Environmental RTDI Programme 2000 - 2006

A Strategy for Developing Recycling Markets in Ireland

Synthesis Report

(Project: Assessment and Evaluation of Outlets for Materials that can be Recovered from Municipal Waste (2000-MS-8-M1))

Prepared for the Environmental Protection Agency

by

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ACKNOWLEDGEMENTS

The Clean Technology Centre, Cork Institute of Technology, with assistance from the Austrian Institute of Applied Ecology, Vienna, prepared this report as part of the Environmental Research, Technological Development and Innovation (ERTDI) Programme under the Productive Sector Operational Programme 2000-2006. The ERTDI programme is financed by the Irish Government under the National Development Plan. The programme is administered on behalf of the Department of Environment and Local Government by the Environmental Protection Agency which has the statutory function of co-ordinating and promoting environmental research. The authors wish to acknowledge the support of the Environmental Protection Agency in the development of this report. The authors in particular wish to thank Dr. Matt Crowe and Ms. Kirsty Nolan of the EPA for their support and assistance. Sincere thanks are also due to the other members of the project Steering Committee: Mr. Brendan O'Neill, Department of Environment and Local Government and Ms. Katherine Walshe, Cork County Council. The authors also wish to thank all those many people who provided information and advice during the course of their research, especially all those involved in the recycling industry, from local authorities, from environmental consultancies, NGOs etc.

Environmental RTDI Programme 2000 - 2006

Published by the Environmental Protection Agency, Ireland

PRINTED ON RECYCLED PAPER

ISBN:1-84095- 091-9 **09/02/500**

PREFACE

This report was developed as part of the medium scale project: *Assessment and Evaluation of Outlets for Materials that can be Recovered from Municipal Waste (2000-MS-8-M1)*. Other deliverables related to this project include a report: *A Strategy for Developing Recycling Markets in Ireland* and Fact Sheets on each material waste stream, as follows:

1. Glass	2. Textiles	3. Ferrous Metals	3. Paper
5. Cardboard	6. Plastics	7. Non - Ferrous Metals	
8. Aluminium	9. Wood	10. Composites (used beverage cartons)	

These Fact Sheets are available on the EPA website at www.epa.ie

EXECUTIVE SUMMARY

It is clear from the best available data that the arisings of waste in Ireland are very high and that the rate of growth of these arisings is unsustainable. It is vital, therefore, that Ireland, as a matter of urgency, implements a national waste prevention plan, whereby the growth rates of waste arisings is firstly halted, and ultimately reversed.

It is also clear that the recovery rate for the reuse and recycling of this waste in Ireland leaves a great deal of room for improvement. At present the rate of waste recovery is much lower than international norms and is also well below our national targets. The recovery levels for all waste streams considered (glass, textiles, ferrous metals, paper, cardboard, plastic, non-ferrous metals, aluminium, wood and used beverage cartons) are less than acceptable.

A study of the current outlets for the recovered municipal solid waste streams considered shows that such outlets are being utilised for all these streams, both in Ireland and abroad, with the exception of used beverage cartons. A variety of such outlets for the various materials was identified and analysed in this study. Wood is the only material that is recycled solely in Ireland, currently no waste wood is being exported for recycling. All the container glass recovered in Ireland is also recycled, either in the Republic of Ireland or in a facility in Northern Ireland. However, many of the outlets for other waste streams are abroad, and this sometimes adversely affects the viability of their long term usage for a variety of reasons.

The situation regarding the export of large volumes of waste paper, cardboard and plastic in particular is problematic. There is an urgent and major requirement to increase the Irish facilities to recycle these waste streams.

Several potential new outlets for each waste stream were identified and analysed as part of this study. While some of these are more viable than others, many such outlets are worth considering, all of which are being widely utilised in other countries with higher recycling levels than Ireland.

The barriers to recycling in Ireland were also identified and analysed as part of this study. This analysis considered current general barriers to waste recovery and also specific barriers to each material waste stream. Many of these barriers are having a deleterious effect on the viability of developing a widespread culture of recycling in Ireland.

In order to overcome these barriers, a strategic approach is recommended, whereby all the required elements for a major increase in the recovery and recycling of waste can be put into place and the forces and drivers to achieve this can be managed effectively and proactively. A variety of key stakeholder groups are identified in this study whose active participation is of paramount importance.

Three levels are recommended in this strategy. At the widest level is the strategy itself in order to create a sustainable culture of recycling in Ireland. Within the strategy, and driving it, a range of tools and policy instruments are required in order to develop the proper awareness, information, economic, infrastructural and legislative conditions necessary for a higher rate of recycling. Several such recommended tools and instruments are identified and described in this report.

However, in order to bring about and deliver these instruments, several specific actions are required by the various main stakeholders. The carrying out of these

actions delivers the tools and instruments required to put into place the framework for widespread recycling. These stakeholder groups and their required actions are identified and described in this synthesis report. In particular, a range of actions is required from national government, local government, industry, recyclers, the EPA, REPAK, environmental experts, NGOs and the general public. In all, 79 such actions are recommended so that these stakeholder groups can play their role in the development of recycling in Ireland.

All stages of the recycling chain (supply, collection, processing and demand) must be developed in Ireland. All are interdependent and mutually supportive, and all require positive actions by a range of stakeholders, using a carrot and stick approach, to solve the problem.

This overall strategy to developing recycling markets for Irish waste streams must be developed and co-ordinated properly. In particular, allocation of responsibility and provision of adequate resources are required to drive forward the actions necessary to create the conditions under which a sustainable recycling system can prosper in Ireland.

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1. Introduction

Ireland's current performance regarding the reuse and recycling of waste, in particular household waste, leaves a great deal of room for improvement. Furthermore, recent trends show that current growth rates in the quantity of arisings greatly outstrip the growth rates in the quantity of amounts recycled.

These increases in arisings in turn have created a greater dependence on the use of landfill, which is currently the only disposal option in Ireland for material that has not been recovered.

