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DEPARTMENT OF THE ENVIRONMENT, HERITAGE
AND LOCAL GOVERNMENT



National Strategy on

Biodegradable Waste

DRAFT STRATEGY REPORT

April 2004



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1 INTRODUCTION

1.1 STRATEGY AIMS

Improving our waste management system is a key challenge that is currently engaging Ireland's citizens and government. A primary goal in accordance with the EU Landfill Directive is to reduce our dependence on landfill in favour of more environmentally sound alternatives.

This document outlines the Government policy for the diversion of biodegradable municipal waste from landfill, building upon the key objectives in policy documents "Changing Our Ways" (1998) and "Delivering Change- Preventing and Recycling Waste" (2002).

1.2 WHAT IS 'BIODEGRADABLE' WASTE ?

Approximately two-thirds of the waste produced by homes and businesses comprises 'organic' or natural materials. These materials will break down over time ('biodegrade') by natural processes.



Some typical biodegradable materials

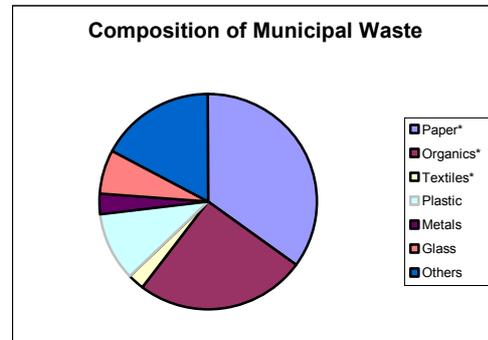
This Strategy focuses primarily on Municipal Waste, which is produced largely by households and commerce. The principal 'biodegradable' components of municipal waste are paper and cardboard, food wastes and garden waste. Some 65% of municipal waste is biodegradable.

1.3 REQUIREMENT TO DIVERT FROM LANDFILL

In 1999, the European Commission adopted a Directive dealing with the landfilling of waste, which is known as the 'Landfill Directive' (1999/31/EC). In addition to setting demanding new standards for all landfills in order to improve environmental

protection, the Directive imposes a gradual phasing-out of certain materials from landfills. This includes biodegradable waste.

Each Member State is obliged to take measures to implement the Landfill Directive targets. In addition a National Strategy must be completed and submitted.



*denotes biodegradable

1.4 BENEFITS OF RECYCLING AND RECOVERY

Landfilling of biodegradable waste creates negative impacts on the environment, such as:

- Release of landfill gas, a powerful global-warming gas, which is also odorous
- Generation of leachate, which must be collected and treated
- Slow degradation – management of landfill gas and leachate must continue for many years after a landfill is closed.

A more sustainable alternative is to treat the biodegradable waste as a resource which can substitute for primary raw materials and thereby reduce our consumption of natural resources. A simple example is recycling food and garden waste into compost, which can be used to grow new crops.

Therefore there is significant benefit from channelling biodegradable waste away from landfill towards recycling and recovery.

1.5 WASTE MANAGEMENT POLICY FRAMEWORK

Ireland's waste management policy framework has been established through a combination of Government policy statements and local authority waste management plans. These form the basis for delivering a new national integrated and sustainable waste management system over the coming decade.

Changing Our Ways (1998)

This Policy Statement preceded the development of the Regional Waste Management Plans, setting a primary objective of reducing Ireland's dependence on landfill in favour of an integrated system of recycling and recovery infrastructure. "Changing Our Ways" provided national targets for municipal waste recycling and biological treatment, and set the framework for regional waste management planning.

Key targets of 'Changing Our Ways' for 2013

Diversion of 50% of overall household waste away from landfill

A minimum 65% reduction in Biodegradable Municipal Waste (BMW) sent to landfill

Developing biological treatment capacity of up to 300,000 tpa

Recycling of 35% of municipal waste

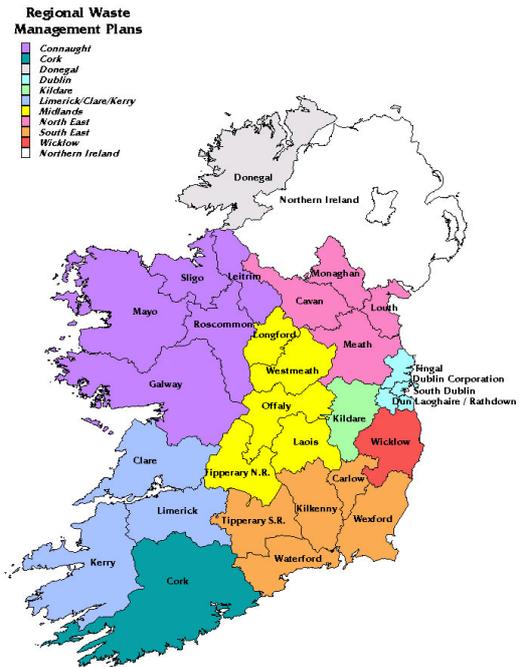
Rationalisation of municipal waste landfills to a network of 20 state-of-the art sites

Reduction of methane emissions from landfill by 80%

Regional Waste Management Plans

Over the period 1998-2002, waste management plans were drawn up by all local authorities. Seven regional groupings emerged (Dublin, North-East, Midlands, Connaught, Limerick/Clare/ Kerry, Cork, and the South East), with three counties – Kildare, Wicklow and Donegal – preparing Plans independently.

The Plans include mechanisms to support waste minimisation and prevention, and the provision of new systems for collection, recycling and recovery of waste. They also seek to ensure ongoing access to landfill capacity. Each region has set its own targets for improved performance to satisfy the National Targets of "Changing our Ways".

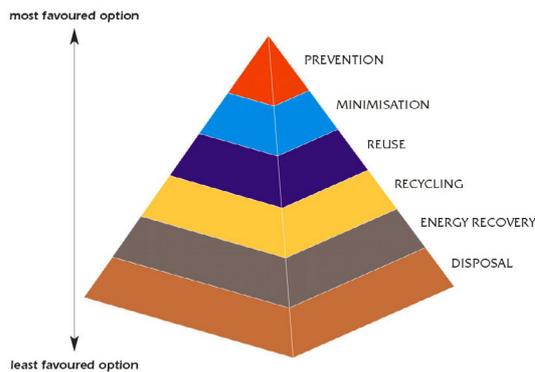


Delivering Change – Preventing and Recycling Waste (2002).

This Government Policy Statement focused on measures to reduce waste by involving individuals, local authorities, and also the businesses and industries that create products. A number of new national initiatives were adopted to accelerate the pace of change in society, including:

- Establishment of a National Waste Management Board to co-ordinate, monitor, review and advise on all aspects of waste management policy
- Establishment of a National Waste Prevention Programme, to be driven by a new Core Prevention Team within the EPA
- Establishment of a Recycling Consultative Forum and Market Development Group to lead the expansion of markets for waste-derived materials

Already progress has been made in developing industry-led initiatives, which are designed to deliver specific environmental targets and objectives through the implementation of effective, workable and least-cost arrangements by industry and the Government has begun to introduce progressive bans on the landfilling of certain materials. A further objective is to develop the markets available for materials that are recovered from the waste stream here in Ireland.



Irish Policy and Waste Management Plans are based on implementing the EU waste hierarchy

National Climate Change Strategy

The National Climate Change Strategy was introduced in October 2000 and detailed the proposed measures to be taken to combat the emission of global warming gases such as CO₂, methane and nitrous oxides from all sectors of the economy. Emissions from waste management activities are specifically identified in the Strategy – the waste sector creates almost 12% of all methane emissions and overall contributes 2.5 % of all global warming gases.

The Strategy calls for a reduction of 40% in waste related emissions. This is to be achieved through diversion of biodegradable waste away from landfill, and the improvement in landfill gas capture and utilisation. The generation of heat and electricity from waste in thermal treatment plants and landfill gas plants is targeted to displace CO₂ emissions from fossil fuel based plants. The Strategy also identifies the opportunity to generate energy from animal manure and slurry (possibly in conjunction with food waste).

Race Against Waste Initiative

In 2003 the DOEHLG launched a major new public awareness and information campaign entitled 'Race Against Waste'. The campaign aims to drive home the message that there is a crisis in waste management and that everyone has a responsibility to respond and improve our attitudes and practices. The campaign will feature initiatives and practical measures that can be taken by individuals and businesses in helping to solve waste management problems, including measures for dealing with biodegradable waste.

2 CURRENT WASTE MANAGEMENT PERFORMANCE

Ireland is in the process of transforming to an integrated system of waste management, moving away from the current dominance of landfill disposal. Performance in terms of waste recycling and recovery is improving, however another trend has emerged over the past decade – we are generating ever increasing quantities of waste.

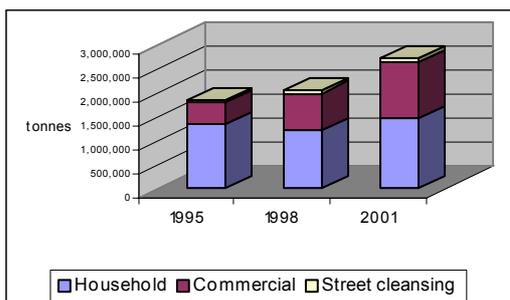
2.1 MUNICIPAL WASTE TRENDS

Waste generation is reported by the Environmental Protection Agency in the National Waste Database Reports issued at three-yearly intervals over the period 1995 to 2001. Municipal waste generation has increased by 46% in that 6-year period, with 2.7 million tonnes of waste arising in 2001. That means for each inhabitant, 690 Kg of municipal waste is generated each year. The growth in waste coincides with the prosperity of recent years, and can be attributed to:

Population growth – between 1996 and 2002 the population grew by 8%

Economic growth – output by industry and commerce increased dramatically since 1995. The average amount of waste produced per person has increased in line with this economic performance.

Better data collection and reporting – almost all waste facilities now have weighbridges and recording of waste movements is improving, particularly for commercial waste.



Municipal Waste Growth from 1995 to 2001

There has been a slow but steady improvement in the amount of waste that is recovered by the recycling industry in the last 5 years. Greater volumes of packaging – including cardboard, paper and wood – are being recycled, particularly in the commercial and industrial sectors.

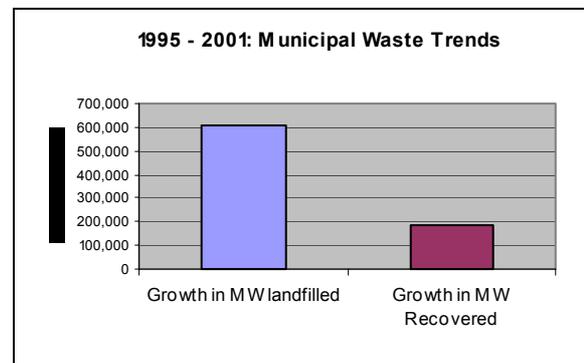
The improvement in recycling has not been adequate to reduce the reliance on waste disposal, due to waste growth.

Table 2.1 - Biodegradable Municipal Waste generation, 2001

Material (tonnes)	Gross Quantity Available	Landfill	Recovered
Paper/ Cardboard	804,414	638,109	166,305
Textiles	60,073	56,013	4,060
Organic Waste	578,158	555,926	22,233
Wood	48,626	7,372	41,254
Total	1,491,272	1,257,420	233,852

Source: EPA National Waste Database, 2001

The increased landfilling since 1995 greatly increases the required extent of Ireland's diversion performance, since the Landfill Directive targets are based on our waste generation in that year.



