond	Agricultural Distribution	Film	Individual Collection At Source	Re-extrusion	Refuse/ Industrial Sacks Agricultural Film
	Wavin Re-use Lichtenvoorde	Packaging Distribution	Film	Individual Collection	Re-extrusion	Refuse/ Industrial Sacks

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Germany	Wavin Re-use Hardenberg	Agricultural Distribution	Film	Individual Collection At Source	Re-extrusion	Refuse/ Industrial Sacks Agricultural Film
	Wavin Re-use Helmond	Agricultural Distribution	Film	Individual Collection At Source	Re-extrusion	Refuse/ Industrial Sacks Agricultural Film
	Wavin Re-use Lichenvoorde	Packaging Distribution	Film	Individual Collection	Re-extrusion	Refuse/ Industrial Sacks

4.7 Glass

4.7.1 Sources

Glass has a variety of uses for bottles and glassware. The mixing of coloured glass can produce problems in reprocessing and off-colour in the end product. Glass can also have a number of contaminants, such as other types of glass, ie non container glass, which is chemically different from container glass; ceramics such as coffee cups and swing top closures found on several imported beers; and heat resistant glass. Both ceramics and heat resistant glass do not melt at the temperatures used in the glass container furnace and show up in the bottle as a stone or other defect.

Efficient and economical mechanical systems for colour separation are currently non existent. As a result, glass must be colour separated by hand. This is expensive and time consuming.

4.7.2 Process

The first stage in the glass recycling process is the breaking and crushing of the glass. Quite often, the neck of the bottle will be broken from the rest of the bottle as it may have a metal cap or ring on it which cannot be recycled. When the glass is crushed, it is then fed in as raw material into the furnaces in the glass manufacturing process.

There are several advantages to glass recycling. The use of cullet, ie waste glass conserves the primary raw materials as well as reducing the impact of quarrying the raw materials. Significant energy savings can also be made. The use of recycled glass reduces energy consumption in the smelting furnace. Also the energy required for the production of primary raw material (sand, lime, soda and feldspar or dolomite) is saved. Adding these two factors, results in a total saving of 100 to 120 kilograms of fuel oil per tonne of cullet used in the manufacture of hollow glassware.

4.7.3 Products and Markets

The primary market for glass containers is the glass container manufacturing industry world-wide. Other markets include:

- road construction, either on the surface (glass phalt) or a road base aggregate,
- filler in storm drain and French drain systems,
- fibre glass production,
- abrasives,
- glass foam,
- glass beads for reflective paint.

Across Europe, the glass recycling average is 32.7% according to the European Glass Container Federation (FEVE). Eleven countries are members of FEVE recycling a total of 3.1 million tonnes. Switzerland heads the league with a 55% total recovery rate. Within that figure lies 75% reuse in glass containers and 100% recycled cullet for green bottles.

In The Netherlands, 53% of glass is recycled. The Netherlands purchases 53 kilograms of glass bottles and jars yearly of which 22 kilograms are collected for reuse by the countries glass furnaces. Germany has always handled the largest volumes of scrap glass collecting 1.17 million tonnes in 1988 at a national level, ie 39% of the potential domestic supply and

also importing 128,000 tonnes bringing the cullet content of its glass containers to 51%. Italy proposes to recycle containers for all liquids. A 10% levy on raw materials for plastic bottles and a recycling tax on glass and metal containers will be imposed if the level of recycling fails to reach 50%.

The UK glass industry recycled 310,000 tonnes of cullet in 1990 which represents a recycling rate of 17.5% nationally.

In the USA, the national average for glass recovery is 25%. This has occurred since 1985 when manufacturers joined forces with workers and related companies to establish eight glass recycling organisations over twenty three states. The State of California has achieved 65% of glass recycling and is one of the largest markets for glass in the United States.

In America generally, glass recycling has not achieved the same level of success due to a number of factors such as the very low costs for virgin raw materials such as sand and limestone. Secondly, a glut of green containers due to large numbers of imported green bottles and limited American production of green bottles. Thirdly, the potential high transportation costs due to weight, and broken glass contamination of other recyclables in some collection systems.

4.8 Textiles

4.8.1 Sources

Textiles have traditionally been recycled by charity organisations around the world. In the First World countries, charities, such as Oxfam, have been collecting garments and distributing them to Third World countries or selling them. At a more local level, charities, such as Barnardos, have been collecting textiles to sell or give to the poor.

The majority of textiles available are discarded clothing. In Europe, garments disposed of to landfill sites account for an estimated 4% of domestic waste.

4.8.2 Processing

Traditionally, a large percentage of textiles were not reprocessed but were sorted, washed and re-sold for direct reuse. With increasing affluence, reprocessing has become more important as a means of recycling. Technology has existed for the last 150 years to reduce old woollen garments back to fibre. In India, this is a growth industry.

4.8.3 Products and Markets

According to the UK Textile Reclamation Association, every 1,000 kilograms of discarded textiles is used as follows:

- 16% as second hand clothing.
- 17% for fibre reclamation.
- 22% for filling materials.
- 39% as wiping cloths.
- 6% is rejected as waste.

Textiles have generally been perceived as having a low value as a reclaimed material and, therefore, have traditionally been given away

to charity organisations who in turn have sold these garments either directly for reuse or to the various sectors.

In the USA, approximately 2.5 billion pounds of textiles each year are recycled, according to the US Council for Textile Recycling. The recycling of textiles eliminates some of the environmental problems associated with textiles. Recycled wool is not re-dyed and does not have to be scoured. This results in savings on water use, energy and costs.