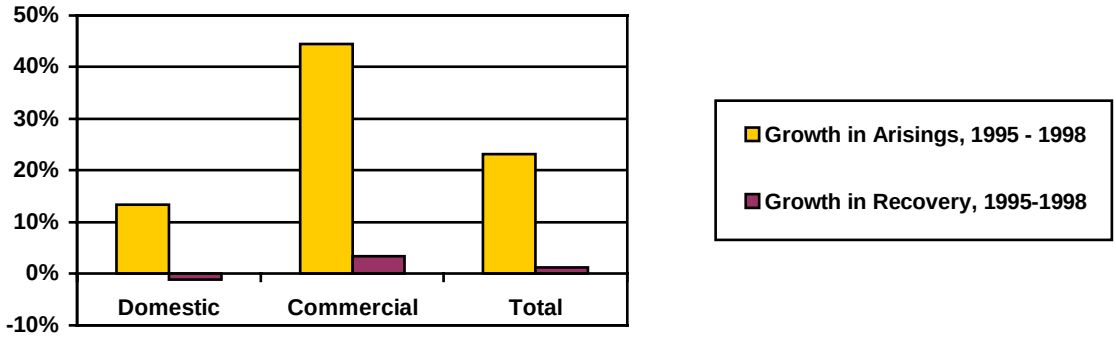

Figure 1: Growths in waste arisings and recovery levels from 1995 - 1998[1,2]

In Ireland, several schemes, programmes and instruments have been initiated to stimulate waste recovery rates. While it is true that some of these initiatives are at an early stage, it is apparent that the scale of the problem and the relative lack of progress thus far require further radical and effective actions both on the supply and demand sides of waste material reuse and recycling. On the supply side, the current levels of material recovery are low by international standards and require stimulation. However, one of the barriers to increased levels of municipal waste recovery is the lack of reliable, stable markets and outlets for these materials and the products that may be manufactured from them.

This study aimed to identify, assess and evaluate existing and potential outlets for materials that can be recovered (for reuse or recycling) from municipal waste, both in Ireland and abroad. The following waste streams were considered for study:

- Paper
- Cardboard
- Glass
- Plastics
- Ferrous Metals
- Non-ferrous metals (excluding aluminium)
- Aluminium
- Textiles
- Wood
- UBCs (used beverage cartons)

Another objective was to evaluate the potential of tools and instruments to stimulate such markets and the development of a strategic approach applying such tools for the

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[1] Environmental Protection Agency *National Waste Database Report for 1995,* 1996

[2] Environmental Protection Agency *National Waste Database Report, 1998,* 2000

creation of adequate, reliable and stable markets and other outlets for the recovery of useful materials from municipal waste. **The overall aim of the project was to aid a significant increase in municipal recycling rates in Ireland.**

2. Waste Arisings in Ireland

The solid waste arisings in Ireland are considerable. These arisings are also growing as the Irish population increases, as it becomes more affluent, and as industrial and commercial activities continue to increase.

The amounts of household, commercial and municipal solid waste (MSW) available for collection in Ireland are shown in the following table. From Table 1 it can be seen that almost 2 million tonnes of commercial and domestic waste were collected for disposal or recovery in year 1998[2]. Of this total, 1,163,216 tonnes (or 62.8%) came from the household or domestic sector and 689,234 tonnes (or 37.2%) came from the commercial sector.

	Household	Commercial	Total
Paper	226,723	415,429	642,151
Organics	376,207	84,662	460,869
Others	273,213	65,417	338,630
Plastic	134,100	66,303	200,403
Glass	75,626	41,132	116,757
Textiles	35,954	3,434	39,388
Ferrous	23,854	8,705	32,559
Aluminium	11,711	3,744	15,455
Other Metals	5,828	409	6,236
Total	1,163,216	689,234	1,852,450

Table 1: Waste arisings for collection from domestic and commercial sectors, 1998[2]

The characterisation of this waste shows that the main streams of consideration in this study are paper (including cardboard) at 35%, plastic at 11% and glass at 6% of the total amounts available.

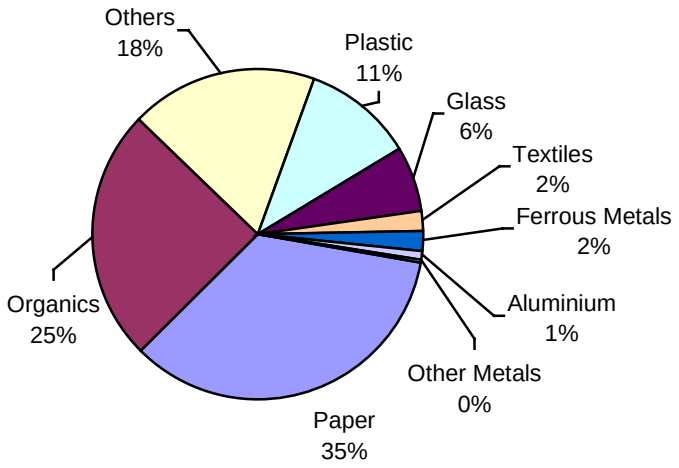

Figure 2: Composition of household and commercial waste streams, 1998[2]

3. Waste Recovery in Ireland

According to the *National Waste Database Report, 1998* amounts of materials recovered (in tonnes) and the rates of recovery are as follows:

	Household		Commercial		Total	
Material	**Amounts (tonnes)**	**Recovery Rate**	**Amounts (tonnes)**	**Recovery Rate**	**Amounts (tonnes)**	**Recovery Rate**
Glass	14,100	18.6%	21,900	53.2%	36,000	30.8%
Paper	7,150	3.2%	87,152	21%	94,302	14.7%
Ferrous Metals	1,062	4.5%	3,007	34.5%	4,069	12.5%
Textiles	3,247	9%	0	0%	3,247	8.2%
Aluminium	480	4.1%	251	6.7%	731	4.7%
Others	5,167	1.9%	*10,000*	15.3%	15,167	*4.5%*
Plastic	648	0.5%	6,828	10.3%	7,476	3.7%
Organics	5,665	1.5%	0	0.0%	*5,665*	1.2%
Other Metals	0	0.0%	28	6.7%	28	0.4%
Total	**37,518**	**3.2%**	**129,166**	**18.7%**	**166,684**	**9.0%**

Table 2: Household and commercial waste recovery in Ireland, 1998

Not only are these recovery levels far below national targets, especially for household waste, they are also much less than those being achieved by many of our EU partners.

The current level of waste arisings in Ireland has not been quantified in this study (and thus recovery rates cannot be estimated), but information was acquired regarding the amounts recovered by recyclers and contractors in the year 2000. While these figures may include waste from industrial as well as domestic and commercial sources and are therefore not comparable to EPA estimates for municipal waste recovered in 1998, Table 3 gives the amounts of material in tonnes that were reported recovered in the year 2000 from surveys conducted as part of this study.