Change in the period 1995 – 2001: waste generated versus waste recycled

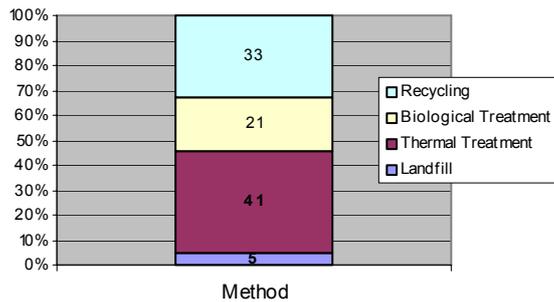
2.2 IMPLEMENTATION OF WASTE MANAGEMENT PLANS

The implementation of statutory Waste Management Plans is underway since 2001, generally on a regional basis. New collection systems and waste management facilities are being put in place by both public and private sectors.

The Waste Management Plans contain ambitious targets for waste recycling and energy recovery with the targets of the EU Landfill Directive in mind. The graphic below was generated by combining the targets of all waste plans for their 'end year' which typically was 2013.

Based on surveys carried out during 2003, approximately 15% of municipal waste generated is currently diverted from landfill. By contrast the targets of the Plans typically require up to 90% diversion of MSW from landfill by 2013.

Combined Waste Plan Targets for BMW



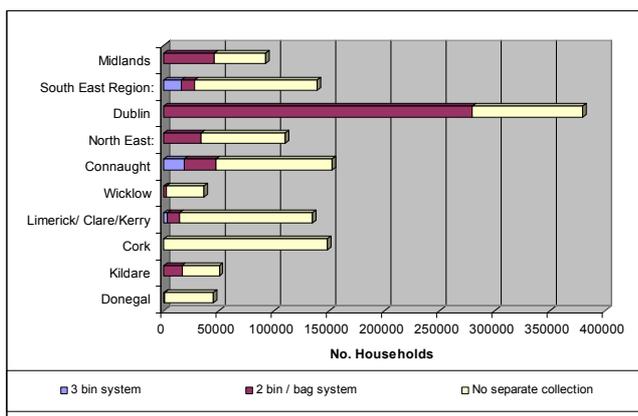
2.2.1 Household Waste

Policies for household waste diversion revolve primarily around improving the collection systems for dry recyclables (paper, card, and plastics) and organic waste (food, garden) and ensuring that recycling facilities are made available for the reception and treatment of these materials.

Separate collections have already been established in many areas. The current position is that approximately 560,000 Irish households are now serviced with a multi-bin collection. This corresponds to 42% of the population of the State.

The number of 'bring facilities' across the country has also increased dramatically, although these typically do not cater for paper or cardboard.

In addition, a network of drive-in Recycling Centres (Civic Amenities) is under development, many facilities benefiting from capital grant assistance under the "Regional Operational Programmes, 2000-2006 – Capital Grants Scheme for Waste Management Infrastructure Projects"



Extent of household separate collections, July 2003

Much of the positive progress in household waste collections was not demonstrated in the EPA data for 2001 (the household recycling rate was 5.6%), but will become apparent in the next National Waste Database Report. There is a need to improve the performance of the separate collection schemes, in

terms of the range and quantity of materials recovered and level of data collection and reporting.

A significant number of households remain without any regular waste collection service, and illegal household waste disposal through burning and dumping continues though the scale is difficult to determine.

Approximately 80,000 home compost bins have been supplied by local authorities in the period 2000-2003. This suggests that at least 6% of households in the country already have compost bins. If those in multi-storey dwellings are excluded, this means that of households with gardens, approximately 1 in 10 has probably engaged in home composting of some kind.

Table 2.2 – Local Authority Sales of Compost Bins up to July 2003

Region	Compost Bins Sold
Connaught	11,754
Cork (estimate)	4,500
Dublin	9,400
Midlands	4,660
Mid West	10,200
North East	5,100
South East	14,800
Wicklow	6,900
Donegal	4,500
Kildare	6,900
<i>Total</i>	<i>78,714</i>

2.2.2 Commercial Waste

The recycling rate for commercial waste collected in 2001 was 23.8 %. The recycling rate has grown steadily since 1995 (15.3%) and is closely linked to improved recovery of commercial packaging waste – mainly cardboard, plastic and wood - in line with our obligations under the EU Packaging Directive (2004/12/EC).



Dublin City Council now collects cardboard separately in the City Centre. Most commercial waste recycling is undertaken by private waste management contractors affiliated to REPAK.

Another driving factor for commercial recycling is the recent dramatic increases in landfill gate fees, which have made it more cost effective for enterprises to separate recyclables rather than disposing of them with mixed waste.

2.2.3 Materials Recovery Facilities

Materials Recovery Facilities typically focus on removing materials such as paper, plastic metal, glass etc. from the waste stream and preparing these for recycling markets. Recycling capacity has extended substantially mainly among private waste management companies. Trends in recovery of waste paper serve to indicate performance levels for materials recovery (table 2.2 below). Despite improvements, the dependency on landfill is still substantial. A total of 166,305 tonnes (20.7%) of household and commercial paper waste was recovered in Ireland in 2001, while 638,109 tonnes (79.3%) was landfilled

Table 2.3 – Waste Paper Recovery Trends

	Household Sector		Commercial Sector	
	% Disposal	% Recovery	% Disposal	% Recovery
1995	86.5%	13.5%	81%	19%
1998	96.8%	3.2%	79%	21%
2001	92.6%	7.4%	71.3%	28.7%

2.2.4 Biological Treatment Facilities

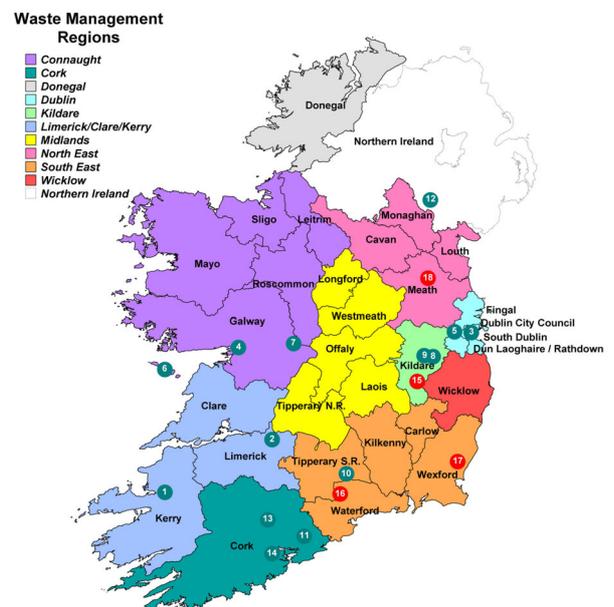
Composting Facilities

Source segregated household waste commonly referred to as 'biowaste' and other wastes such as green waste, commercial organic waste and sludge currently account for approximately 61,950 tonnes of waste material composted in Ireland annually (2003).

There are sixteen composting facilities in operation in the Republic of Ireland at present with four further facilities located in Northern Ireland. Windrow composting remains the most prevalent form of composting technology used in Ireland followed by in-vessel and aerated systems. All facilities are working at near full capacity, and significant expansion is underway with several new facilities in the process of getting authorisation.

Anaerobic Digestion (AD) Facilities

There are currently three centralised Anaerobic Digesters operating in the Republic of Ireland, with a fourth being operated in County Fermanagh. The three plants operating in Ireland, at Ballymacarbery, Co. Waterford; Adamstown, Co. Wexford; and the Camphill Community in Kilkenny have been focussed on the treatment of farm waste since their commissioning while the latter two still operate solely from the use of viable farm wastes as their bio-matter source. The AD plant in Ballymacarbery has been performing trials on the biodegradable fraction of both MSW and Commercial/Industrial wastes.



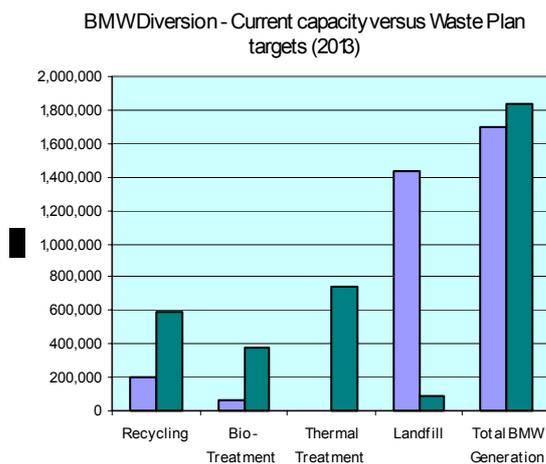
Biowaste Composting Facilities in Ireland, 2003

2.2.5 Thermal Treatment Facilities

Thermal treatment with Energy Recovery is proposed in 6 Regions for residual municipal waste. To date two proposals for incineration plants in the North East region (150,000 tpa) and the Dublin East region (400 – 500 tpa) are well underway. A facility has also been suggested for the Cork region, that would treat municipal waste at a co-incineration facility with hazardous waste. There is a lengthy period required for obtaining planning, IPC licensing and construction/ commissioning of these facilities, therefore it is imperative that the process of procuring facilities gets underway as quickly as possible in those regions which have yet to make a start.

2.2.6 Summary

The following graphic illustrates the current BMW treatment capacity available against the capacity recommended in the Waste Management Plans combined for all Regions.



In order to meet the targets of the plans, a several fold increase in the recycling capacity and biological treatment capacity is required. No thermal treatment capacity has yet been delivered. Landfilling of waste is running ahead of waste plan projections.



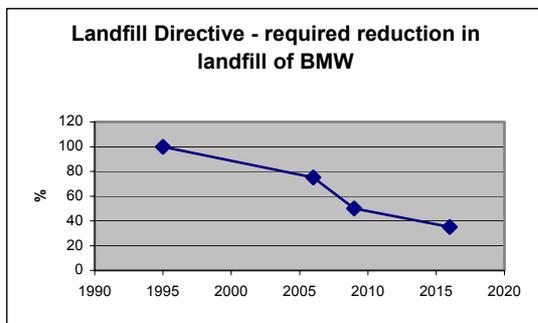
Central Composting Facility at Waterford City

3 DIRECTIVE TARGETS – SCALE OF THE CHALLENGE

3.1 MANDATORY REQUIREMENTS

The EU Landfill Directive 1999/31/EC sets out the targets for diversion of biodegradable municipal waste (BMW) from landfill in Ireland.

The first target is for the year 2006, by which we should reduce BMW landfilling to 75% of the amount of BMW generated in 1995. Further reductions are required in 2009 (50%) and by 2016 (35%).



The baseline waste generation in 1995 was reported by the EPA, enabling our specific targets to be defined as follows:

Table 3.1 – Ireland’s Targets for landfilling

1995	(Baseline BMW generation)	1,160,690*
Year	Target	BMW tonnes allowed in landfill
2006	75%	843,303
2009	50%	562,202
2016	35%	393,541

* Data from EPA National Waste Database 1995- MW generation multiplied by biodegradable content

3.2 PROJECTING WASTE GROWTH

In order to assess the implications of these targets, future waste generation and composition must be considered.

Reference has been made to the EPA National Waste Database Report, the Economic and Social

Research Institute “Medium-Term Review 2003-2010”, and the Census of Population 2002 (CSO). Ongoing economic growth is forecast, with a projected increase in GDP of between 3% and 5% over the coming decade. Population trends also display a steady upward trend.

A waste growth rate of 3.8% per annum has been applied for the period of the Strategy. This is the growth rate that was experienced in the period 1995-1998. While economic growth and population growth may moderate in the coming years, choosing a relatively high growth rate such as this means the strategy should prescribe adequate waste recovery capacity and in any case there will be no difficulty if the landfill diversion targets are ultimately exceeded.