The UK has experienced a change over the past ten years in the end use pattern of its recycled fabrics away from apparel to upholstery use as gradually, UK mills utilising recycled wool for apparel have closed. One company, Evergreen, located in Yorkshire, has traditionally been involved in wool recycling. The principal application for its recycled fabrics is for upholstery fabrics used in contract work for hotels and offices. This accounts for approximately 75% of production. Approximately 20% to 25% of current production is for export to the USA, France, Greece and Italy. Evergreen has taken on a new initiative in that it has launched a range of garments and products which are made from fabrics composed of between 50% to 100% recycled fibres. The fact that the garments contain recycled fibre has been utilised as a marketing tool.

4.9 Furniture Recycling

4.9.1 Sources

Discarded household items and furniture have caused a significant problem for waste disposal authorities in First World countries. In many cities, large junk collection systems have been set up where, at specific times of the year, large pieces of household items which would not be collected in the normal weekly municipal collection round, will be collected from the public. Sometimes, these materials are offered to the charity organisations for direct re-sell and reuse. Quite often, a large percentage however ends up in landfills and dumps.

A number of European countries have collection systems for recycled furniture. The British Furniture Recycling Network operates across Britain and Northern Ireland. A series of projects across Britain have been established where local communities become involved in the sourcing and distribution of recycled furniture. Some furniture is directly re-sold, some is repaired and then sold.

According to the Furniture Research Network, the availability of furniture for recycling is decreasing while the demand for recycled furniture has significantly increased with the current economic recession.

4.10 Organics

4.10.1 Source

It is estimated that, in the UK, 30% to 35% of domestic refuse is compostable, in France and Germany household waste consists of around 20% compostable materials. In countries where less processed food is consumed, waste with a far higher concentration of compostable material is produced.

The compostable fraction of domestic waste includes food scraps, animal waste and soft plant materials.

4.10.2 Processing

Composting is the biological decomposition of organic waste under controlled conditions, the most important of which are aerobic conditions and elevated temperatures. Compost must be regularly aerated by turning the heap or by injecting air into the compost material for the process to be successful. In order to facilitate aeration, compost can be mixed with other materials, such as wood chips and straw, in order to give the pile structure and allow the air to flow in.

4.10.3 Products and Markets

The composting process yields an end-product which is relatively stable and can safely be applied to soil. The mature compost is a valuable substance. It can act as:

- A soil conditioner, improving soil structure especially for heavy clay soils.
- Compost also retains moisture and so helps to improve light sandy soils. It reduces soil erosion and helps to bind nutrients preventing them from being washed out of the soil.
- A soil fertiliser encouraging a vigorous root system.
- A mulch if applied around plants will smother small weeds and prevent the surface soil from drying out.
- A peat substitute for use in potting mixtures.

Many countries use composting as a process for treating domestic wastes. Nine plants in the USA, compost mixed domestic waste processing a total of 766 tonnes a day. A further 79 similar plants are at various stages of planning. In Brazil, mixed waste processing plants in Brasilia and Sao Paulo process approximately 1,000 tonnes of mixed waste per day composting 50% of the input and recycling a further 20% as paper, glass and metals. In Russia, mixed waste composting plants process 25% of the domestic waste produced in Leningrad and Minsk.

In the EC, the leaders in compost production in terms of the amount of household refuse treated are France and Italy. Around 95 composting facilities operate in France processing 1.5 million tonnes of mixed domestic waste each year to produce 650,000 tonnes of compost using a variety of methods. Italy too has a number of facilities which process either mixed domestic waste or segregated organic waste such as those collected from vegetable markets. In Germany, compost production has focused on the organic collection of the waste separately from the householder. Annual production weights of compostable refuse in Germany have been estimated at between 5 and 35 kilograms per person per year. In many cases, waste is brought by the public to recycling centres. Fifteen German cities operate composting schemes for the source separated organic collection of domestic waste.

Compost from mixed domestic waste is not easily marketed. Cases of failure to find markets have been well documented in Germany and other European countries. However, compost produced by plants in the Middle East is in such demand that in some cases would-be

customers have to join a two year waiting list. In Holland, compost produced from mixed waste is used mainly in amenity sites.

Markets have been hampered by poor quality, badly stabilised compost with visible contaminants such as pieces of glass and plastic.

4.11 Recycling in Ireland - The Current Context

Recycling in Ireland within the settled community is a relatively new phenomenon. Waste management practices in Ireland have traditionally focused on the dumping and burning of waste.

To date in Ireland, most progress in the field of recycling has been made at the industrial level. Most industries have developed technology whereby off-cuts and clean waste product produced within the factory can be fed back into the manufacturing process. Recycling of post consumer waste, with the exception of the Dublin Kerbside Scheme, is less well developed.

4.11.1 Paper

The total consumption of paper in Ireland was 376,000 tonnes in 1989 according to the Paper European Data Book. The breakdown of paper consumption is as follows:

Type	(1000 Tonnes)
Newsprint	72
Printing/writing paper	132
Corrugated Materials	73
Packaging Papers	30
Tissues	18
Speciality Paper	5
Boards	46
	376

The waste paper recovery rate is currently approximately 67,000 tonnes which represents approximately 18% of that which is consumed. Approximately 77% of this material is consumed within the Smurfit Group, either Smurfit Paper Mills, such as the paper plant at Clonskeagh or Smurfit Waste Paper.

An increasing percentage of old newspaper (ONP) is being utilised as animal bedding, by not only farmers but also horse breeders. The remainder of the waste paper generated is exported to Europe and Northern Ireland where the low grade paper is utilised in the manufacture of egg boxes at Lurgan Fibre Operatives and the higher grade paper is used in the manufacture of domestic tissue in Inversoft in Larne.