Material	**Amounts Recovered year 2000**
Glass	40,500
Textiles	7,538
Ferrous metals	307,300
Paper	82,027
Cardboard	72,900
Plastics	15,000
Non-ferrous metals	29,500
Aluminium	16,890
Wood	50,000
Ubcs	N/a
Total:	**621,655**

Table 3: Amounts (in tonnes) of waste streams reported recovered in year 2000

4. Current Outlets

In order to assess and evaluate the existing outlets (both market and non-market) in Ireland and abroad, information was received from recyclers and collectors of MSW as to the outlets they are utilising.

The main outlets identified from the sources contacted in this survey are given in Table 4.

Materials	Main Outlets	Irl[3]	Abr.
Glass	Recycled for glass container manufacture	X	
	Recycled for glass fibre manufacture	X	
	Flat glass recycled for flat glass manufacture		X
Textiles	Reuse (as second hand clothes)	X	X
	Processed for rags		X
Ferrous Metals	Recycled in mills for ferrous manufacture	X[4]	X
	Small amounts in foundry	X	
Paper	Recycled in mills for paper manufacture		X
	Recycled for animal bedding	X	
	Composted	X	
Cardboard	Recycled in mills for cardboard manufacture	X	X
Plastic	Recycled to manufacture other plastic products	X	X
Non-ferrous metals	Recycled in foundries and smelters		X
	Lead smelter	X	
Aluminium	Recycled in smelters	X	X
Wood	Recycled for wood board manufacture	X	
	Mulching	X	
	Composting	X	
	Reuse	X	
	Energy recovery	X	
UBCs	None yet in use		

Table 4: Main outlets for recovered materials in Ireland, 2000

As can be seen from Table 4, all the material streams (except used beverage cartons) have outlets available to them. All the waste container glass and wood that is collected in Ireland is recycled in Ireland - none is exported. Apart from those two materials and cardboard, the majority of the other material streams are exported for processing abroad. Currently there is no Irish facility for recycling ferrous metal waste or non-ferrous metal waste (except lead). Likewise with paper, and only a small percentage

[3] "Irl" signifies recycled in Ireland (north and south), "abr" signifies recycled abroad

[4] No longer available since the closure of Irish Ispat (May, 2001)

of that recovered is recycled in Ireland. Plastics and aluminium wastes are processed successfully both in Ireland and abroad.

It is clear therefore that Ireland is dependent on foreign facilities for the processing of various fractions of waste. This is not so problematic in the case of metals, for which there seem to be stable outlets (although transport costs are higher for export). However, in the cases of paper and cardboard, the necessity to export is a major barrier to increased levels of recycling.

5. Potential New Outlets

In order to stimulate higher recovery levels of MSW, current outlets need to be exploited fully and new outlets need to be identified and developed. This is especially important because Ireland is an island nation with a relatively low population and relatively small markets. Ireland also has low environmental awareness levels, is dependent on exports, and has a very underdeveloped recycling infrastructure.

Potential outlets were examined for each waste stream as part of this research. In particular, markets that are already being utilised successfully by other countries with higher recovery levels than Ireland were studied vis-à-vis their applicability here.

Potential new outlets for each material, where required, are listed in Table 5. These are described in more detail in the report *A Strategy for Developing Recycling Markets in Ireland* and the Fact Sheets.

Materials	**Potential New Outlets**
Glass	Industrial abrasives; glass wool products; construction aggregate; glassphalt; filtration media; landscaping; Portland Cement; epoxy binders; ceramic glazes.
Textiles	Production of yarn and fleece; production of synthetic materials; textile hardboards; carpet products.
Ferrous Metals	
Paper	Moulded fibre packaging; insulation; building board and furniture; paper mill in Ireland.
Cardboard	Higher levels of reuse; 2nd cardboard mill in Ireland.
Plastic	Several in road safety, home gardening, horticulture, building, domestic, entertainment, agriculture, furniture, marine engineering, plumbing and drainage, education, sports, waste industry, transport, office etc.
Non-Ferrous Metals	
Aluminium	
Wood	Wood-fibre-plastic products; inorganic bonded wood composites; pulp and paper manufacture; others.
UBCs	Paper based products, new cartons, thermoformed products and building material, heat recovery.

Table 5: Summary of potential new outlets for waste streams

It is undoubtedly the case that the requirement for new outlets is not as pressing for some materials as for others. For example, the current glass manufacturing industry seems to have sufficient extra capacity to accept short to medium term increases in volumes of good quality cullet (with some green glass problems). And the exporting of metals does not seem a major deterrent to merchants, as long as the markets there are relatively stable. However, there is a pressing requirement for new stable paper and cardboard markets, as their recovery levels will greatly increase due to packaging and landfilling regulations. There is a wide range of potential markets for recycled plastic products, but the economics and infrastructure of recovery are a problem as is the domestic, commercial and public agency reluctance to purchase such products.

In all cases, instruments and tools are required to boost recovery levels and to support potential new outlets, especially Irish outlets.

6. Barriers to Recovery

As the low levels of recycling would indicate, there are many barriers to the collection, reuse and recycling of waste materials in Ireland today. Some of these are material specific, such as the diversity of plastic waste streams. Others, such as a lack of environmental awareness, affect the recovery of all waste streams.

The following 14 barriers hinder the increased collection, reuse and recycling of waste materials in Ireland:

Barriers to Recycling in Ireland		
No culture of recycling	Small island, dispersed population	No paper production
Cheap, easy disposal	Low environmental awareness	Infrastructural deficiencies
Lack of research	Lack of information provision	Lack of standards
Technical barriers	Lack of green public procurement	Lack of economic instruments
Lack of legislation, lack of enforcement	Lack of extended producer responsibility	

Table 6: General barriers to recycling in Ireland

The effect of the general barriers is further developed in Table 7. As well as these 14 general barriers, each material stream also has specific barriers preventing its increased recovery and recycling. These specific barriers to individual waste streams are discussed in more detail in the Fact Sheets for each material and are described briefly in the report: *A Strategy for Developing Recycling Markets in Ireland*. They are listed in Table 8.