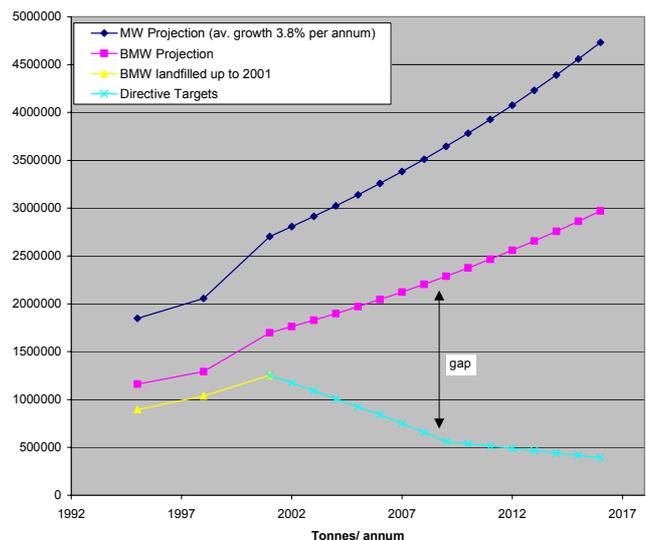
Waste Composition - This strategy assumes that waste will maintain a constant biodegradable content.

3.3 GAP ASSESSMENT

As outlined in Section 2, waste growth since 1995 means we are landfilling more BMW now than ever before, in other words diverging away from our mandatory targets.

The figure below outlines the annual tonnage of waste that must be diverted from landfill, bearing in mind the waste growth predicted for the future.

The ‘gap’ represents the amount of biodegradable municipal waste that must be channelled away from landfill in order for our mandatory requirements to be met.



Wicklow	3.5	43,306	62,147	92,796
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The gap points out the capacity that must be put in place to deal with biodegradable municipal waste diverted from landfill.

Currently c. 440,000 tonnes/ annum of BMW are diverted from landfill (mainly in favour of recycling and recovery). This must increase to 1,000,000 tonnes in 2006, rising to 1.5 million tonnes by 2009. This represents a huge challenge to the Irish waste industry.

Table 3.2 - Gap Analysis – Total Treatment Capacity Required

Year	Gap (waste growth: 3.8 % p.a.)
2001 Existing gap	440,000
2006	1,202,947
2009	1,726,297
2016	2,577,661

3.4 REGIONAL GAP ASSESSMENT

The national waste generation can be allocated according to waste management region based on the overall municipal waste generation in 2001. This enables the gap or 'target diversion capacity' for each region to be outlined. Note that this includes biodegradable municipal waste only, and further capacity is required for other materials such as plastic and metals.

Table 3.3 Gap Analysis – Treatment Capacity required for BMW regionally

Region	% MW in 2001	2006 Gap	2009 Gap	2016 Gap
Nationally	100	1,202,947	1,726,297	2,577,661
Dublin	32.9	395,770	567,952	848,050
Cork	12.7	152,774	219,240	327,363
Connaught	12.3	147,962	212,335	317,052
South East	9.8	117,889	169,177	252,611
Mid West	9.6	115,483	165,725	247,455
North East	7.8	93,830	134,651	201,058
Midlands	6.9	83,003	119,114	177,859
Donegal	1.8	21,653	31,073	46,398
Kildare	2.5	30,074	43,157	64,442

3.5 SUMMARY

The scale of the challenge to meet the Landfill Directive targets is great and requires urgent and concerted efforts.

Our targets are linked to waste generation levels in 1995, prior to a period of economic expansion.

Waste growth has been stronger than predicted in policies and Waste Management Plans, therefore the capacity required to meet our targets must be revised upwards.



Landfilling of BMW must be reduced from circa 1.4 million tonnes to 843,000 tonnes by 2006

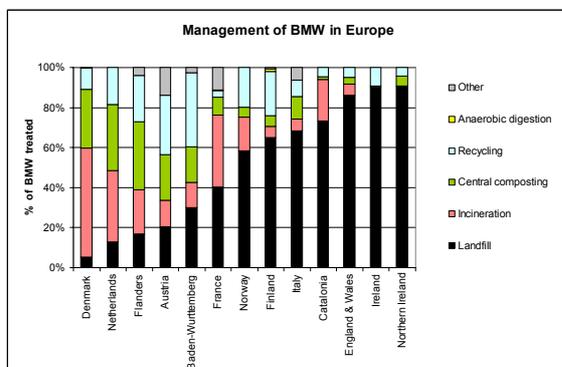
4 INTERNATIONAL PERSPECTIVE

4.1 OVERVIEW

To reduce the environmental impacts of landfilling, diversion targets were set in the Landfill Directive (1999/31/EC) for biodegradable municipal waste (BMW). The Directive also requires EU Member States to submit national strategies for the management of BMW to the Commission, which should describe how each country will meet the landfill diversion targets and improve the management of BMW.

An estimated 60-70% of all municipal solid waste generated in the EU is biodegradable and more than half of this waste is currently landfilled. However, there is a substantial difference between Member States regarding the amount of BMW diverted from landfill. For example, less than 20 % of BMW is landfilled in Austria, the Netherlands and Denmark compared to more than 80% in Ireland and Catalonia, Spain and the United Kingdom.

Figure 4.1 – Management of BMW in Europe



Source European Environment Agency, 2002

Numerous countries have adopted targets (both statutory and non-statutory) in their national waste management plans for separate collection, recycling, and biological treatment.

Denmark has recently adopted a recycling target for waste paper and cardboard of 60% in 2008, corresponding to current recycling levels. The Netherlands has a particularly ambitious target of 75% separate collection and recycling of paper and cardboard from households and commerce by 2006.

Belgium aims to collect 71% of total biodegradable household waste separately by 2007. Current participation rates in separate collection are 96% for garden waste and 57% for food waste. Composting of garden waste in Denmark is currently 99%.

The Netherlands collect bulky garden waste for composting separately, and have set targets of 55% and 60% for separate collection and biological treatment of food waste from households and commerce respectively by 2006.

Other countries have taken regulatory steps to curtail landfilling – for example Austria has decided that as of 2004, only waste with a biodegradable content of less than 5% will be allowed into landfill.

4.2 INTEGRATED MIX OF TREATMENT OPTIONS

Countries that have succeeded in diverting large quantities of BMW from landfill employ the following alternative treatment options simultaneously:

- material recycling for paper and cardboard waste
- central composting, mainly for garden waste and, to a lesser extent, for food waste
- thermal treatment for residual 'mixed' (or 'bagged') waste.

High recycling rates for paper and cardboard waste have been achieved by providing widespread separate collection systems. Access to paper reprocessing mills is generally available.

Countries with substantial central composting, mainly treat garden waste and, to a lesser extent, food waste. Anaerobic digestion is also in use, but to a much lesser extent. Countries producing high quality compost/digestate all have extensive separate collection, well-established quality assurance systems for compost, and compost standards.

Finally, all countries with high landfill diversion rates use thermal treatment for a considerable proportion of traditional, 'mixed waste' collection of BMW. Thermal treatment is mainly incineration with energy recovery. Use of the emerging technologies pyrolysis and gasification is limited, but may become more widespread in the future when adequately proven. Older incineration plants with lower environmental controls have generally been either upgraded or closed, and as well as meeting the

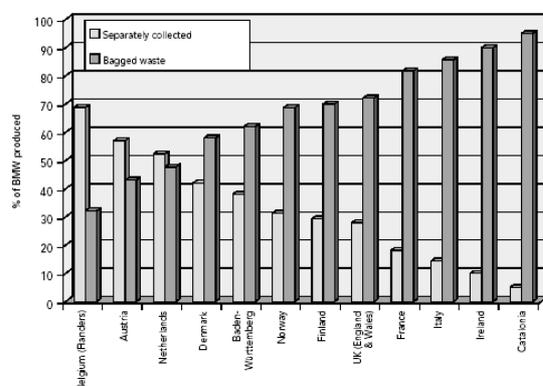
emissions criteria of the Incineration Directive (2000/76/EC) all plants should include recovery of the energy produced.



'Drop-off' point for organic household waste – urban location in Spain

A small fraction of the 'mixed' or 'residual' waste is subjected to mechanical-biological treatment (MBT), mainly central composting for mass volume reduction only, prior to landfilling and/or incineration. Some MBT installations separate and recover an organic fraction – the stabilised material produced is likely to be suitable only for very low-grade uses such as top dressing on landfill cover.

Figure 4.2 - Separate collection of municipal waste in the EU



Source European Environment Agency, 2002

4.3 WIDE RANGE OF POLICY INSTRUMENTS USED

Countries with a high landfill diversion rate for BMW make use of a wide range of policy instruments that generally promote separate collection, landfill diversion and help create markets for recovered materials. The principal mechanisms used on an international basis are outlined briefly below. It is important to note that several of these are often used together since individually they do not provide a complete solution.

- **Separate Collection of Biodegradable Waste** – all waste collectors are required to provide separate bins for organic waste fractions (e.g. paper bin, food and garden waste bin), and the waste producer is encouraged and in most cases obliged to make use of the facility. The material is then delivered to recycling or composting plants rather than landfill. Investment in public awareness and promotion of source separation schemes is essential.
- **Regulation** – use of legal instruments at national or local level to control waste collection activities and disposal practices in order to reduce the amount being landfilled. Examples of regulation include:
 - **Landfill Prohibitions** – an example would be a bye-law restricting the disposal of waste cardboard at municipal landfill sites, meaning waste collection companies must take the material to a recovery facility
 - **Waste Collection Permits and Waste Bye-Laws** – these tools can be used to dictate the collection system, frequency, method of charging etc.. on the waste collector and the waste producer respectively
 - **Mandatory Targets** – central government can relay its obligations down to regional and local level setting strict limits on waste disposal, that would result in fines/ sanctions were these limits to be exceeded.
- **Economic Incentives** – in structuring waste charges, an incentive can be given for practices that help to reduce landfilling of biodegradable waste. For example, a lower waste collection fee can be applied to separated food or garden waste, or at the disposal facility, a lower gate fee might be applied to waste that does not contain biodegradable material.
- **Landfill Levies** – this tool enables environmentally unsustainable practices such as disposal to be penalised by imposing an environmental levy – as well as making disposal less attractive, the money collected is invested in developing better waste prevention/ minimisation and recovery facilities that also serve to increase diversion from landfill. This mechanism is already in place in Ireland, the UK, Denmark and several other countries.
- **Tradable Certificates** – this approach can be employed to offer a financial incentive to landfill operators to reduce landfilling of biodegradable waste. Each region or operator is given a

target for disposal, and exceedence of the target would result in a financial penalty. An alternative to the penalty is to purchase 'credits' or certificates from other operators who have landfilled below their target. The system aims to encourage improved diversion of waste with economic dividends, and is being introduced on a trial level in Scotland.

- **Producer Responsibility Agreements** – the industry sector that creates the material or product takes a collective decision play a role in the management of the material after its useful life has ended, often by undertaking (or contributing to the costs of) recycling.
- **Market Development** – it is widely recognised that measures to encourage market demand for the recovered biodegradable material – e.g. paper, compost – is an effective way to make diversion of waste more economically viable. While the other mechanisms described above serve to 'push' material towards recycling and biological treatment, by assisting market development a 'pull' can be created for the end products which ultimately reduces the cost of waste recovery. Mechanisms in support of market development include:
 - **Compost Standards:** setting a national standard that clearly categorises the end-product according to its origin and components. Limits can be set on the content of potential pollutants e.g. heavy metals or pathogens. The end-user can then be supplied with a product consistently within known limits. This standard can be linked to the proposed end use of the product.
 - **Quality Assurance Systems** – this approach goes further than just testing the compost product – it certifies the origin, treatment process and end product to a strict set of guidelines. Products bear a quality symbol on the packaging. This serves to overcome any consumer doubts about using a material derived from waste. In the UK, a compost quality assurance programme labelled as the PAS100 standard.
 - **Co-operation with Market Sectors** – methods can be pursued to assist the development of recovery capacity, such as providing technical guidance, assisting cross-sector training and awareness programmes etc.. An example would be co-operation between waste industry and the growing media industry.