Waste paper recyclers world-wide are experiencing a recession in terms of market prices for waste paper. In Europe, the German DSD scheme, which is designed to increase the recycling of waste packaging, has resulted in a glut of waste paper on the world market.

Considering the current economic conditions, the potential for increasing the quantity of waste paper recycled is likely to come from exporting to Inversoft in Larne, which imports a high percentage of raw material from Britain at a considerable cost. Furthermore, as

only 10% of horse breeders are presently using shredded paper the potential for expansion is considered by DOE/ERL (1993) to be as great as 30-50% of the waste paper generated.

4.11.2 Plastic

Recovery of waste plastics in Ireland parallels the situation throughout the First World. Industrial waste plastic is efficiently recycled, but the collection and recycling of post consumer waste plastic is in its infancy.

The European Centre for Plastics in the Environment estimate that the total quantity of plastic consumed in Ireland is 150,000 tonnes per annum. The majority of this material after it has served its purpose will be burned or landfilled.

The two companies in Ireland which have been most extensively involved in the recycling of waste plastics are Wellman International and Superwoods Holdings.

Superwoods Holdings used contaminated plastics to manufacture a co-mingled plastic lumber which is utilised as a wood/metal substitute in a wide range of products. Products included park benches, coastal groynes, pallets, roadside markers and signs, slatted floors, tree guards, wood barriers and fencing posts. Superwoods utilised the Klobbie process which enables materials which are contaminated to be fed into the process. Superwoods marketed all their products on the domestic market. The Superwoods operation was viable with local authorities purchasing a large percentage of the products. In addition Superwoods manufactured equipment for plastic recycling which it exported. Unfortunately, Superwoods Ltd went into liquidation in 1989, however, the reasons for closure were on management grounds. The Klobbie process is in operation on a large scale in Lankhorst Recycling in The Netherlands.

Wellman International manufacture between 60,000 and 65,000 tonnes of polyester fibre per annum at their plant in Kells, Co Meath. Almost all of their waste polyester is obtained from recycled PET bottles. Most of their raw material has been imported from their sister company in The Netherlands, however, they are co-operating with Dublin Kerbside to accept the PET bottles which have been collected. The final product is used as lining for sleeping bags, pillows and quilted jackets and is also blended with wool to make carpets.

The plastics industry in Ireland is highly dependent on imported products to supply the Irish market. There are no domestic polymer producers in Ireland. Companies, such as LP Plastics and Brittas Plastics, use imported granulate (basic polymer products) to produce plastic products.

Consequently, there is a limited market for recycled raw material in Ireland. Furthermore, as the price of virgin polymer is so low, there is a limited opportunity to export recycled plastic raw material. Any existing potential probably centres around supplying PET bottles to Wellman International.

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4.11.3 Glass

Glass is very versatile and is more suitable for recycling than most other materials. Glass may be recycled either as cullet (broken glass waste) or as returnable bottles. Although collection in Ireland is growing steadily, it is low by international standards, ie 27% compared to an average of 35.7% in Europe.

Ireland's indigenous manufacturer of glass containers can absorb significant quantities of reclaimed waste glass or cullet. The Irish Glass Bottle Company (IGB) currently produces some 100,000 tonnes of glass. A high proportion of this is exported as packaging for Irish products, such as spirits and beers. Conversely, much of the glass consumed in Ireland is imported as packaging on wines, beers and food products. It is these imports which provide most of the raw material for recycling.

At present, about one-third (35,000 tonnes) of IGB's raw material requirement are provided by cullet, (including in-house breakages). This proportion could rise to 42,000 tonnes (excluding in-house cullet) without resulting in major difficulties for the company's production processes.

Consequently, there is considerable potential to increase the rate of recycling beer bottles in Ireland. This capacity is further enhanced by the requirement of Moy Insulations of Clonmel, Co Tipperary. Moy Insulations produce glass fibre insulation and are utilising cullet as raw material (DOE/ERL).

4.11.4 Metals

Scrap metal recycling is the longest running and most established of materials recycling schemes in Ireland. Ireland already has a very well developed commercial infrastructure dedicated to recovering metals.

The metal-recycling industry distinguishes between ferrous and non-ferrous metal scrap.

Ferrous Metal

There are three main sources of ferrous scrap:

- Circulating scrap, arising from the manufacture of iron and steel. The composition of this scrap is easily quantified, free from contamination, and usually recovered in-house.
- Process scrap arising during the manufacture of steel products, which takes the form of sheet cuttings, turnings and stamping. During the manufacturing process usually between 10 and 15% of the steel finishes as scrap.
- Capital or old scrap, arising from the discarding of goods which are obsolescent or worn out, eg consumer goods such as old cars. This type of scrap is not as attractive as the other two, as its composition is variable and it contains contaminants.

The scrap metal industry in Ireland deals principally with capital or old scrap. The industry is served by a network of scrap merchants

who in turn are served by a network of collectors. The Traveller community play a vital role at this level. Almost all ferrous scrap is used in the production of steel by Irish Steel in Cork.

Non-Ferrous Metals

Non-ferrous metals arise from many sources. Those which are recoverable include:

- Aluminium
- Lead
- Zinc
- Copper
- Tin
- Precious metals.

Generally, non-ferrous metal scrap is exported to Britain and Europe for re-processing. Cast iron, however, is sent to foundries in Kells and Waterford for reprocessing. Recoverable Resources in Tallaght separate and crush beverage cans for transportation to British Alcan.