Since so many barriers exist, both generally and specific to material streams, it is clear that a series of tools and instruments are required to overcome them.

Material / **Barrier**	No culture of recycling	Small island	No paper production capacity	Cheap and easy disposal	Low awareness levels	Infrastructural deficiencies	Lack of research	Lack of information	Lack of standards	Technical barriers	Lack of Green procurement	Lack of economic instruments	Legislation problems	Lack of extended producer responsibility	* Total
Glass	**	*		**	***	***	*	*		*	*	**	*	**	20
Textiles	*	*		**	**	**	*	*			*	*	*	*	14
Ferrous Metals	*	*		*	**	**	*	*	*	*	*	**	*	**	17
Paper	***	***	***	**	***	***	**	*	**	**	***	***	**	***	35
Cardboard	***	***		**	***	***	*	*	*	**	***	**	**	**	28
Plastics	***	***		***	***	***	**	*	**	**	***	**	**	***	32
Non-ferrous metals	*	*		*	**	**	*	*	*	*	*	*	*	**	16
Aluminium	**	**		**	***	***	*	*	*	*	*	**	*	**	22
Wood	**	*	*	***	**	**	*	*	*	*	**	*	***	*	22
Ubcs	*	*	*	**	*	**	*	*	*		*	*	*	*	15

Table 7: General barriers to recovery and their effect[5]

[5] * indicates a minor barrier; ** indicated a moderate barrier, *** indicated a major barrier

Material	**Specific Barriers**
Glass	Green glass market; contaminants; mixed colours; insufficient bring sites; awareness levels; insufficient markets.
Textiles	Awareness levels; personal nature of textiles; infrastructural deficiencies; throwaway society; lack of research.
Ferrous Metals	Insufficient collection systems and bring sites; economic barriers; lack of collection facilities for WEEE; economic problems for WEEE collection; price fluctuations.
Paper	No paper production in Ireland; price fluctuations; false public perceptions of recycled paper; lack of research.
Cardboard	Insufficient cardboard production in Ireland; price fluctuations.
Plastics	Many plastics on the market; non suitable for food packaging; large fraction of mixed plastics; energy value of plastics recovery; contamination; limited potential demand; low virgin plastics prices.
Non-ferrous metals	Lack of WEEE collection facilities; economic problems with WEEE recovery; low awareness: hazardous materials.
Aluminium	Lack of collection systems and bring sites, collection facilities; lack of support instruments; lack of awareness; waste characterisation of aluminium waste stream.
Wood	Prevalence of contaminated wood; lack of wood waste segregation; lack of legislation implementation.
UBCs	Little waste segregation; contamination; no paper mill in Ireland; nature of composites (different materials); poor infrastructure.

Table 8: Specific barriers to the recovery of individual waste streams

7. Strategy for Waste Reuse and Recycling

A strategic approach is required in order to overcome the many barriers identified. All the required elements for a major increase in the recovery and recycling of waste must be put into place and the forces and drivers to achieve this must be managed effectively and proactively. The various stakeholders must be marshalled properly so that each can play their expected role.

It is also imperative that these driving forces are put into place in a considered and strategic manner. Specific responsibilities must be identified and the relevant target groups must be assigned these responsibilities, so that a maximum effect is ensured. The implementation of such a strategy also requires that all the measures are mutually supportive.

The aim of this strategy is to reduce the waste we are creating and then to convert that waste into useful raw materials that can be used beneficially in the manufacture of viable products. By a series of actions, delivering a range of tools to the stakeholders involved (all the population), this strategy will reduce our unnecessary consumption of finite resources as well as diminishing our dependency on landfill and the concomitant pollution that it can cause.

There are three levels to this required strategy. At the widest level is the strategy itself to create a sustainable culture of recycling in Ireland. There are five main components or building blocks upon which any recycling framework is based: **awareness, information, economic and legislative conditions and infrastructure**. Instruments are required to develop each of these components. However in order to bring about and deliver these instruments, several specific actions are required by the main stakeholder groups. The carrying out of these actions delivers the tools and instruments required to put into place the framework for recycling. The delivery of the actions and development of the instruments is overseen and managed effectively in the implementation of the strategy for change.

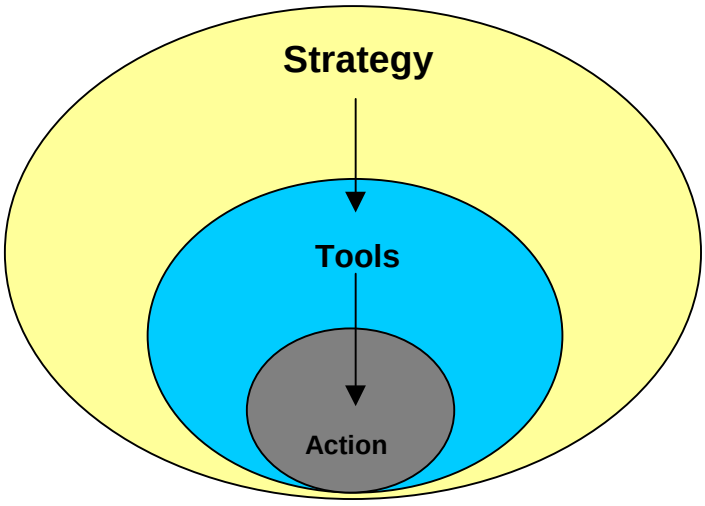

Figure 3: Three levels of strategy for change

The four stages of the recycling chain are supply, collection, processing and demand and all of these must be targeted by the relevant tools and instruments. It is not enough to simply ensure that there are sufficient amounts of segregated waste available for recycling. The systems of collection must be in place so that these wastes can be cost-effectively gathered in the appropriate form using best practice by the various agents required. The infrastructure for collection must be developed, but so must the facilities for recycling and reprocessing. However, this is still not enough. It is also necessary to increase the demand for the recyclate and the products manufactured therefrom. And, once these products have been used, their 'waste' can be entered into the chain for another cycle.