Householder Information for the separate 'biowaste' ('Bioabfall') collection system in Heidelberg, Germany

5 BIODEGRADABLE MUNICIPAL WASTE STRATEGY FOR IRELAND

5.1 OVERVIEW

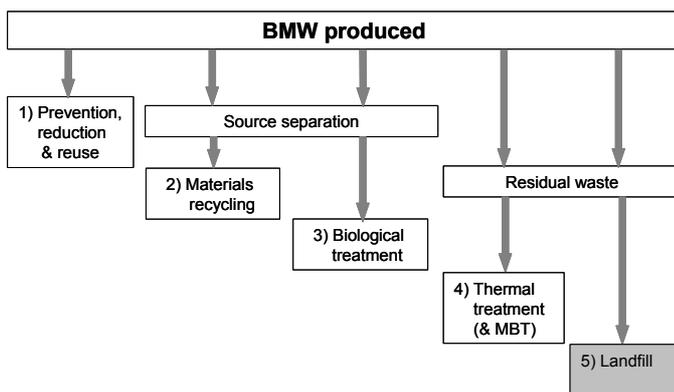
To reduce the environmental impacts of landfilling and meet the targets set in the Landfill Directive, the management of BMW will be improved by implementing a range of options.

The most desirable option is waste prevention or reduction of biowaste production, to minimise the amount of waste requiring collection and treatment. Home composting is a practical example of waste reduction. The next most desirable option is reusing biowaste, such as cardboard and textiles. This strategy provides a combination of measures based on education/ awareness and economic instruments aimed at reducing BMW arisings.

For biodegradable waste that must be collected and managed, materials recycling and biological treatment are favoured, since they recover the material for new beneficial uses.

Other options that will be pursued to divert BMW from landfill include thermal treatment – which enables the energy content of the residual waste to be captured and used, and pre-treatment systems that decrease the biodegradable content of residual waste prior to thermal treatment or landfill .

Figure 5.1 – Summary of Strategy Approach



5.2 STRATEGY PRINCIPLES

The fundamental principles of the strategy can be summarised as follows:

- Employing a combination of instruments to promote waste reduction – including awareness measures, economic incentives, and regulatory measures.

- Continuing to develop an integrated waste system building on proposals and policies in regional waste plans and strengthening these where necessary.
- Emphasis on source separation of biodegradable wastes by the producer, followed by separate collections by the collector, enabling high quality recyclables to be recovered
- Striving to maximise the recovery of materials firstly, and energy secondly as a sustainable means of treating waste, rather than diverting from landfill to other forms of disposal
- Developing partnerships with other sectors (industry, agriculture, fisheries etc.) enabling cost effective treatment systems to be established suited to Irish conditions

5.3 ESTABLISHING TARGETS

As a result of the substantial increase in the amount of BMW generated over the past 8 years, additional BMW will need to be diverted from landfill, despite current progress in recycling and biological treatment.

The principal target year chosen for the Draft Strategy is 2009, which gives a realistic opportunity for recommendations to be implemented and provides local authorities with an opportunity to include the Strategy in the review of their waste management plans. There is an urgent need to commence establishment of the necessary recycling, biological and thermal treatment facilities. The market development initiatives outlined and other supporting instruments also need to be put in place quickly. Targets for 2006 and 2016 have also been included in the implementation summary in Table 14.3.

Meeting the national recycling and biological treatment targets and the EU landfill diversion targets will result in the diversion of 76% of all BMW. Approximately 1.8 million tonnes of BMW will need to be diverted annually from landfill by 2009 if current waste growth continues. This will require a substantial provision of additional recovery capacity, compared to the current capacity of approximately 306,000 tonnes per annum.

Ambitious targets for capture and recovery of paper/ cardboard and food/ garden waste are set out. These targets are developed with regard to the performance of leading countries or regions (such as Flanders, Germany, the Netherlands) on the one hand, and Ireland's current point of low recovery levels.

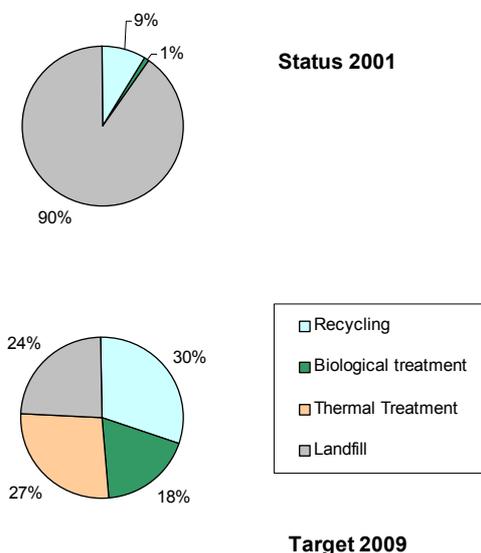
The quantities diverted by these means are still not sufficient to entirely bridge the gap between waste generation and the Landfill Directive targets. Meeting targets will therefore require that the majority of residual biowaste, which is not suitable for recycling or biological treatment or is not collected separately, is pre-treated prior to landfill. Two broad categories of treatment are available, thermal treatment with energy recovery and Mechanical-Biological Treatment (MBT) with thermal treatment or landfill of the stabilised residue.

The following targets for biodegradable municipal waste are required to form an effective diversion strategy.

Table 5.1 – Proposed BMW Diversion targets (tonnes)

BMW Treatment in 2009		
	Percent of BMW	Tonnes Diverted
Recycled	30	706,082
Biological Treatment	18	424,788
Total Recycling	48%	
Thermal Treatment	27	641,681
Total Diversion	76%	1,772,551
Landfill	24	(569,881)

Figure 5.2 - Summary of Strategy Targets



5.4 KEY WASTE STREAMS

Paper and Cardboard

Waste paper and cardboard that cannot be reused should be segregated and collected separately for recycling. Targets for recycling of municipal waste paper and cardboard are 45% for households and 60% for commerce. The ambitious targets for materials recycling will require "collect" systems including both kerbside (domestic) and commercial collections, coupled with extensive "bring" systems including bring banks and recycling centres (civic amenity facilities).

Food and Garden Waste

Diverting BMW away from landfill will require a high level of source separation of food and garden waste followed by biological treatment, either composting or anaerobic digestion. The aim of biological treatment is to produce a high quality, marketable product.

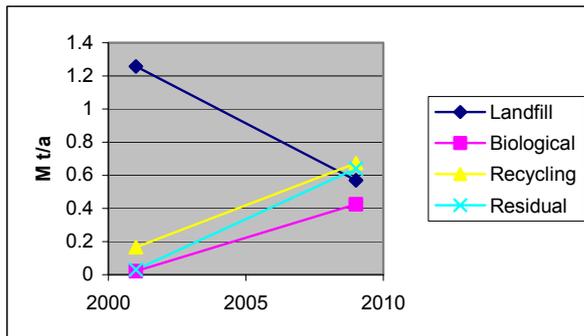
Home composting is suitable for garden waste and food waste of vegetable origin, and can divert a maximum of 5-10% of organic waste. The target set is to treat 7% of all food waste and 40% of all garden waste by home composting in households with gardens.

Separate collection will therefore be required and the provision of composting facilities for garden waste and centralised biological treatment facilities for food waste. The targets for central biological treatment are: households - 48% for garden waste and 30% for food waste by 2009 and commerce - 40% of food waste.

Residual Waste

A target of 27% is set for treatment of residual waste. This sets a requirement for 641,000 tonnes of residual BMW treatment capacity, without which the Landfill Directive targets will not be achieved in 2009. The residual treatment identified in most Regional Waste Management Plans is thermal treatment with energy recovery, although pre-treatment by mechanical-biological means can also play a role, followed by thermal treatment or landfill.

Figure 5.3 – National Treatment Capacity Targets for BMW



The national targets for BMW diversion for the year 2009 have been allocated regionally based on waste arisings in 2001. The capacity required for recycling (paper/ cardboard), biological treatment (incl central and home composting) and thermal or residual treatment of biodegradable waste are shown.

Table 5.2 - Indicative Target Capacity in recycling, biological and residual treatment in 2009, distributed regionally.

Region (all tonnes/ annum)	Diversion Target	Recycled BMW	Biological BMW*	Residual BMW
<i>Nationally</i>	1,772,551	706,082	351,539	641,681
Dublin	584,942	233,007	116,008	211,755
Cork	230,432	91,791	45,700	83,419
Connaught	212,706	84,730	42,185	77,002
South East	177,255	70,608	35,154	64,168
Mid West	177,255	70,608	35,154	64,168
North East	141,804	56,487	28,123	51,334
Midlands	124,079	49,426	24,608	44,918
Donegal	35,451	14,122	7,031	12,834
Kildare	53,177	21,182	10,546	19,250
Wicklow	35,451	14,122	7,031	12,834

* central biological facilities only, not incl home composting

This data should be reviewed and updated by each regional waste management plan, and each Plan will re-affirm how biodegradable waste diversion will be achieved locally.

6 PREVENTION AND MINIMISATION OF BMW

Waste prevention and minimisation are the preferred management options in the waste hierarchy and are, especially in the long term, an essential way to reduce the quantity of BMW consigned to landfill.

Prevention means reducing the quantity and harmfulness to the environment of waste and the materials and substances contained within waste.

Minimisation means any technique, process or activity that either avoids, reduces or eliminates waste at its source, or results in re-use or recycling.

These are the most desirable options for waste management because it has the least environmental impact. The absence of waste eliminates the need for waste handling, transportation and treatment. Waste reduction measures including reuse of textiles and home-composting of organic waste are also included in this section.

6.1 CURRENT PERFORMANCE

Between 1995 and 2001, the amount of BMW produced increased by about 46 % (see section 2.1). This rapid increase in waste quantities produced is a result of Ireland's high economic growth since 1995, coupled with the continually improving quality of data, which has meant that more of the waste produced is now being registered. The increase has been more pronounced in the commercial sector compared to household waste.

Table 6.1 - Municipal Waste Generation Trends

Indicator	1995	1998	2001
Household waste arising/ person	0.38 t	0.32 t	0.37 t
Household waste collected/ person	0.29 t	0.32 t	0.34 t
Commercial waste generated/ person	0.14 t	0.19 t	0.25 t

6.2 POLICY

The waste prevention initiatives of this strategy aim to stabilise waste growth and lead to a decoupling in waste growth compared to economic growth. The target is to reach a steady level of 'per capita' municipal waste generation.

Sustained implementation of waste prevention measures should thereafter lead to a decrease in the amount of waste produced.

The national policy for preventing and minimising waste outlined in "Delivering Change" also applies to BMW. For BMW, waste prevention refers mainly to reducing the quantity of paper and cardboard. Waste minimisation includes home composting as a way of reducing the amount of food and garden waste requiring collection and treatment.

6.3 STRATEGY INITIATIVES

6.3.1 National Waste Prevention Programme

Waste prevention requires a fundamental change in our attitudes and behaviour towards consumption and waste generation. Sustained, targeted information campaigns are needed to help raise awareness of waste management issues. A Core Prevention Team is being established in the EPA to drive an ambitious and well-resourced National Waste Prevention Programme as described in the policy statement "Delivering Change".