Further development of the scrap metal industry in Ireland is impeded by volatile prices for metals. Increased value added in Ireland would necessitate the introduction of capital intensive chemical processing which for cost effective production must process high volumes of output. Given the high level of investment necessary, along with volatile costs and returns, and the low level of input in Ireland, there are few opportunities for expansion of scrap metal processing. Potential for expansion in the metal sector is likely to lie in exporting greater quantities.

4.11.5 Dublin Kerbside Scheme

The establishment of the Dublin Kerbside Scheme represented a major advance in terms of domestic recycling in Ireland.

Dublin Kerbside has been initiated by the partnership of local authority, Government, Chamber of Commerce and the European Recovery and Recycling Association. The scheme has been extended to approximately 25,000 houses collecting approximately 5,500 tonnes of material worth an estimated £100,000 per annum. The materials collected by the Dublin Kerbside scheme include paper, glass, plastic, metals and beverage cartons. While Dublin Kerbside have generated a lot of awareness on the recycling issue among the general public, the operation is highly subsidised, with labour input from SES schemes, and therefore is currently not economically viable.

4.11.6 Constraints and barriers to recycling in the settled community

The settled community's approach to recycling focuses on the provision of a rigid infrastructure generally for the collection and recycling of a set type of material. Recycling among many settled communities is currently considered not economically viable, without government intervention to provide financial incentives.

The major constraints and barriers to recycling in Ireland, as identified in "Towards a Recycling Strategy for Ireland", as launched by the Department of the Environment are:

- Technical
- Institutional
- Convenience
- Demographic
- Market and Economic

Technical Barriers

Technical barriers to recycling include both contaminants associated with the reclaimed materials and also inherent characteristics of the materials which may restrict their recyclability. Contaminants might include dirt, dust, moisture, ink, labels, staples, toxic residue, adhesives and fragments of other materials. There are some materials for which the technology to facilitate recycling is currently unavailable or may only be in the process of developing, eg Thermoset plastics. This is a technical barrier to recycling.

Institutional Barriers

Institutional barriers to recycling relate to public familiarity with a set way of dealing with waste, ie paying local authorities to take away waste in urban areas, or the burning of waste in rural areas.

Convenience Barriers

Recycling generally requires some effort on behalf of the public, such as separating materials, putting them in containers and bringing the materials to collection points. This method of waste management requires much greater input than traditional waste management practices in Ireland and, consequently, is a barrier to recycling.

Demographic

The population density of Ireland is quite low and, therefore, sourcing a significant quantity of material to render a recycling scheme viable requires transportation over long distances, resulting in high costs.

Market and economic

The market for recycled materials in Ireland is limited, consequently, much of the material currently collected is exported. The cost of exporting adds considerably to the cost of the reclaimed material and, unless the material has a high market value, exporting is not economically viable.

4.12 The Economics of Waste Disposal

One of the main factors affecting the economic viability of recycling in both communities is the existing method of evaluating the cost of waste disposal. The current cost mechanism for waste disposal is based on a price per tonne, which reflects the space taken up in the landfill or dump and the cost of putting it there. The potential costs of disposing of this waste in terms of environmental degradation, through production of leachate which can pollute water bodies; and landfill gas which acts as a greenhouse gas, and the cost of site closure and reclamation, do not enter the economic equation.

Therefore, the actual cost of a product to society is greater than the market price because the costs of collection and disposal of the product's waste, and the development and maintenance of landfill sites is not reflected in the cost of the good to consumers. In economic terms, waste is considered to be an "externality". A negative externality occurs when the true cost to society is not considered in the market price of a good.

Recycling brings "waste" materials back into the resource stream thereby reducing negative externalities. However, this reduction is only possible if markets for the reclaimed material exist or if there is government intervention in providing markets or subsidies.

There are a number of sound economic arguments for facilitating and encouraging the recovery of metals from the waste stream in Ireland.

- Waste metals are valuable resources which as outlined in section 3.9 generate income and employment. Therefore, the disposal of metals to landfill is a lost opportunity for financial benefit.
- Recycling metals reduces the overall cost of disposal as less space is required and, therefore, the landfill life is extended, this argument relates to all recycled materials. Prolonging the life of a landfill site is increasingly important as new sites must be designed to EC standards, which imposes a considerable cost on local authorities.
- Hazardous materials, such as lead and copper, can be leached from landfills and have the potential to contaminate water bodies. Eliminating such metals from the waste stream can prevent environmental degradation.

If the benefits to the collectors of recovered materials outweigh the costs of recovery, recycling as an activity has a net economic benefit and should be encouraged.

4.13 Social Benefits of Recycling

Besides the direct financial benefits to individual collectors, there are broader environmental and social benefits from recycling. In economic terms, these factors are considered to improve social well-being. Recycling has the following social benefits:

- Less waste to be transported and disposed of.
- Reduced loss of amenity from the development of landfill sites.
- Increased income and employment.

- Reduction of pollution caused by raw materials extraction and energy use.
- Reduction of water pollution as a result of leachate seeping from landfills.
- Reduced emissions of methane from landfill sites. (Methane is 30 times more effective as a greenhouse effect than carbon dioxide).
- Strategic benefit of having indigenous supplies of materials.
- Long term saving on non-renewable resources.

By making a significant contribution to recycling in Ireland, the Traveller community are not only generating economic benefits but are also contributing to the above mentioned social benefits associated with recycling.

5.0 TRAVELLER COMMUNITY RECYCLING VERSUS SETTLED COMMUNITY RECYCLING

This section compares the Traveller and settled community's approaches to recycling in an attempt to explore the reasons for the success of Traveller recycling initiatives.

The Traveller community has rendered the collection of metals and other material economically viable for decades in Ireland, while success in terms of recycling in the settled community has only been achieved through considerable financial support. Generally settled community recycling schemes have not attained economic viability.