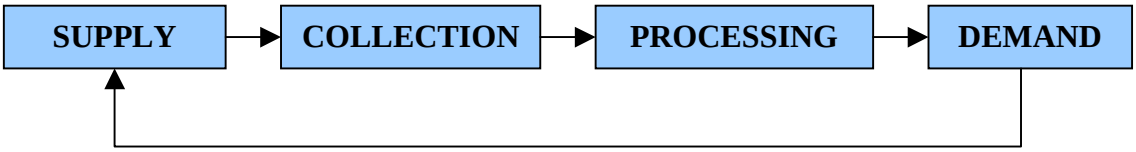

Figure 4: Four stages of the recycling chain

Since different stakeholder groups have different responsibilities vis-à-vis the different elements of the recycling chain, the different instruments available must be applied in a suitable manner for each. Some stakeholders have roles in the development and implementation of tools and instruments. Others will be the main targets of these drivers so that they can behave more responsibly with respect to the raw materials they consume and the waste they create. Figure 5 shows the main network of actors required to develop a sustainable waste management strategy in Ireland.

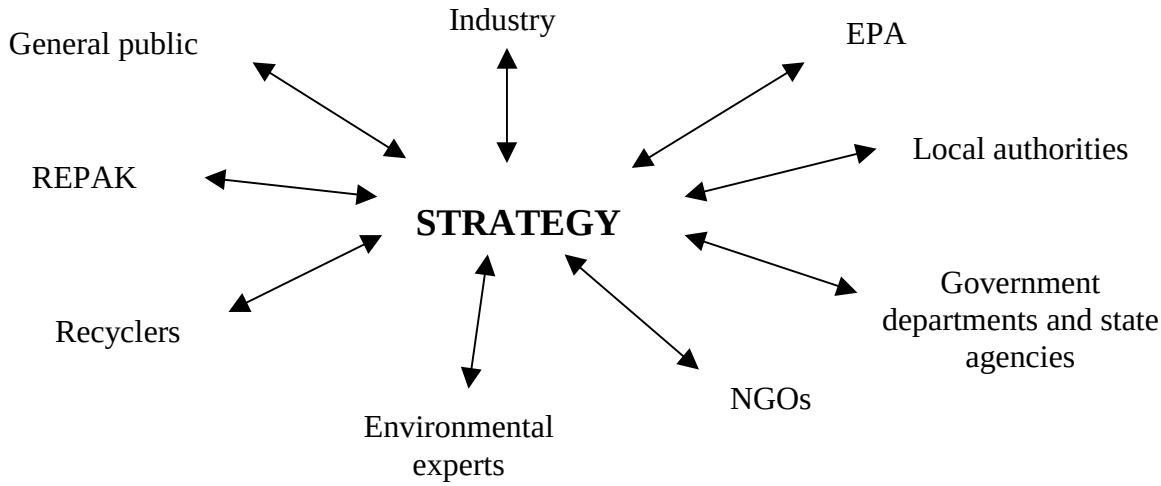

Figure 5: Network of actors to develop sustainable waste management

Central to any strategy is the question of who will have the responsibility to implement it. In order to optimise the co-ordination and to ensure a coherent implementation of the wide range of activities and tools suggested herein, **it is recommended that responsibility is allocated and that sufficient resources are made available.** Also, since so many instrument developers are required to act and so many groups targeted, these must be brought together in an effective manner to

ensure maximum co-operation. Above all, allocation of responsibility and provision of adequate resources are required to drive forward the actions required to create the conditions under which recycling can prosper.

The strategy and responsible agents should be action driven - it should not merely involve discussion groups alone. It should set specific targets and goals and develop plans to achieve them. It should be the central hub of the network of actors and stakeholders which are required to create conditions for sustainable waste management in Ireland.

Several formats for developing responsibility are possible. Whichever format is chosen, it is important to realise that a committee or other discussion forum alone will not suffice. **Real power, permanent staffing, and an action orientation are required**.

8. Potentially Viable Tools and Instruments

As stated previously, the strategy will have five main components, and a mutually supportive set of tools will be applied to drive each component. The tools and instruments that have been applied elsewhere and that should be considered in Ireland for each of these components are shown in Table 9.

To support the strategy from the beginning and to ensure that it takes the correct path, further research is also required. This is needed for every component of the strategy, to learn more about our wastes, how best to increase awareness, what information is required by each actor, what economic instruments are best to stimulate the various streams, how best to develop the infrastructure required and what type of legislation is also necessary. Thus, in all, 17 main instruments are necessary in order to develop the framework within which the level of recycling in Ireland can be raised to the required level.

Strategy Components	**Instruments (including Research at all Levels)**
Awareness	Awareness raising programme Eco labels Participatory approach
Information	Standards Design for the Environment Information provision Market Development Programme
Economic	Economic instruments Green procurement Pan-Irish approach Extended producer responsibility Public private partnerships
Infrastructure	Infrastructural development Paper mill
Legislation	Legislation implementation Landfill bans

Table 9: Instruments required for each component

Table 10 on the following page shows a matrix linking the main barriers identified in Table 6 and some potential tools and instruments that can be used to overcome them.

Barrier / **Instrument**	Awareness Raising Programme	Eco Labels	Participatory Approach	Standards	Design for the Environment	Information Provision	Market Development Programme	Economic Instruments	Green Public Procurement	Pan-Irish Approach	Extended Producer Responsibility	Public Private Partnerships	Infrastructural Development	Paper Mill	Legislation Implementation	Landfill Bans	Research
No culture of recycling	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Small Island	*						*		*				*				*
No paper production							*	*	*		*		*	*			*
Cheap and easy disposal								*							*	*	*
Low awareness levels	*	*	*		*	*	*		*			*	*				*
Infrastructural deficiencies								*		*		*	*	*			*
Lack of research							*	*									*
Lack of information	*	*	*	*	*	*	*						*	*	*	*	*
Lack of standards				*			*										*
Lack of green procurement	*	*	*	*	*	*	*	*	*								*
Lack of economic instruments								*									*
Legislative problems															*		*
Lack of extended producer responsibility					*						*						*

Table 10: Barriers to recycling in Ireland and potential tools to overcome them

9. Implementation of Instruments and Actions

In any strategy all concerned must also be clear of their assigned roles. The role of the instrument developers is especially important since these organisations will implement the instruments by a series of actions. The main stakeholder groups that will be responsible for implementing the instruments of the strategy are as follows:

- **National government**[6]: this includes the Department of Environment and Local Government in particular, but also other relevant departments, such as Finance, Education and Science, and Enterprise Trade and Employment. It also includes state agencies such as Enterprise Ireland, the National Standards Authority of Ireland, Forfás etc.
- **Local government**: this includes county councils, town and city corporations, urban district corporations.
- **Industry**: this includes all elements of business and commerce including all industrial sectors, agriculture, service sectors, tourism, finance, commerce, retail, transport etc.
- **Consumers**[7]: this includes all consumers such as domestic, industrial, public agencies etc.
- **Recyclers**: this includes all business elements involved in waste management, collection, reprocessing, reusing and recycling.
- **Waste Producers**: this includes all waste producers such as domestic, industrial, public agencies etc.