The Waste Prevention Programme aims at delivering substantial results on waste prevention and minimisation across all waste streams, including BMW. The comprehensive Programme integrates a range of initiatives, including education and awareness measures, technical, training and financial assistance and incentivisation mechanisms. An important initiative proposed for BMW promotes the use of recycled and recyclable materials in public procurement policies, including ensuring that all public authorities routinely use recycled paper by 2004.

Information campaigns about waste prevention and minimisation will continue to be implemented at local level by local authorities through the 'Environmental Awareness Officers'.

A further initiative undertaken in the Limerick/ Clare/ Kerry Region is the appointment of a Regional Industrial Waste Minimisation Officer who will assist industry in responding to waste reduction targets by organising seminars, publishing newsletters and by assisting in the development of industrial networks between such groups as the chamber of commerce, the EPA, third level institutions and so on, to facilitate communication within industry. Similar appointments are expected to be made by other local authorities or regions.

Waste prevention and minimisation is a fundamental aspect of IPPC licensing and is integrated in the EPA Core Prevention Team's work on Waste Audits and Waste Reduction Programmes.

Also at national level, new guidelines have been issued to all public bodies (incl. Government departments, local authorities etc.) by the DOEHLG on introducing environmental considerations into public procurement. This encourages factors influencing 'sustainability' to be used as criteria of assessment when tendering works, service contracts and supply contract. Application of the guidelines may for example lead to the use of a greater proportion of recycled materials in new works, or specifying reusable packaging for raw materials, as well as leading to energy efficiency and assessment of 'life-cycle costs' in goods or services that are contracted.

6.3.2 Pay-as-you-throw schemes

Once comprehensive recycling systems are in place, local authorities will be encouraged to implement pay-as-you-throw (PAYT) schemes for household waste. PAYT schemes can increase waste prevention as well as increase levels of source separation. Most commercial waste collection is already based on a volume or frequency related charge. Businesses are also encouraged to relate waste costs to the quantity produced.

PAYT charges can be implemented through levying the frequency of collection, the volume of waste collected or the weight of waste presented. Examples include:

- Tag-a-bin system/ Tag-a-bag system/ Pre-paid bag system – a tag is purchased and presented with each bin or bag left for collection. This already has high penetration in a number of rural counties, and has the benefit of low administrative costs.
- Choice of bin-volumes – certain collectors charge a lower annual fee for a smaller bin. Applied by various companies, particularly in urban areas.
- Weight-related charging – has been implemented at pilot level in various areas including West Cork. It is proposed as an objective in many waste management plans.

An EPA study into "The Effects of Weight Based Charges for Solid Waste Disposal" (part of the ERTDI programme) is currently being undertaken and involves an analysis of a pilot scheme in West Cork. Weight based charges have been levied to commercial customers and households. An estimation of the impact of the charges will be made following a comparison of the weights of waste collected before and after the introduction of the charges. The study will make recommendations with respect to the general implementation of a weight-based charging system considering such

factors as location, household waste composition, incomes and pricing.

Prerequisites for successful PAYT schemes include providing householders with the possibility of composting organic waste and recycling waste such as paper, glass, plastic, metal and hazardous waste. PAYT schemes also require a relatively high environmental consciousness among householders and sustained information campaigns about the system.

Good administrative systems are needed to manage most PAYT schemes, particularly for weight-related charging. Some local authorities are investing in electronic 'waste intelligence systems' that present 'status sheets' or invoices for a particular customer detailing their account (address, bin size, amount of waste presented each week etc.) at the touch of a button. In this way each customer can clearly see the link between their practices and their weekly waste bill.

The critical element for all successful PAYT schemes is that fees are carefully set for different bins/ services ensuring an incentive to minimise residual (mixed) waste in favour of the alternatives – reducing waste generation and using the recycling bins.

Monitoring of implementation is recommended to identify the success of the scheme and any negative side effects.

The Minister for the Environment has set January 1st 2005 as the date by which all household waste collection services, both public and privately operated, must have commenced a PAYT system.

6.3.3 Home composting

Home composting provides a way of reducing the amount of waste to be collected, thereby minimising the environmental impacts and costs associated with managing food and garden waste. Garden waste and food waste of vegetable origin are suitable for home composting. Garden waste from public parks and gardens should also preferably be composted on-site.

International experience suggests that between 5 and 10% of all household organic waste can be home composted and thereby diverted from landfill. To reach this level requires widespread participation. Limitations exist in urban areas where space may not be available or families live in multi-storey apartments.

Flanders in Belgium has a well developed home composting programme coordinated by VLACO, the Flemish composting organisation. In order to promote home composting three tools were used to

convince people to home compost: 'sensitisation' (or awareness), the polluter pays principle and the availability of cheap home composters.

Sensitisation - by providing information, undertaking campaigns concerning waste prevention, and creating consciousness within the people - was the most decisive measure taken in promoting home composting.

Direct financial subsidies and the pricing of residual waste as well as biowaste collection graded against the organic waste prevention via home composting helped to encourage home composting in Flanders.

The number of people active in home composting in Flanders grew from 19% in 1997 to 35% in 2002. 17% of the city populations and 39% of rural populations participate in home composting.

Onsite composting is a particularly important activity for schools, since the actual composting process itself is relevant to the science curriculum and provides a focus for environmental learning. Awareness raising in schools is a particularly effective way of building up long term benefits of environmental awareness including waste prevention and minimisation.



6.3.4 Reuse of packaging, and product design

An integrated policy is required for successful waste prevention. There will be increased focus on waste prevention in the areas of resource management and integrated product policy. A series of Producer Responsibility Initiatives are proposed (Chapter 14) with the intention of encouraging the producers to implement practical waste reduction/ redesign opportunities.

Further dialogue with the Packaging Industry is required to move beyond waste recovery schemes and towards product policy initiatives that will focus on packaging design, ease of identity and separation of packaging stream, reusable packaging

initiatives etc. This is expected to form one aspect of the work of the EPA Core Prevention team.

The concept of 'Integrated Product Policy' encourages manufacturers to think about the entire life-cycle of the product including what happens to it and its packaging during their working life and in the post-consumer stage – up to recently many companies only considered impacts until a product 'reached the shelf'. Good practices will identify environmental impacts – e.g. pollution during manufacture, high energy usage, or generation of excessive waste - and seek to reduce the overall impact of the product by redesigning the product or process concerned.

6.3.5 Reuse of textiles

The quantity of waste textiles generated in Ireland in the municipal waste (household + commercial) sector, from 1995-2001 are estimated in the table below. Textiles should be collected separately and reused, particularly clothes from households.

Table 6.2 - Textile Generation and Recovery in 2001

Quantity generated	60,058 tonnes
Landfill	56,014 tonnes
Recovery	4,044 tonnes
Recovery Rate	5%

(Source: EPA National Waste Database Report 2001)

Good quality textiles should be dropped off by householders to charity and second-hand shops. Local authorities will also be encouraged to improve the availability of bring banks for clothing and to accept waste textiles at recycling centres. Options for collecting textiles with kerbside recyclables should be explored. Textile waste accounts for just 4 % of the total BMW stream. It is possible that as much as 50 % of all textile waste is suitable for reuse.

The Strategy target is to divert 40% of textile waste to reuse and recycling by 2009. The DOEHLG and local authorities will work in partnership with the local authorities to expand existing capacity to handle the extra materials.

Local authorities will be encouraged to promote source separation of reusable waste textiles by information campaigns.

The public should patronise charity shops to ensure that opportunities for reuse are fully availed of and discarded materials do not have to be consigned to landfill.

7 RECYCLING OF PAPER AND CARDBOARD

Ambitious recycling rates for paper and cardboard will be pursued to meet the landfill diversion targets for BMW.

7.1 CURRENT STATUS

The percentages of household waste paper and cardboard currently being recovered are low — only 7% in 2001, compared to 29% for the commercial sector. The dependency on landfill is therefore substantial. Despite an increase in the absolute quantities of paper and cardboard being recovered since 1995, the growth in the total amount of waste means that the overall recycling rate has decreased.

Table 7.1 - Household waste paper/cardboard status (2001)

	Household	Commerce
Quantity generated	323,144 t	502,352 t
Landfill	279,833, 93% of total	358,276 t, 71% of total
Recovery	22,229 tonnes, 7% of total	144,076 t, 29% of total

7.2 TARGET

The target is to achieve 45% recycling of paper and cardboard waste generated by households and 60% recycling of commercial paper and cardboard waste by 2009. Meeting these targets can divert 30% of all BMW from landfill, compared to the overall target diversion rate of 76% by 2009.

Parallel efforts to recycle paper in the packaging waste stream are required under the EU Packaging Directive (2004/12/EC), the proposed targets for which are 60% recycling of packaging paper and cardboard by 31 December 2011 for Ireland. The 2001 National Waste Database found that 380,209 tonnes of paper and cardboard packaging waste is generated each year, equivalent to 47% of total paper/ cardboard in the municipal waste stream.

There is also a need to target the remaining 53% of paper/ cardboard and recycle non-packaging paper in particular from homes and business – newspaper and magazines, office paper, stationery etc..

7.3 COLLECTION SYSTEMS

Collection systems will have to be improved rapidly to achieve the volumes of paper required under these targets. Additional types of paper will need to be collected from both households and commerce. Collection should therefore be extended to include newsprint and writing paper etc.

Under the Waste Management (Collection Permit) Regulations 2001, all waste collection companies must hold a Collection Permit issued by the relevant local authority. The local authority can include within the Permit conditions “to ensure the segregation, treatment or recovery of all or part of the wastes collected in such a manner as may be specified”. Recent guidance issued to local authorities by the DOEHLG (circular WIR 05/04) recommends that forthcoming collection permit reviews make use of this regulatory tool to help meet waste management plan targets for collection/ recycling of target waste streams. All local authorities involved in waste collection are equally being required to meet the same collection service levels.

7.3.1 Households

Source separation is the key to maximising recycling. Progress has been made and kerbside collection schemes related to paper presently cover about 35% of all households. Further schemes include both bring bank collection points and drive-in recycling centres.

Expansion of kerbside or ‘door-to-door’ collection for households, intensive bring bank schemes and recycling centres will need to be implemented to meet these targets. Suitable collection methods for urban and rural areas are shown in the table below.

Table 7.2 - Collection Methods for household paper

	Urban areas		Rural areas
	Multi-storey households	Single dwelling households	
Paper / light card	bring banks recycling centres	kerbside, recyclables collection* bring banks recycling centres	kerbside, recyclables collection* bring banks recycling centres
Card board	recycling centres	recycling centres	recycling centres

**Kerbside collection can alternate with other collections and can be co-mingled with other dry recyclables*

7.3.2 Commerce

Waste paper and cardboard from commerce will need to be collected in separate containers for recycling. Larger commercial waste producers have generally responded positively to the separation of packaging waste. The Waste Management (Packaging) Regulations 2003 introduced an absolute obligation on producers to recover specified categories of packaging waste arisings on their premises. An even greater participation rate will be needed to meet the recycling targets, including separate collection from smaller companies. Non-packaging paper – including office paper, newspapers etc. – will have to be collected for recycling.



Separate collection of commercial paper and cardboard is already underway but needs to be increased substantially

7.4 RECOVERY INFRASTRUCTURE

There are about 40 private companies currently collecting waste paper and cardboard for recovery. Most of these companies reprocess the waste by treating, cleaning, grading, shredding or baling the paper prior to recycling.

The projected quantity of municipal waste paper and cardboard to be reprocessed prior to recycling in 2009 is approx. 673,430 tonnes. This requires an significant expansion in existing Materials Recovery Facility (MRF) capacity in all regions – these facilities will accept, separate, grade and bale various paper grades and can do so in parallel with recovery of other wastes such as packaging.