The explanation for the contrasting levels of success in the two communities lies to a large extent in their differing approaches to recycling. Traveller recycling systems are organised in an informal manner, facilitating flexibility and self-employment. This approach enables the Traveller community to shift from material to material with market availability. Recycling initiatives in the settled community tend to be much more rigid, fixed on either one material or a few materials which are of low value, and in some cases for which markets are extremely limited.

Significantly, the constraints facing recycling initiatives in the Traveller community and the settled community differ considerably. It is suggested that the Traveller community's approach to recycling enables them to overcome the barriers faced by the settled community.

Table Five (see over) sets out the settled community and Traveller approaches to the various barriers to recycling as identified in the report *'Towards a recycling strategy for Ireland'*.



Photo: Derek Speirs/Report

Table Five- Comparison of the Traveller Community and the Settled Community Approach to Recycling

Barrier	Settled Community Approach	Traveller Community Approach
Technical	The sorting and segregation of metals requires either automation or high labour input, both of which are high cost factors.	Metals are sorted by hand. All members of the family and community are involved in collection and processing. Labour input is not regarded as a cost but as self-employment.
Convenience	Waste recycling is a relatively new phenomenon within the settled community, therefore, public attitudes will have to be changed, from the perception that waste has no value and should be disposed of at greatest convenience.	Recycling is an integral element in the economy of the Traveller community. Many of the waste products generated by the settled community are seen as very valuable assets to the Traveller community
Demographic	Low density of population in the settled community and the consequent spatial separation of sources of supply are a major cost factor in recycling schemes in the settled community.	The mobility of the Traveller community overcomes the low population density and disparity of materials supply, therefore, material collection and transportation are not viewed as a cost but as an element of everyday life.
Economic	Recycling initiatives in the settled community are constrained by availability of markets	Traveller recycling initiatives are constrained by the availability of markets, however, the ability to store materials and change to recycling different materials until market conditions are favourable enables the Traveller community to overcome this barrier to an extent.

6.0 TRAVELLER RECYCLING - FUTURE PROSPECTS

The future of Traveller recycling initiatives will be influenced by a range of factors many of which relate to policy decisions taken within the settled community. Such factors not only place constraints on Traveller recycling initiatives but also provide opportunities. This sections examines the constraints and opportunities for Traveller recycling initiatives.

6.1 Constraints to Traveller Recycling

6.1.1 Perception of the significance of Traveller recycling initiatives

The significance of the contribution which Travellers make to recycling in Ireland is rarely recognised. In reality, Travellers play a crucial role in the collection and transportation of scrap metal supplies for scrap merchants. The collection and transportation of recovered materials are the first steps in any recycling scheme and constitute a major cost factor.

6.1.2 Policy on access to landfill sites

Landfill sites are the major source of materials for the Traveller community. The existing policy on access to landfill sites is restrictive. Travellers have access to the landfill sites for limited periods only, while at other landfill sites access is prohibited. Traveller access to landfill sites appears to be left to the discretion of the relevant local authority. It is likely that, unless decisions are taken at a national level to facilitate access, the implementation of the EC Landfill Directive could further restrict access.

6.1.3 Policy on Recycling

While no coherent policy on recycling exists in Ireland, recycling schemes have been encouraged and supported.

State policy in the past has focused on funding low value, though high profile, materials recycling schemes, many of which have not proven to be economically viable. When financial assistance ceased many schemes failed to be able to support themselves.

Despite the achievements in scrap metal recycling, State policy has failed to recognise Traveller recycling initiatives as significant to recycling in Ireland, and consequently they have not received any financial or policy support. A capital grant scheme for recycling in Ireland has been in existence since 1989, however, Traveller recycling initiatives have received little or no direct or indirect support. The exception is the Travellers' Resource Warehouse which received capital start-up grants. Scrap metal recycling, with the exception of aluminium cans, has not received any direct support, however, this may be due to lack of grant applications.

The current funding structure for recycling schemes in Ireland is prohibitive to Traveller recycling initiatives in that funding consists of 50% of capital start up costs only. As Travellers do not have high start-up costs in terms of infrastructural investment in recycling, they currently cannot benefit from the available grants. The criteria for the selection of projects for funding is based on the need for projects to become economically viable within a short time span. In effect, many of the

Therefore, if the Traveller community can ensure that the significance of its recycling initiatives are realised at both a national and local level then future policy on recycling could act in the Traveller community's favour.

In Latin America and Asia, for example, policy on waste recycling is focusing on existing recycling schemes. Where source separation schemes are being established, waste disposal authorities are improving the existing informal practices rather than launching municipal schemes, in order to maximise source separation and increase the efficiency of the schemes.

Policy on recycling is likely to encourage a number of actions in line with EC Policy.

- The recycling of materials which have a value and for which markets readily exist will be encouraged.
- Local authorities will be encouraged to provide recycling facilities.
- Facilities or schemes to facilitate the sourcing of material before they enter the landfill, when materials are of a higher value, is likely to be encouraged.
- Financial incentives will be provided for recycling which may render recycling more economically viable. Appendix Two lists the financial instruments which have been considered to encourage recycling. Many of these incentives are not applicable to the Traveller approach to recycling.

Consequently, there are potential opportunities for the Traveller Community to consolidate and increase its involvement in recycling in Ireland as a result of the implementation of waste management policy. The Traveller community will have to take an active role in pursuing such opportunities.

6.2.2 Increased cost of waste disposal

In Ireland, current landfill charges are unrealistically low and do not reflect the true social and environmental costs to society associated with landfilling. Unrealistically low landfill charges create a disincentive for materials recovery. Within the present pricing system, local governments are subsidising waste disposal and discouraging high levels of materials recovery.