National and local governments have main roles in the promotion and development of these instruments. Industry also has a major role to play in the development of awareness raising, greening purchasing programmes, research, public private partnerships, design for the environment, etc.

Other stakeholder groups with an important role in the development of a viable recycling industry in Ireland are:

- **EPA**: the EPA will obviously play a central role in the licensing and regulating of waste issues, the development of data, the co-ordination of research, the development of a strategy etc.
- **NGOs**: NGOs will continue to play an important role regarding waste recycling, as representatives of the general public, as independent environmental protectors etc.
- **REPAK**: REPAK is the only current government approved body to implement producer responsibility with respect to packaging waste in Ireland.

[6] Note: in the case of green purchasing, awareness raising, research etc. national and local government also includes all public agencies including schools, health boards, hospitals, colleges, universities, semi-state companies etc.

[7] While everybody consumes material in their home, job and at leisure these instruments focus on the consumption activity of these people. Similarly everybody produces waste, but these instruments focus on the activity of waste production.

- **Environmental Experts**: independent environmental experts will continue to carry out research and develop the required information to drive recycling, develop new markets etc.
- **General Public**: the general public must play its part, accepting responsibility for its waste, making itself aware of the issues, increasing its waste recovery and purchasing recycled and more environmentally friendly products.

The target groups for these instruments are mainly those who consume products and produce waste (everyone, including domestic, industrial, commercial, public agencies), but some instruments are specifically geared towards product consumption (e.g. green procurement programmes, eco-labels) and other towards waste production (e.g. landfill bans). Other instruments focus on activities specific to industrial waste production (e.g. extended producer responsibility), and in that case the target is industry.

Another important target group is recyclers. These are the people who drive the recycling activity from a business perspective, and this sector is a vital stakeholder if recovery levels are to increase. In general they must be supported so that they can develop viable businesses, in collection, reprocessing or selling recycled products – often in public private partnerships. Economic instruments, especially grant aid, a pan-Irish approach, standards, research etc. will help these companies to develop in the long-term.

While general tools and policy instruments are all very well, they must be developed by the implementation of a range of specific and concrete actions. These actions must be focused, responsibilities must be clear, objectives must be attainable and explicit.

However, these actions must be considered in the context of an overall national strategy for waste management that is preventive based and built upon the principles of sustainable development.

9.1 Recommended Actions

Several actions are recommended in order to implement the required tools.

These actions are necessary to support the main components or building blocks upon which any framework for recycling will be based, viz.

- Awareness
- Information
- Economics
- Infrastructure
- Legislation

Specific actions required to develop each of these components are listed in the Tables 11 – 15 on the following pages:

AWARENESS-BASED ACTIONS	
Responsibility	**Action**
DOELG	Implement a wide-ranging 10 year awareness campaign on recycling, expanding the *It's* elements outlined in Section 8 of report: *A Strategy for Developing Recycling Markets in*
Local authorities	Implement effective and long term local awareness raising campaigns, with elements ou *Developing Recycling Markets in Ireland.*
Local authorities	Employ adequate number of environmental education/training offers to significantly inc each region.
Industry	Industry to use eco-label systems on their products and packaging.
DOELG/DES	Include environmental issues, including waste, in curricula of primary, secondary and te
DOELG	Greater public participation approach when drafting new policies, strategies, plans etc.
DOELG	Greater openness and transparency in decision making relating to waste and recycling.
All public agencies	Training of all relevant public agency staff of waste reduction and recovery issues.
DOELG	Better communication of national policies, plans, strategies etc. to all stakeholders.
Local authorities	All relevant local authority employees to be trained in waste prevention and recovery iss
Local authorities	Greater public participation approach when drafting new policies, strategies, plans etc.
Local authorities	Greater openness and transparency in decision making relating to waste and recycling.
Local authorities	Better communication of local policies, plans, strategies etc. to all stakeholders.
Industry	All employees to be trained on waste prevention and recovery issues.
Industry	Better stakeholder approach when drafting new policies, strategies, plans etc.
Recyclers	Greater public participation approach when planning better infrastructure, new facilities
Recyclers	Better communication to public of plans, new facilities, operations etc.
REPAK	Continue to improve communications with stakeholders, including public on recycling is
REPAK	Increase openness, transparency and participation levels in the development of initiative
NGOs	Increase involvement in waste plans and projects with local authorities and government.
NGOs	Increase public awareness levels, especially at local level of issues relating to waste reco
General Public	Inform themselves on waste related issues and best options.

Table 11: Awareness based actions

INFORMATION-BASED ACTIONS	
Responsibility	**Action**
DOELG and other stakeholders	Implement a Market Development Programme to acquire and disseminate inform streams; the programme will also disseminate grants and financial support for ma programme will work with recyclers and others to develop markets; the programı standards and quality criteria relating to recyclates and products from recyclates; expertise and funding required.
DOELG and other stakeholders	Development of service to acquire, store and disseminate information relating to
Local authorities	Support national programme on market development and promote the programm
Industry	Development of standards and quality criteria relating to recyclates as a raw mate
Industry	Greater importance placed on environment in design and production decisions.
Industry	Increase level of waste related research to reduce industrial waste production and
Recyclers	Development of standards and quality criteria to facilitate the use of recyclates ar circumstances.
Recyclers	Utilise national programme for market development.
EPA/DOELG	Continue to develop adequate data regarding waste arisings, recovery, disposal et
EPA/DOELG	Co-ordinate increased levels of appropriate research regarding waste prevention a
Local authorities	Increase level of waste related research to investigate awareness, information, ec legislative requirements.
REPAK	Facilitate training programmes for all member companies to increase waste preve
REPAK	Increase market development focus and co-fund market related projects from res
Local Authorities	Dissemination of information to potential recyclers or users of recycled materials