The majority of recovered paper and cardboard is exported into an international market for waste paper, (mainly to the UK but also other EU countries and other continents). There is a lack of suitable mills in Ireland, with only one paper mill in Northern Ireland and one cardboard mill in Dublin. Less than 2% of recovered paper and cardboard is shredded and used as animal bedding.

Table 7.3 – Paper & Cardboard recycling targets (2009)

	Household	Commerce	Total
Total Produced	448,954 t	785,669 t	1,234,623 t
Recycling Target	45%	60%	55%
Capacity required	202,029 t	471,401 t	673,430 t

The domestic recycling capacity for paper and cardboard is inadequate, and this issue needs to be addressed.

Table 7.4 - Summary of Measures – Paper and Cardboard

Status 2001	166,305 tonnes paper/ cardboard recovered
Target 2009	673,430 tonnes paper/ cardboard recovered. Target 45% recycling of household paper, and 60% recycling of commercial paper
Collection	All household to have access to : Kerbside recycling and recycling centres. Intensive bring banks are an option for rural areas and multi-storey urban areas. All commercial enterprises to have separate collection for paper/ cardboard
Recovery	MRF capacity to expand to 735,000 tonnes (paper/ cardboard) by 2009



8 BIOLOGICAL TREATMENT OF FOOD AND GARDEN WASTE

Organic material such as food and garden waste comprises 40% of biodegradable municipal waste. A combination of home composting and centralised biological treatment facilities will be employed to divert approximately 45% of organic waste to biological treatment of source-separated material. Meeting these targets can divert 21% of all BMW from landfill by 2009.

8.1 CURRENT STATUS

The amount of municipal food and garden waste generated in 2001 was 676,009 tonnes, accounting for approx 25% of municipal waste.

Table 8.1 Food and garden waste status, 2001

	Household food and garden waste	Commercial food and garden waste
Quantity available	423,910 t	154,248 t
Landfill	404,064 t 86% of total generated	151,862 t 63% of total generated
Recovery	19,846 t 4.7% of total generated	2,386 t 1.5% of total generated

Total biological treatment capacity in operation is approximately 60,000 tonnes/ annum, but this includes treatment of sludges and industrial waste. Performance has improved since 2001, and significant additional capacity is in planning.

8.2 TARGETS

Food and garden waste accounts for 40% of the total BMW produced. Separate collection of this organic waste will enable approx. 22 % of BMW to be diverted from landfill or 424,788 tonnes by 2009.

Targets for households for 2009 include:

- Minimum of 30% separate collection and biological treatment of food waste (from households not involved in home composting) by 2009

- 7 % home composting of garden waste and food waste of vegetable origin – targeted in areas where separate collection not in place
- 88% biological treatment of garden waste – 40% via home composting and 48% via green waste composting by 2009.
- Separate collection and biological treatment of 40% of food waste from commerce.

8.3 COLLECTION SYSTEMS

Source separation of food and garden waste is the key to maximising the production of high quality compost. As outlined in Section 7.3, regulatory measures to ensure source separation will be implemented using the Waste Management (Collection Permit) Regulations 2001, with reference to DOEHLG circular WIR (05/04).

8.3.1 Households and Communities

Households in both rural and urban areas, where there is suitable garden space, will be encouraged to compost their garden waste at home. Particular emphasis will be placed on home composting of food waste (of vegetable origin) in rural areas where separate collection system for organic waste is not feasible. Targets are based on 25% of urban households and 60% of rural households participating in home composting of food waste.

All households will be required to separate garden waste and either compost on site or deliver to a local recycling centre. Garden waste that is generated by green areas around multi-storey households should also either be composted on-site or treated at a central composting facility.

Separate collection of organic waste will be required in all urban areas, possibly extending to rural areas as part of an integrated collection system.

Table 8.2 – Collection methods for Food and Garden Waste from Households

	Urban areas		Rural areas
	Multi-storey households	Single dwelling households	
Garden	(recycling centres)	home composting recycling centres kerbside, separate collection	home composting recycling centres
Food	(kerbside, separate collection)*	home composting (veg. part only) kerbside, separate collection	home composting (veg. part only) kerbside, separate collection

* requires pilot studies in Ireland

There are some practical limitations with separate collections of food waste in urban areas of multi-unit dwellings, where the bins serve a communal area. It is recommended that pilot studies be carried out in these areas and if successful a separate collection system introduced.

Community composting facilities are an emerging system at European level, whereby local communities can become involved in the management of their own wastes, whilst implementing the proximity principle and increasing awareness of waste recycling practices within their own community. In Ireland a small number of initiatives have been undertaken, for example at an urban apartment complex, and as part of the Ballymun redevelopment project in Dublin. Other examples of where community composting might be applied include in relation to tidy-towns schemes, local composting of green waste from public open spaces, in residential housing estates or in industrial estates where groups of companies pool their resources. Interaction with farming in relation to green waste composting and vermi-composting schemes may also be considered.

8.3.2 Commerce

Capturing organic waste from commerce is required in order to meet the target for 2009. Food waste from larger enterprises should be collected in separate containers. The following commercial enterprises are particularly relevant:

- Hospitality Sector – Hotels, Restaurants, B&B's, etc.
- Canteen Kitchens – in major companies and institutions
- Retail Sector - Supermarkets, Fruit and Vegetable Shops, Food Sector retail outlets
- Businesses and Offices with kitchen/ canteen facilities

Requiring separate container collection of food waste from commerce where food waste production is > 50 Kg/week will be considered. The penetration of separate collections into the commercial sector should be progressively widened to capture greater quantities of organic waste.

8.4 BIOLOGICAL TREATMENT CAPACITY

The overall capacity to treat source-separated food and garden waste must increase substantially to meet the targets set out. The current operational capacity is c. 60,000 tonnes/ annum – this must increase to approximately 350,000 tonnes/ annum in 2009.

'Biowaste Directive'

A proposal for an EU Directive on the Biological Treatment of Biowaste is expected to be adopted in 2004. This will set standards for the suitable waste streams and treatment technologies, and standards for the products of biological treatment and their associated uses. The Environmental Protection Agency essentially has already adopted the treatment standards being promoted in the technical working documents associated with the proposed European Community Initiative on the Biological Treatment of Biodegradable Waste."

The principal treatment methods to be developed and controlled under the initiative are:

- Green Waste Composting
- Centralised Composting ('Biowaste' composting)
- Anaerobic Digestion
- Emerging Technologies

Biological treatment of BMW can be successfully carried out in tandem with other waste streams, such as agricultural wastes, organic industrial wastes, fisheries residues etc.. Co-treatment can provide economies of scale and encourage investment in the development of modern recovery

plants. Opportunities for co-treatment should be developed, but due regard must be had to the controls on waste streams and on the end product – source separated food waste is low in contaminants and heavy metals, and the resultant compost/digestate has a wide range of possible high-value end uses. Mixing with other wastes should only be carried out on the basis that these advantages are maintained.

Other local opportunities for biological treatment in a 'cross-sectoral' approach are also emerging, such as the composting or digestion of food waste on farms, or the development of composting plants close to sources of fish waste. Such avenues can provide a sustainable solution but regard should be had that the scale of facility and environmental controls are adequate to ensure full compliance with legislation.

Animal By-Products Regulation

The EU has adopted Regulation No. (EC) 1774/2002 and associated legislation laying down health rules concerning animal by-products not intended for human consumption. As a country with a large dependence on agriculture, Ireland must always be conscious of the need for caution when dealing with activities that have a potential to impact adversely on animal health and food safety. Ireland has therefore adopted particularly stringent national legislation on the management and use of Animal By-products. In pursuing the twin objectives of developing the necessary biological treatment capacity in Ireland and the need to maintain animal health and food safety standards, due care and consideration must be given to ensuring adherence to the appropriate national criteria.

Table 8.3 - Summary of Measures – Food and Garden Waste

Status 2001	22,233 tonnes municipal food and garden waste recovered (3.8 % of available)
Target 2009	424,788 Tonnes municipal food and garden waste recovered Household targets: 7 % home composting 30% household food composting 88% garden waste composting Commercial targets: 40% commercial food waste
Collection	All household to have access to : Recycling centres for green waste Home composting bin for food and garden waste Kerbside organic recycling in urban areas Relevant commercial enterprises to have separate collection for food waste Pilot collections for multi-unit dwellings
Recovery	Biological Treatment capacity to expand to 351,539 tonnes by 2009 - 10 Combination of green waste composting, central composting and anaerobic digestion



Screening matured compost at the Ballinasloe Composting Facility

9 TREATMENT OF RESIDUAL WASTE

9.1 POLICY

BMW that is not feasible for recycling or biological treatment or is collected in the form of mixed waste is termed "residual" BMW. Implementing the prevention and recycling strategies will reduce the proportion of waste arising as 'residual waste'. Typical examples of residual waste include the following:

- Mixed waste produced by households or businesses after other materials have been separated out for recycling and composting
- Residues from recycling and composting facilities – i.e. unsuitable material that is screened out
- Other waste that is not suitable for recycling or biological treatment –e.g. litter, dirty or contaminated material, etc..

Despite reaching high levels of recycling and biological treatment, significant quantities of residual waste will continue to be generated. A large proportion of this material will be biodegradable and will need to be diverted from landfill to meet the landfill diversion targets, partly due to the vast waste growth since 1995.

Policy in relation to this residual waste is critical in meeting Landfill Directive targets. Diverting residual BMW from landfill provides a 'safety net' to ensure Ireland does not breach the mandatory landfilling limits.

This Draft National Biodegradable Waste Management Strategy is designed to secure the diversion of municipal biodegradable waste from landfill. The rationale for the inclusion of a diversion requirement in the European Commission Proposal for a Council Directive on the Landfill of Waste was to both reduce the methane emissions from landfills and to encourage the separate collection of biodegradable waste. The Proposal for a Directive was drafted following the adoption by the European Commission of a Strategy Paper for reducing methane emissions, which had concluded that reduced landfilling of waste is the most effective waste treatment option at the lowest cost.

The European Commission has published a Study, undertaken by AEA Technology, entitled Waste Management Options and Climate Change and it was published in December 2001. The Study is intended to inform developing EU-level waste management policy, through a comparison of the available options for the treatment of the Municipal

Solid Waste stream. However, the Study analysis is in terms of climate change impacts only, which are only one of a number of environmental impacts that derive from solid waste management options. It must always be remembered that local factors, such as the availability of existing waste management facilities, markets for recyclables, as well as geographic, demographic and socio-economic factors, can frequently exert a more dominant influence.

The Study has shown that, in overall terms, source segregation of Municipal Solid Waste (MSW) followed by recycling (for paper, metals, textiles and plastics) and composting /Anaerobic Digestion (AD) of putrescible wastes, gives the lowest net flux of greenhouse gases, compared with other options for the treatment of bulk MSW.

In the overall context, the Study concluded that emissions of greenhouse gas associated with transportation of waste, residues and recovered materials are small in comparison with the much larger greenhouse gas fluxes in the system, such as those related to avoided energy / materials, landfill gas emissions and carbon sequestration.

This strategy aims to maximise the recovery of useful materials and energy from residual waste, in accordance with the EU Waste Hierarchy.

9.2 CURRENT STATUS

In 2001, 1,257,420 tonnes of biodegradable municipal waste was landfilled. This is effectively the waste stream currently available for 'residual treatment'.

A certain amount of organic matter is separated from mixed waste for low-grade composting – this is mainly commercial waste and is estimated at less than 30,000 tpa in 2003.