The charges for the use of landfill sites will increase substantially over the next ten years as transfer stations are required to transport waste out of cities to distant disposal sites. The cost of disposal in the Dublin area is to increase from £5 per tonne to £22 per tonne. Such an increase in charges makes resource recovery more economically viable and facilitates recycling activities.

6.2.3 Legalising the informal sector

Much of the opposition to Traveller recycling initiatives centres around the fact that such activities are carried out within the black economy, and are, therefore, regarded as illegal.

One of the main factors in the success of the Traveller recycling initiatives is that Social Welfare payments act as a basic or subsistence income, which allows the Traveller community to survive while sourcing and accumulating quantities of material. When market demand is low, materials can be stored and the Travellers can survive on the basic income received from Social Welfare.

The welfare state in Europe was created on the basis of two assumptions: that there would be full employment; and that the State had to provide income security primarily to cover "temporary interruptions, of earning power" (Standing, 1988). However, with the huge growth in unemployment in the 1980's, the demands on the social welfare system grew while the number 'making contributions' fell. At the same time, the 'Informal Sector' has become a major phenomenon.

The welfare system is restrictive in that persons in flexible employment activities are excluded from the system, those in full-time unemployment who have the opportunity to find work on a piecemeal basis are excluded from the system and, therefore these groups are forced into the informal sector.

The limitations of the social welfare system are one reason why Basic Income and Social Dividend have been put forward as alternatives. The Citizens Income Research Group, formally the Basic Income Research Group, was set up in 1984 under the auspices of the National Council for Voluntary Organisations to research all aspects of reform along the lines of a basic income. The CIRG's July 1993 bulletin states that in the absence of sufficient jobs for all the Government should introduce a basic income for all people to work and earn extra income when they do not have a job.

Social Welfare reform should be directed to gradually replace all benefits by a single transfer of income with supplements to cover specific needs, such as disability. This income would be paid to all individuals regardless of age, sex, marital status, worker status, duration of past work or tax paid (Standing ILO, 1988).

For income earners, the basic income would amount to a deductible tax credit. For non earners or low earners, it would amount to a cash payment. All income earned over and above the citizenship income would be taxable. Such a system would be practicable in the sense that it would promote labour flexibility (Standing ILO, 1988).

The basic income concept was suggested fifty years ago by Juliet Rhys Williams in a book entitled "A Suggestion For a New Social Contract". Even though this concept has existed for half a century and the need for its implementation has drastically increased with the growth of the informal sector throughout the world, Basic Income has not been introduced (Citizens Income Research Group, 1993).

As the significance of the Informal Sector increases relevant to the formal economic sector, an opportunity exists to implement basic income systems, which would legalise not only Traveller recycling initiatives in Ireland but a whole range of activities carried out within the informal economy. The timing is very apt for the relevant authorities to give serious consideration to the Basic Income theory.

7.0 CONCLUSIONS

7.1 Traveller Contribution to Recycling in Ireland

There is a lack of recognition of the importance of Traveller involvement in recycling which centres on the issue of what constitutes recycling.

Recycling activities in the Traveller community are sometimes described as unorganised, as viewed from the settled community's perspective. This situation has developed from a lack of insight into the Travelling community's approach to recycling.

An average of approximately 50% of scrap metal collected and supplied to scrap merchants for recycling is sourced, collected and transported by the Traveller community.

It is estimated that approximately 400 jobs in the settled community are generated directly in the scrap metals industry by Traveller recycling initiatives.

7.2 Constraints

The constraints to recycling in the Traveller community include: lack of recognition of the contribution which Travellers make to recycling in Ireland; restricted access to landfills and other sources of materials supply; insurance companies refusing to insure vehicles; lack of storage facilities at halting sites; and fluctuations in market prices.

The major constraints and barriers to recycling in Ireland, as identified in *"Towards a Recycling Strategy for Ireland"*, as launched by the Department of the Environment are: technical; institutional; convenience; demographic; market and economic.

The current funding structure for recycling schemes, the provision of 50% of start-up capital costs, is not applicable to the Traveller approach to recycling, and, therefore, Traveller recycling initiatives cannot benefit.

State policy on recycling in the past has focused on funding schemes to recycle low value materials, many of which have proven not to be economically viable.

If future policy on recycling continues to fail to recognise the significance of the Traveller recycling initiatives, the opportunity to build on a successful approach to recycling will be lost and the future of existing successful recycling schemes in Ireland could be threatened because of the implications of inappropriate policies and infrastructures.

7.3 Opportunities

Recycling is set to form an ever increasing element of waste management practices in Ireland, as dictated by EC Policy.

In order to meet recycling targets in Ireland, existing recycling initiatives will have to be maintained.

If the Traveller community can ensure that the significance of its initiatives are realised, then future policy on recycling could act in its favour.

Recycling in Ireland is likely to be facilitated by the provision of recycling facilities and financial instruments. The implementation of policy on recycling is likely to offer the Traveller community potential to increase their involvement in recycling.