Table 12: Information based actions

	ECONOMIC-BASED ACTIONS
Responsibility	**Action**
DOELG	In conjunction with the other key stakeholders, secure the implementation of proc within the respective sectors for the various streams of waste.
DOELG	In the absence of producer responsibility initiatives being implemented within th mechanisms for the introduction of product charges on non packaging waste gen should be a priority target for newspapers, office paper, etc.
DOELG	Investigate the effects of extending the responsibility obligations in the packagin threshold for obligated waste packaging producers (as Major Producers) to 10 to
DOELG	Review the conditions established for REPAK to operate as an Approved Body i the Minister to include for specified numerical targets for the recycling and recov 2002 to 2005.
DOELG/DF	Investigate the removal of VAT on recyclates and the reduction of VAT on recyc
Local Authorities	Substantially increase landfill charges by end of year 2002.
DOELG	Implement grant aid schemes for recycling projects, infrastructure, research etc.
DOELG and all agencies	DOELG to provide guidance documents to all government and public agencies w implement detailed green procurement policies.
DOELG and all agencies	DOELG to provide guidance documents to all government and public agencies w significantly increase their waste recovery levels.
Local Authorities	Implement weight/volume related charges (pay-as-you-throw) schemes, so that la more (these charges must not be regressive).
Local Authorities	All local authorities to apply the guidance issued by central government and to en departments develop and implement a green procurement policy.
Local Authorities	All local authorities to apply the guidance issued by central government and to en departments recover their waste where appropriate.

Table 13: Economic based actions

ECONOMIC-BASED ACTIONS cont.	
Responsibility	**Action**
Local Authorities	All local authorities to avail of public private partnerships for waste segregation, the development of infrastructure where appropriate.
Industry	Reduce level of green glass usage for container glass.
Industry	Accept responsibility for the production of manufacturing waste and the waste ar implement producer responsibility initiatives designed to reduce the level of wast measures to ensure that waste which is generated from products is collected for r new Irish recycling facilities, such as a paper mill or mills.
Industry	Develop green procurement policies within industry, in particular to support new paper mill or mills.
DOELG	Carry out discussions with Environment officials from Northern Ireland with a vi infrastructural development.
Recyclers	Develop public private partnerships with local authorities.

Table 13 cont.: Economic based actions cont.

INFRASTRUCTURAL SUPPORT-BASED ACTIONS	
Responsibility	**Action**
DOELG	Significantly increase direct funding and support of local authorities for infrastru collection and recycling facilities.
DOELG/DETE/ Enterprise Ireland	Undertake a detailed feasibility study, with particular reference to the potential fo initiative, in relation to the possible development of a paper mill in Ireland in par authorities, recyclers and other stakeholders.
Local Authorities	Implement kerbside collection schemes for dry recyclables in urban areas.
Local Authorities	Develop bring site numbers to a level of 1 bring site per 500 persons.
Local Authorities	Extend materials collected in bring sites, to include: textiles, plastics, food cans,
REPAK	Develop national infrastructure by co-funding with local and national governmen
NGOs	Actively support improvements in infrastructure from bring sites etc.

Table 14: Infrastructural support based actions

LEGISLATIVE-BASED ACTIONS	
Responsibility	**Action**
DOELG	Implement a national landfill ban on all materials for which adequate bring site o in place.
DOELG	Streamline planning regulations to facilitate the early development of substantial
Local Authorities	Implement a local landfill ban for all material streams for which adequate bring s place.
Local Authorities	Ensure total enforcement of waste packaging regulations within each region.
Local Authorities	Ensure that only legal waste disposal occurs within each region.

Table 15: Legislative based actions

9.2 Recommended Actions for Main Stakeholder Groups

As part of this strategy it is also necessary to allocate specific responsibilities for implementation of the various elements of the strategy, with the provision of required authority/powers and resources. It is important that each relevant stakeholder group should be involved in any strategy, both in the development and implementation stages. Every stakeholder group has a role to play and should act accordingly. Specific to each stakeholder group the following actions should be seriously considered for implementation:

National Government

The following actions should be seriously considered for implementation by the relevant elements of national government:

1. Enunciate a national strategy for sustainable waste management.
2. Allocate specific responsibility for implementation of the various elements of the strategy, with the provision of required authority/powers and resources.
3. Implement a wide-ranging awareness campaign on recycling, expanding and building upon the *It's Easy to Make a Difference* scheme, as described in

Section 8 of the report *A Strategy for Developing Recycling Markets in Ireland.*

4. Implement a Market Development Programme to acquire and disseminate information regarding markets for waste streams; the programme will also disseminate grants and financial supports for market development issues; the programme will work with recyclers and other to develop markets; the programme will promote standards and quality criteria relating to recyclates and products from recyclates; adequate resources, expertise and funding required to be provided.
5. Develop a service to acquire, store and disseminate information relating to waste issues.
6. In conjunction with the other key stakeholders, secure the implementation of producer responsibility initiatives within the respective sectors for the various streams of waste.
7. In the absence of producer responsibility initiatives being implemented within the various sectors, investigate potential mechanisms for the introduction of product charges on non packaging waste generating products. Product charges should be a priority target for newspapers, office paper, etc.
8. Review the conditions established for REPAK to operate as an Approved Body in the certification of the scheme by the Minister to include for specified numerical targets for the recycling and recovery of packaging waste in the period 2002 to 2005.
9. Investigate the effects of extending the responsibility obligations in the packaging sector by a reduction of the threshold for obligated waste packaging producers (as Major Producers) to 10 tonnes per annum.
10. Investigate the removal of VAT on recyclates and the reduction of VAT on recycled products.
11. Increase landfill levy by a substantial amount in year 2003.
12. Implement grant aid and financial assistance schemes in support of worthwhile recycling projects, infrastructure, research etc.
13. DOELG to provide guidance documents to all government and public agencies who would then develop and implement detailed green procurement policies.
14. DOELG to provide guidance documents to all government and public agencies who would then develop plans to significantly increase their waste recovery levels.
15. Carry out discussions with Environment officials from Northern Ireland with a view to developing joint projects and infrastructural development.
16. Significantly increase direct funding and support of local authorities for infrastructural development for segregation, collection and recycling facilities.
17. Undertake a detailed feasibility study, with particular reference to the potential for a producer responsibility initiative, in relation to the possible development of a paper mill in Ireland in partnership with industry, local authorities, recyclers and other stakeholders.
18. Implement a national landfill ban on all materials for which adequate bring sites or collection facilities are nationally in place.
19. Streamline planning regulations to facilitate the early development of substantial additional bring sites.
20. Increase level of waste related research to investigate awareness, information, economic, infrastructural, and legislative requirements.