No residual municipal waste is treated by thermal treatment in Ireland, although a minor amount of residual waste has been exported to energy recovery facilities in other EU countries.

9.3 TARGETS

An estimated 1.2 million tonnes of the total BMW produced will be collected as residual waste in 2009. A target of 50% thermal treatment of this residual waste will divert approx. 27 % of BMW, enabling the Directive target to be reached.

The target capacity is 641,681 tonnes of residual waste treatment capacity in 2009.

The parallel to this target is to reduce landfill to 50% of residual BMW to 569,881 tonnes by 2009.

9.4 COLLECTION

No special collection is required – the ‘residual waste’ is collected in ordinary mixed waste collection for both household and commercial Municipal Waste. Other sources of residual waste include street cleaning material and rejected fractions or ‘residues’ from other recycling facilities.

9.5 TREATMENT CAPACITY

Two broad options are currently available for residual waste treatment, namely Thermal Treatment and Mechanical Biological Treatment (MBT). Neither system should be seen as an alternative to the separate collection and recycling policies set out in this strategy.

9.5.1 Thermal Treatment

Thermal treatment with energy recovery is already proposed in 6 Regions for managing residual municipal waste. This method provides a robust technology for dealing with mixed residual waste, and forms a necessary element in the integrated Waste Management Plans of the six regions, similar to models from other EU countries such as Germany, Belgium, Holland, Austria and Denmark.

Two facilities (Dublin, North-East) that are in the planning phase will together have a total treatment capacity of approximately 550,000 tonnes/ annum. However, a significant proportion of this waste will be composed of waste which is not biodegradable. Further facilities are required as outlined in the regional Waste Management Plans to provide certainty of meeting the national target set out above.

Given the time required to complete the processes of getting approval for a waste-to-energy plant, in terms of planning permission and waste licensing, and the construction/commissioning period subsequently required, it is imperative that the process of procuring facilities gets underway as quickly as possible in those regions which have yet to make a start. Recovering thermal energy from waste is supported by the National Climate Change Strategy. Energy recovered in the form of heat or electricity can reduce dependence on imported fossil fuels, as well as decreasing the generation of methane gas in landfills.

As well as incineration, other thermal treatment processes – e.g. pyrolysis and gasification – continue to be developed and may eventually be applicable for treatment of residual waste. The environmental requirements, including maximum emissions to air, from all thermal treatment plants are laid out in the EU Incineration Directive (2000/76/EC).

9.5.2 Mechanical-Biological Treatment

MBT is a treatment process that stabilises and reduces the volume of waste sent to thermal treatment or landfill. MBT is a generic term that covers a wide variety of processes. Mechanical separation of mixed waste using shredders, screens, magnets and other devices is followed by a biological stage where biodegradable material is broken down or stabilised. Some recyclable materials are recovered, but the majority of the residue is usually sent to energy recovery, or to landfill.

The organic material recovered by MBT typically emerges as a low quality compost “stabilised biowaste” that has limited applications. The proposed Biowaste Directive - expected to be adopted at the end of 2004 - defines MBT and restricts the use of stabilised biowaste. Examples of where the product may be used include in landfill cover, or in creating embankments and screening bunds on landfills or quarries.

The Cork Regional Waste Management Plan proposes an MBT approach to residual waste management. Procurement of a regional facility through a PPP approach is underway although delivery of the project is still 2-3 years distant. A more basic form of MBT is currently taking place to a limited extent in certain counties.

MBT is not a substitute for recycling or biological treatment. The process should be confined to the residual waste stream only, which remains after source separation and recycling. MBT can help reduce the volume of biodegradable waste to landfill by up to 25%, and is a possible alternative to thermal treatment in the short term (awaiting provision of thermal treatment capacity), provided the proposed system can guarantee that the biodegradable fraction has been completely stabilised.

Any MBT capacity developed should be compatible with treating source-separated organics in the future. A clear distinction will need to be made by regulatory authorities as to uses of MBT-derived ‘stabilised biowaste’ such that it does not counteract the development of markets for high quality compost. The development of MBT should not deflect local authorities from the longer term targets of regional waste management plans in terms of recycling and energy recovery performance and sustainability.

Table 9.1 - Summary of Measures – Residual Waste

Status 2001	1,257,420 tonnes BMW landfilled
Target 2009	Reduce landfilling of residual BMW to 569,881 tonnes
Prevention/ Minimisation measures	Refer to Section 6
Collection, Recycling and Biological Treatment	Switch from mixed collection to separate collections (Refer to Sections 7 & 8)
Recovery Capacity	<p>Provide residual treatment capacity for 641,681 tonnes of residual BMW</p> <p>Preferred methods:</p> <p>Thermal treatment with Energy Recovery</p> <p>MBT followed by Energy Recovery</p> <p>MBT with fully stabilised residue to landfill</p> <p>These methods should not be pursued as an alternative to source separation followed by recycling/ biological treatment.</p>

10 DRIVING THE STRATEGY FORWARD

10.1 EMPLOYING INSTRUMENTS

A comprehensive assessment entitled "Biodegradable Municipal Waste Management in Europe" was carried out by the European Environment Agency (January 2002). In analysing the policies of leading Member States, the report found that "a suite of strategies and instruments were successfully used to achieve the twin objectives of

1. High rates of diversion of waste from landfill
2. High rates of material recovery for BMW"

The diagram below summarises the approach recommended in the EEA Report.

The EEA Report emphasizes the need to develop adequate and reliable capacity to deal with the material separately collected. This includes facilities for treatment and recovery, and critically stable markets for the end-products.

In tandem with the promotion of separate collection, there is a parallel restriction placed on the alternative outlets, making disposal of biodegradable waste less attractive. The risk of illegal activities by waste producers or waste collection companies wishing to avoid recycling and disposal costs must be counteracted.

In successful jurisdictions there is strong leadership at central government level, and rigorous enforcement at local level.

10.2 MECHANISMS TO DRIVE THE STRATEGY

The Strategy requires a rapid expansion in recycling, biological treatment and residual treatment capacity. To facilitate this the following mechanisms will be used:

Promotion of Separate Collections – requires application of waste regulation, mandatory treatment methods, the use of colour coding and other presentation protocols which support source separation, employing use-related or differentiated charges, and comprehensive promotion and public awareness schemes.

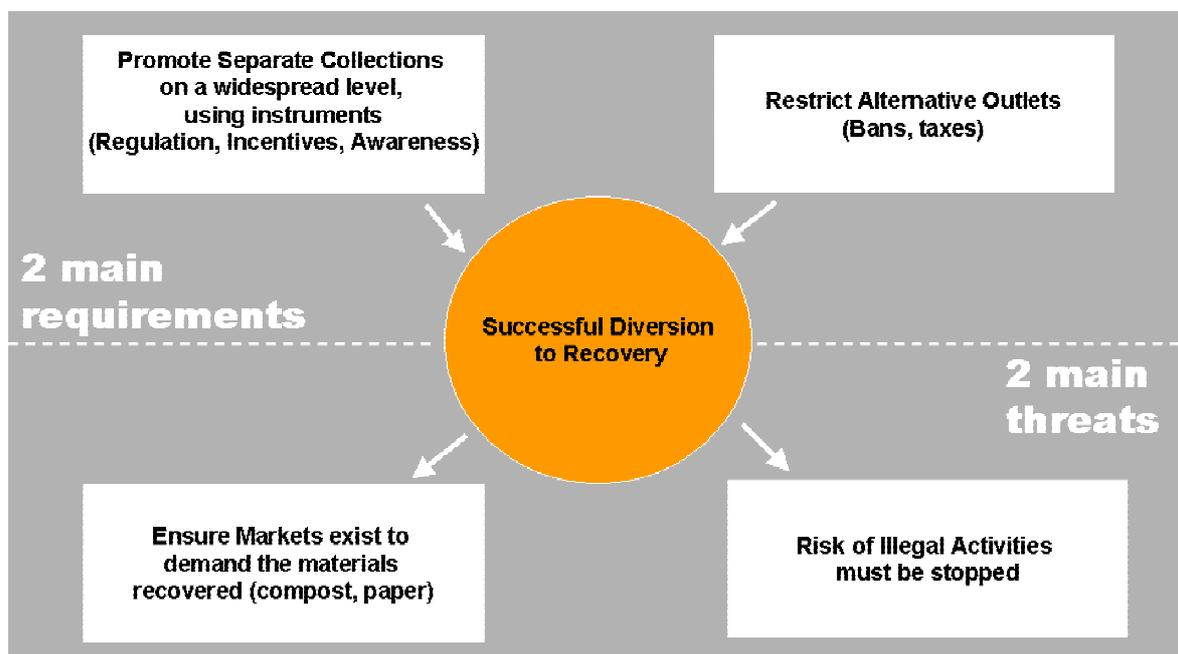
Restricting Disposal Outlets – the continued use of the landfill tax, and introduction of new regulations preventing collection of mixed waste for target materials

Restricting Illegal Activities – enforcement of regulation and better awareness measures to prevent 'black disposal' of waste by for example dumping, burning and disposal to foul sewer

Developing Markets – taking a range of initiatives to support the growth of a market for compost, based on product quality and consumer awareness

Producer Responsibility Mechanisms – extending the role of industry and product producers in reducing and recycling biodegradable waste.

These implementation of these mechanisms is described in more detail in the succeeding chapters.



11 ACTION PLAN FOR SEPARATE COLLECTIONS

Previous chapters have underlined the importance of successful source-separation schemes for the key waste streams of paper/ cardboard, green waste and food waste. A series of tools need to be applied to reinforce and develop these collection systems.

11.1 WASTE COLLECTION PERMITTING SYSTEM

Local Authorities can use the Permitting system established by the Waste Management (Collection Permit) Regulations 2001 to introduce separate collection policies in a uniform manner across their functional area. This relates to both household and commercial waste collection. Guidance has been issued to local authorities by the DOEHLG (Circular WIR 05/04) to assist local authorities in implementing these aspects of the Collection Permits.

Already a number of local authorities (for instance in the North-East and Connaught Regions) have set conditions on waste collection companies towards segregation of household packaging and paper materials, with a gradual lead in period.

The collection permit should include details of:

- the specific target materials (and those not acceptable)
- the collection frequency
- the type and colour of container acceptable
- details of presentation (any specific precautions against litter etc.)
- information and promotional requirements

The permitting system should enable competition among waste collection companies while ensuring that householders and businesses have a clear and consistent pattern to adhere to. Inter-regional co-operation is recommended in order to facilitate a consistent approach. Advance consultation with waste collection companies and the public will facilitate a smooth implementation. Local authorities involved in waste collections should implement the same collection conditions as private collectors.

11.2 WASTE BYE-LAWS

Bye-laws governing waste presentation should be adopted locally in support of separate collection schemes, placing an obligation on the waste producer (householder or business) to comply with the local collection system. Bye-Laws should spell out:

- What recyclable materials have to be separated
- Details of what container type/ colour is acceptable
- Timetable/ frequency for presentation of the material

Bye-laws need to be introduced in parallel with the collection systems outlined in the Waste Collection Permits. The existence of new Bye-Laws for waste need to be brought to the attention of the residents or businesses, and enforced by local authorities. Sanctions should be specified within the Bye-Law and will typically include an initial caution and/or penalty and the subsequent refusal to collect non-conforming bins. Other systems may be required, reference to methods used in litter enforcement may be applicable.



Waste Collection Permits to regulate are central to implementing separate collection

11.3 COLOUR CODING OF WASTE RECYCLING COLLECTIONS

In Ireland there is to date no standard colour scheme for waste streams, in contrast to most of our European neighbours. Such an approach

- facilitates the public in matching the bin with the waste stream
- makes advertising of recycling more cost effective
- facilitates people moving from one area to another, and

- aids in raising overall awareness of recycling.