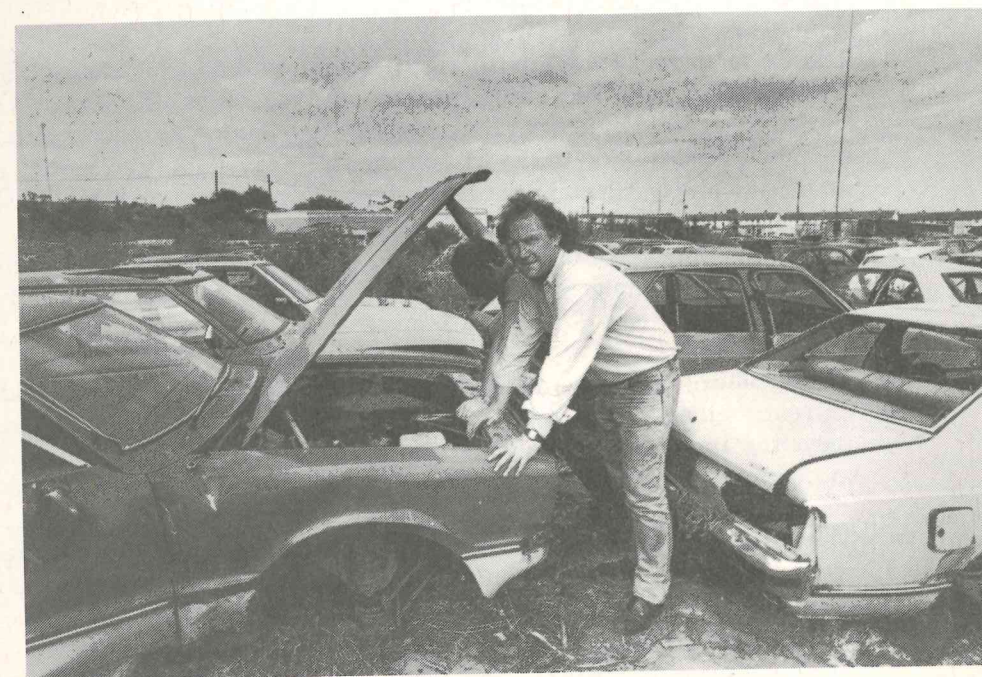


Photo: Derek Speirs/Report

8.0 RECOMMENDATIONS

The recommendations are set out in sections relevant to the various bodies concerned.

Recommendations for Department of the Environment - Waste Management Section

- The Department of the Environment, in order to encourage recycling as a means of waste management, as dictated by EC policy, should facilitate the Traveller community's recycling initiatives.
- The Department of the Environment should, in designing their policy on waste management and recycling, protect and resource the Traveller recycling initiative, in recognition not only of their contribution to recycling in Ireland, but also their contribution to the Irish economy. Traveller organisations should have an input when waste management and recycling policies are being drawn up.
- Recycling policy should be reviewed in light of the failure of many of the schemes which have been funded to date and the success of the Traveller recycling initiative.
- The structure of payments for recycling schemes should be reconsidered as the current method of payment, of 50% capital assistance grants, is not suitable to recycling in the Traveller community nor in the settled community. Funding mechanisms should be flexible to facilitate a number of approaches to recycling.
- The procedure for the selection of recycling schemes for funding should be reconsidered. The focus should be on sustainable recycling and the selection of waste streams which are economically viable to recycle.
- The social cost to the Traveller Community of changes to waste management policies, for example restricted access to landfill sites, should be considered during policy development and implementation. Negative effects resulting from policy changes should be compensated.
- The Department of the Environment should support and be actively involved in studies designed to examine policy options to address the constraints to the Traveller recycling initiative.
- Access for Travellers to landfill sites, which are a major source of materials, should be provided for. A national policy on access should be drawn up so that access is not at the discretion of various local authorities throughout the country. Given their contribution to date such policy should have Traveller access as a priority.
- Design of new landfill sites should provide safe access points for sorting waste.
- If transfer stations are to form an integral part of waste management in Ireland, there should be provision for areas where materials segregation is facilitated.
- The existing waste collection system should be reviewed to identify points earlier in the disposal chain where materials could be segregated while less contaminated by other materials and, therefore, of a higher value.
- The large junk collection system should be carried out in conjunction with the Traveller community and other recycling organisations so that material can be recycled.

Recommendations for Department of the Environment - Community Section

- A policy for the provision of Traveller accommodation which facilitates Traveller recycling and recognises the importance of the work place and living place being the same for Travellers, should be drawn up. This policy should recognise the importance of the above criteria to the economic viability of Traveller recycling.
- Halting sites and group housing should be designed with adequate provisions for recycling.
- Policy on the location of halting sites and group housing should take into consideration the proximity to the landfill sites.

Recommendations for Department of Social Welfare

- The potential to legalise elements of the informal economy should be investigated.
- The concept of Basic Income should be considered as an alternative to Social Welfare, given that flexible employment is likely to grow in importance.
- The Department of Social Welfare should support and be actively involved in studies designed to examine policy options to address the constraints to flexible employment, focusing in particular on the Traveller recycling initiative, given the contribution which Traveller recycling makes to recycling in Ireland and to the Irish economy.
- Initiatives, such as 'Back to work' schemes, should be complemented by strategies which facilitate and recognise the reality and significance of flexibility in employment, as well as the social value of recycling.

Recommendations for Travellers

- The Traveller community should recognise and maintain its significance and contribution to recycling and the Irish economy.
- The Traveller community should extend its involvement in recycling by becoming more involved in the scrap metal sector. The potential to become involved in aluminium can recycling should be investigated.
- The Traveller community must consider how it wishes to take up the opportunities offered by future policy on waste management and recycling.

Recommendations for the DTEDG

- The DTEDG should instigate further studies on Traveller recycling initiatives. A pilot project should be considered which would examine policy options to address the constraints faced by the Traveller recycling initiatives.

The pilot project would examine policy options to address the constraints to the Traveller recycling initiative. Constraints can be classified into physical constraints such as restricted access to landfills which are the main source of materials, and social constraints such as the inability of the social welfare system to facilitate flexible employment. The examination of policy options to

address these constraints will provide valuable information which will be transferable to other marginal communities throughout Europe.