21. Include environmental issues, including waste, in curricula of primary, secondary and tertiary educational systems.
22. Ensure greater public participation approach when drafting new policies, strategies, plans etc.
23. Ensure greater openness and transparency in decision making relating to waste and recycling.
24. Provide better communication of national policies, plans, strategies etc. to all stakeholders.
25. Implement training of all relevant public agency staff of waste reduction and recovery issues.

Local Government

The following actions should be seriously considered for implementation by local authorities, within their areas:

1. Implement effective and long term local awareness raising campaigns, with elements outlined in Section 8 of the report *A Strategy for Developing Recycling Markets in Ireland.*
2. Employ adequate number of environmental education/training officers to significantly increase environmental awareness levels in each region.
3. Support national programme on market development and promote the programme at a local level.
4. Substantially increase landfill charges by end of year 2002.
5. Implement weight/volume related charges (pay-as-you-throw) schemes, so that larger domestic waste producers pay more (these charges must not be regressive).
6. All local authorities to apply the guidance issued by central government and to ensure that all its agencies and departments develop and implement a green procurement policy.
7. All local authorities to apply the guidance issued by central government and to ensure that all its agencies and departments recover their waste.
8. All local authorities to avail of public private partnerships for waste segregation, collection, and recycling as well as the development of infrastructure.
9. Local authorities to implement kerbside collection schemes for dry recyclables in urban areas.
10. Local authorities to develop bring site numbers to a level of 1 bring site per 500 persons.
11. Local authorities to extend materials collected in bring sites, to include: textiles, plastics, food cans, ubcs.
12. Implement a local landfill ban for all material streams for which adequate bring sites or collection facilities are in place.
13. Ensure total enforcement of waste packaging regulations within each region.
14. Ensure that only authorised waste disposal occurs within each region.

15. Increase level of waste related research to investigate local awareness, information, economic, infrastructural, and legislative requirements.
16. Greater public participation approach when drafting new policies, strategies, plans etc.
17. Greater openness and transparency in decision making relating to waste and recycling.
18. Better communication of local policies, plans, strategies etc. to all stakeholders.
19. Training of all relevant local authority staff of waste reduction and recovery issues.
20. Promotion of standards and quality criteria relating to recyclates and products from recyclates.
21. Dissemination of information to potential recyclers or users of recycled materials.

Industry

The following actions should be seriously considered for implementation by industry in order to improve its performance in all sectors, vis-à-vis waste production, recovery, reuse, recycling and the usage of recyclates and recycled products in industry:

1. Develop green procurement policies within industry, in particular to support new Irish recycling facilities, such as a paper mill or mills.
2. Accept responsibility for the production of manufacturing waste and the waste arising from products. Accordingly, implement producer responsibility initiatives designed to reduce the level of waste production and put into place measures to ensure that waste which is generated from products is collected for recycling, in particular to support new Irish recycling facilities, such as a paper mill or mills.
3. All employees to be trained on waste prevention and recovery issues.
4. Development of standards and quality criteria relating to recyclates as a raw material suitable for usage in industry.
5. Greater importance placed on environment in design and production decisions.
6. Reduce level of green glass usage for container glass.
7. Industry to use eco-label systems on their products and packaging.
8. Increase level of waste related research to reduce industrial waste production and increase recovery.
9. Better stakeholder approach when drafting new policies, strategies, plans etc.

Recyclers

The following actions should be seriously considered for implementation by recyclers to support the development of that industry and to ensure a significant trade in recyclates and recycled products in Ireland:

1. Develop public private partnerships with local authorities.
2. Utilise national programme for market development.
3. Development of standards and quality criteria to facilitate the use of recyclates and recycled products in appropriate circumstances.
4. Better communication to public of plans, new facilities, operations etc.
5. Greater public participation approach when planning better infrastructure, new facilities etc.

Environmental Protection Agency (EPA)

The following actions should be seriously considered for implementation by the EPA to support the development of the national strategy:

1. Continue to develop adequate data regarding waste arisings, recovery, disposal etc.
2. Co-ordinate increased levels of appropriate research regarding waste prevention and recovery.
3. Play a major role in the development and implementation of national strategy on sustainable waste management and the coordination of waste recovery strategy.

REPAK

The following actions should be seriously considered for implementation by REPAK to improve the recovery levels of packaging waste in Ireland and the development of viable markets for recyclates and recycled products:

1. Develop national infrastructure by co-funding with local and national government.
2. Maintain and improve the level of recovery of packaging waste from commercial/industrial sources while steadily increasing the focus on domestic packaging waste recovery.
3. Facilitate training programmes for all member companies to increase waste prevention and recovery.
4. Increase market development focus and co-fund market related projects from research, pilot schemes etc.
5. Continue to improve communications with stakeholders, including public on recycling issues.
6. Increase openness, transparency and participation levels in the development of initiatives, plans, and fees.

Environmental Experts

There is a range of environmental experts in Ireland. These are part of industry, recycling organisations, private consultancies, NGOs, local or national government, the general public, the EPA, academic organisations, research agencies etc. These experts have a role to play in the strategy, carrying out the following actions:

1. Carry out prevention and recovery related research and disseminate results.

2. Implement pilot and other schemes regarding recyclate usages.
3. Co-operate with other stakeholder to increase knowledge base.

Non-governmental Organisations (NGOs)

The following actions should be seriously considered for implementation by NGOs to support the improved recovery, reuse and recycling levels in Ireland:

1. Actively support improvements in the waste recycling infrastructure including improved collection and reprocessing facilities.
2. Increase involvement in waste plans and projects with local authorities and government.
3. Play an active role in the development and implementation of the national strategy.
4. Increase public awareness levels, especially at local level of issues relating to waste recovery and recycling.

The General Public

Everyone must play their part and accept responsibility for their actions. The following actions should be seriously considered for implementation by the general public:

1. Buy recycled goods and goods with less packaging and recycled packaging.
2. Segregate waste and make it available for recovery using collection schemes, brings sites, etc.
3. Inform themselves on waste related issues and best options and the best practical options to be taken by them at a local level.