- The DTEDG should play a key role in identifying the needs of the Traveller community in terms of their recycling activities. The role of the Travellers within the Irish recycling effort needs to be resourced in a manner appropriate to their distinct culture and way of life.
- The DTEDG should play a key role in defining a suitable approach to take advantage of possible opportunities emerging from waste management policy, while respecting the key features of the Traveller economy.
- The DTEDG must take a major role in educating the public, national organisations, the relevant government officials and departments, and the Traveller community, as to the significance of Traveller initiatives to recycling and the Irish economy.
- The DTEDG should compile information leaflets and literature to outline and highlight the Traveller community's role in recycling. A partnership with some of the other organisations involved in the scrap metal recycling industry should be considered as a means to promote the significance of the Traveller recycling initiative.

Recommendations for the Commission of the European Community

- The Commission of the European Communities should support and be actively involved in pilot projects designed to examine policy options to address the constraints to the Traveller recycling initiative, such as restricted access to landfills which are the main source of materials and social constraints such as the inability of the social welfare system to facilitate flexible employment
- The information provided by the pilot projects should influence EC policy on waste management and recycling so that existing recycling initiatives in Member States are resourced, and that flexible approaches to recycling which are more economically viable can be incorporated into waste management strategies. Social policies at EC levels should encourage more flexible approaches to work and employment, such as the basic income concept.
- The Commission of the European Communities should facilitate the implementation of policy changes through the relevant Funding programmes.
- The Commission of the European Communities should acknowledge the specificity of the Traveller and Gypsy economy.
- The Commission of the European Communities should ensure flexibility in labour force measures so that Travellers and Gypsies can benefit.

The next step

The Traveller Community's contribution to and significance not only to recycling, but to the Irish economy has been established in this report.

The next step is a pilot project, the objective of which will be to examine policy options to address the constraints to the Traveller recycling initiative. It is proposed that the pilot demonstration project should address constraints in two categories -

Physical constraints -

Restricted access to the source of material, in many instances landfill sites, and the lack of adequate appropriate facilities at the halting site and group housing scheme to enable material segregation and storage.

Social constraints -

The constraints and restrictions to flexible employment imposed by the current welfare system.

Policy options will be examined which will aid policy makers in both the Commission of the European Communities and national government bodies in all the member states. The pilot demonstration project will also provide valuable information which is transferable to groups experiencing social exclusion throughout the European Communities and beyond.

APPENDIX ONE

List of Scrap Merchants

Information was gathered from the following scrap merchants, through interviews and telephone surveys during the compilation of this report.

- Hammond Lane Metal
Hammond House
Sir John Rogerson's Quay
Dublin 2
Tel: 01.6779414
- McGoverns Metal Merchants Ltd
32 Ranelagh Road
Dublin 6
Tel: 01.977466
- Mullen & Sons
Clanbrassil Street Upper
Dublin 8
Tel: 01.534758
- Cummins Metal Recycling Ltd
John F Kennedy Drive
Naas Road
Dublin 12
Tel: 503028
- Cork Metal Company Ltd
Dublin Hill
Cork
Tel: 021.309910
- Galway Metal Company Ltd
Oranmore
Co Galway
Tel: 091.94358
- Hegarty Hammond Ltd
Monoclino
Ballysimon Road
Limerick
Tel: 061.418153

APPENDIX TWO

Summary of Analysis of Policy Instruments (ERL 1993)

Policy Instrument	Advantages	Disadvantages
Deposit-Refund System	High return rates. Can be used effectively to raise revenue or as an incentive for the establishment of recycling schemes.	Limited range of suitable materials. High storage and inconvenience costs. Some inequities/inefficiencies as levels of tax to raise revenue or provide incentive are higher than disposal savings.
Raw Materials Tax	Targets demand side.	Spreads burden beyond household waste stream. Problem of identifying target materials. Imports and exports problematic.
Property Rights Approaches	Effectively used in other countries to ensure industry manages waste problem.	Depends on identification of waste origin.
Waste Charges	Simple to implement	To be effective requires separate provision of recycling schemes.
Landfill Tax	Directly targets environmental damage.	May need to be very high to encourage recycling. May encourage incineration.
Subsidies	Can overcome supply and demand side barriers.	Risk of supporting inefficient firms.
Industrial Development Support	Increases levels of demand. Consistent with economic objectives.	Anti-competitive effects of subsidy schemes.
Compulsory Recycling	Can be effective.	Requires central government funding. Inconvenience costs for households.
Price Support	Targets demand side.	Trade barrier.
Preferential Purchase	Targets demand side.	Verification of product standards may be difficult. Limited coverage. May only encourage imports of recycled goods.
Recycling Credits	Passes benefits on to those responsible for the costs.	Does not provide an incentive for those most able to introduce comprehensive recycling (ie local authorities).
Material Bans	Can shift consumption to more recyclable products.	Limited range of suitable materials. Requires additional instruments to be effective.
Compulsory Use of Recycled Material	Targets demand side.	Barrier to trade.

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- DTEDG, *Nomadism Now and Then*, a slide/tape show based on interviews with Travellers about their lives and travelling.
- DTEDG, *Pavee Pictures*, a book version of the photographic essay including some additional text and photographs.
- DTEDG, *Strategic Plan 1991-1994*, a programme of activities.
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- Dublin County Council
- Cork County Council
- Cork County Borough Council
- Limerick County Council
- Limerick County Borough Council
- Galway County Council
- Galway County Borough Council
- Wexford County Council
- Louth County Council

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