The following system is proposed as a National Standard series of colours for all waste recycling containers. This follows broadly from European practice.

Figure 11.1 – National Colour Scheme for Recycling collections

Material	Colour
Paper	Blue
Packaging /Dry Recyclables	Green
Food & Garden Biowaste	Brown
Plastics	Yellow
Residual (Mixed) Waste	Black/ Dark Grey
Household Haz. Waste	Red

Switching to the new colour scheme may create some difficulty in areas where existing coloured bins are in place. The scheme chosen is already in place in some of the main schemes (Dublin City, Galway).



Galway City Council services 18,000 customers in a 3-bin system: residual, dry recyclables, and organics

11.4 USE-RELATED (DIFFERENTIATED) CHARGES

The optimum charging mechanism for waste will reward those who produce less waste and those who separate waste into recyclable fractions. There is general support for such a system among the public, and it can reinforce policies for reduction, source separation and recycling of wastes.

The introduction of use-related charges (e.g. through a 'pay-by-weight' or 'pay-by-volume' mechanism) is more equitable when the alternatives to disposal – i.e. good recycling collections and convenient drop-off points in the form of recycling centres – are already in place. Upon introduction of use-related charging the materials can be diverted to the recycling system.

Policy in relation to use-related charges – “pay as you throw” - is outlined in Chapter 6.

11.5 PROMOTION OF SEPARATE COLLECTION SCHEMES

The level of public awareness and motivation about recycling collections will determine to what extent they participate in the new services. The roll-out of new waste collection schemes and recycling facilities is most successful when accompanied by a focussed public awareness campaign. The aim is to result in a collection scheme with a high degree of participation and low levels of contamination.

When implementing new facilities and collection schemes, an information programme should be drawn up to meet the following requirements:

- to reach a broad audience in the catchment area,
- to develop an appreciation of the need for the scheme,
- to demonstrate the commitment of the local authority
- to ensure an understanding of what materials are targeted, and what materials are excluded
- to clearly outline the mechanics of the scheme (times/ dates/ locations etc..)
- to deal with queries from the public and act upon feedback
- to provide ongoing information back to the system users during the operational phase, to maintain motivation levels

Examples of successful public awareness campaigns are available in Galway City, where the City Council established dedicated 'green teams' to drive the implementation of the 3-bin collection system (18,000 households). The Green Teams were staffed with 12 temporary officers who visited households along collection routes as the new collections were rolled out, imparting information and responding to customer concerns.

In County Kerry, the local authority has developed its own branding and logo for its recycling collections ('Ecosense'), and used a variety of local media and advertising techniques to stimulate interest and involvement. Several private sector companies have also rolled-out new collection schemes employing effective information campaigns.

It is recommended that private companies co-operate closely with the local authorities prior to launching new schemes, and agree on details of public information and awareness.



*Promotion and Information Updates by Kerry
County Council*

12 RESTRICTING ALTERNATIVE OUTLETS

12.1 PREVENTING ILLEGAL ACTIVITIES

With a changing waste management system and recent escalation in costs, there may be a temptation to persist with 'black disposal' – i.e. using illegal or un-regulated forms of waste management. These routes typically create serious environmental pollution and undermine the financial footing for authorised facilities and collections.

Therefore the illegal and unauthorised waste disposal channels need to be eliminated in order for this Strategy to be successful.

As well as the regulation proposed below, public awareness needs to be improved such that illegal waste disposal becomes socially unacceptable.

Under the Protection of the Environment Bill 2003 the Office of Environmental Enforcement was established which provides the EPA with additional powers to tackle environmental offenders. These additional powers enable the EPA to audit the performance of local authorities in carrying out their environmental enforcement functions, and to monitor compliance by local authorities with their environmental obligations.

These new powers also allow the EPA to increase fines, to presume that landowners are complicit in illegal dumping activity, and to request that courts have regard to any environmental remediation required in determining fines for environmental offenders.

The Office of Environmental Enforcement works closely where necessary with the National Bureau of Criminal Investigation, the Criminal Assets Bureau, the Office of the Director of Corporate Enforcement and, where appropriate, with the Gardaí.

12.1.1 Illegal Dumping

Local authorities are responsible to implement laws concerning illegal dumping and littering, using powers under the Waste Management Act and the Litter Pollution Act.

In addition to local authority regulation, it is expected that the EPA's Office of Environmental Enforcement will assist in counteracting large-scale illegal dumping activities.

12.1.2 Backyard Burning

Illegal disposal of waste by burning is now a common practice in many households – particularly in rural areas. Paper, cardboard and other biodegradable fractions are burned, along with plastics and other wastes.

Illegal burning provides an 'alternative outlet' and hence works against the goals of this strategy which is towards separate collection and recovery of biodegradable waste. Waste burning is also a significant form of pollution, being the largest single source of dioxin emissions to air in Ireland. A general obligation already exists under the Air Pollution Act, 1987 (Section 24(2)), not to create an air pollution nuisance.

A new regulation clearly prohibiting the burning of municipal waste will be adopted under the Waste Management Act, 1996. This initiative will facilitate more straightforward enforcement and awareness measures by local authorities.

12.1.3 Disposal of organic waste to foul sewer

In-sink macerator units for organic kitchen waste are used in some household and commercial premises as a means of waste disposal.

While it may be attractive for the user – enabling waste charges to be avoided - it transfers the problem of waste treatment to the local wastewater treatment plant, which has not been designed to handle food waste. This practice is less sustainable than separate collection and biological treatment, since it risks creating water pollution and the value of the material is lost.

A regulation banning the disposal of food waste to foul sewer and the use of in-sink food waste disposal units will be brought into force, with possible exceptions for areas where the gradient of the existing sewer system is marginal.

12.2 RESTRICTING WASTE DISPOSAL

Presentation of mixed waste for collection and disposal is still the dominant method of waste management. Successful initiatives regarding packaging wastes confirm that a combination of regulatory and economic instruments can speed up the transition to a 'separate collection' system.

12.2.1 Disposal Levy

The landfill levy (currently €15/ tonne) will continue to be used to make waste diversion more financially attractive. The level of taxation will be reviewed to help maintain a gap in the gate fees between more sustainable options (e.g. composting) and landfills.

12.2.2 Restriction on the collection of mixed waste

The Waste Management (Packaging) Regulations 2003 introduced an obligation on all commercial outlets to separate certain packaging waste (incl. paper, cardboard, and wood), and banned the disposal of these to landfill. Similar measures for biodegradable waste fractions will be implemented on a phased basis, in tandem with the expansion in collection and recovery capacity. Target materials include:

- Commercial paper (office paper etc.)
- Green waste (from both households and businesses)
- Food waste produced at large-scale commercial outlets (e.g. supermarkets) and from large kitchens/ canteens
- Textiles

Such policy measures enable waste collection companies to plan and develop collection systems in co-operation with clients. They also provide a clear policy direction and a clear instruction to the waste producer.

A combination of enforcement measures must be operated by the local authority:

- Inspection of waste collection companies and enforcement via the Waste Collection Permit
- Ensure the accuracy of all Annual Environmental Reports (AERs) supplied by waste collection companies
- Inspections at waste transfer stations and landfills
- Inspection and enforcement of the waste producer's premises
- Inspection of waste that has been presented for compliance with regulatory restrictions and Bye-laws

13 MARKET DEVELOPMENT

13.1 ACTION PLAN FOR MARKET DEVELOPMENT

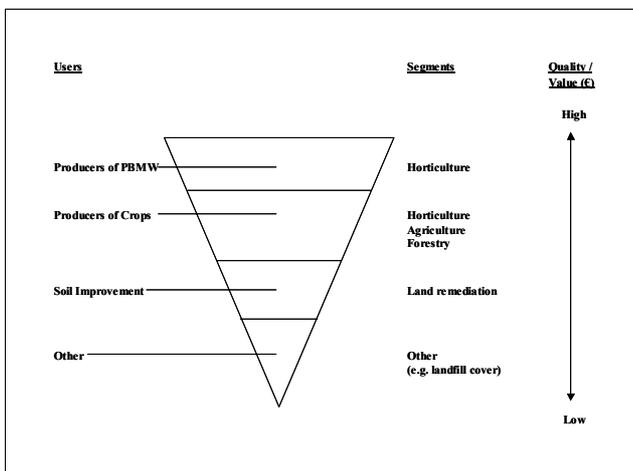
Development of markets for the recovered biodegradable municipal waste is a critical element of the success of this Strategy. The end goal is a situation where market demand is strong and revenues are achieved that offset the costs of collection and treatment of waste. This can be achieved by the waste management industry and the public sector in a partnership approach.

13.2 COMPOST MARKETS

13.2.1 Assessment and Evaluation of Outlets

A Report entitled “Assessments and Evaluation of Outlets of Compost Produced from Municipal Waste” was published in 2002 by the EPA (ERTDI programme under the 2000-2006 National Development Plan). This report contains a series of strategic recommendations in support of sustainable markets for compost.

The Report recommends adopting a ‘Hierarchy’ for compost utilisation, aiming for high quality product linked to a high revenue market.



‘Hierarchy’ approach to compost markets

The Report identifies a range of potential market outlets for compost, and outlines a possible scenario for what quantity of waste could be sold to each market (Table 13.2 overleaf).

The actions of this Strategy draw from the EPA report and assign a responsibility and implementation programme.

Table 13.1 - Summary of Recommendations from EPA ‘Outlets’ Report (Van der Werf et al).

<p>Quality of the compost product</p> <ul style="list-style-type: none"> • Collect only source separated BMW for composting • Develop Irish compost quality standards • Develop process management at composting facilities and improve market awareness among operators • Improve knowledge among consumers of the meaning of the quality standards
<p>Improve Economic Value:</p> <ul style="list-style-type: none"> • Target specific end-use markets, specifically higher end uses (horticulture) • Assign a monetary value to the product (rather than giving it away free) • Profit from ‘product sale’ as well as gate fee • Strive to produce a higher quality, market-oriented product
<p>Outlet Development</p> <ul style="list-style-type: none"> • Develop a government procurement policy • Local or regional procurement policy • Government horticultural peat replacement policy
<p>Marketing Strategies</p> <ul style="list-style-type: none"> • Certification Programme for compost • Develop handbook to assist operators prepare a Marketing Plan • Develop a marketing plan prior to developing a facility • Work with the related industries (Peat industry, Horticulture, Agriculture, organic farming, and Mushroom Industry, Land Remediation, and Forestry) to develop compost uses and foster market awareness
<p>Promotion and Education</p> <ul style="list-style-type: none"> • Develop promotion and education programmes for consumers (incl. general public) • Develop promotion and education programmes for producers of compost

13.2.2 Government-Led Initiatives

Irish Compost Quality Standards

The NSAI, in association with the DOEHLG and the industry will establish a set of National Compost Quality Standards. These will be largely based on the Draft EU Biowaste Directive and will be introduced following a period of consultation. The

standards will specify the maximum permissible concentration of various potential contaminants for each class of compost (Class 1 compost, Class 2 compost etc.). The possibility to link compost end-use with the specific classes of compost will be explored.

Peat Replacement Policy – Producer Responsibility Initiative

The Department of Environment, Heritage and Local Government (DOEHLG) will seek to enter dialogue with the Peat Industry (and the Retail Sector) towards a voluntary industry initiative that will introduce peat extenders into horticultural compost products. Such a voluntary approach has been industry led in the United Kingdom where public pressure to reduce peat extraction was the motivating force. Inclusion of compost as a peat extender will require a very consistent and high quality compost to be produced from municipal green waste and biowaste.

Development of Horticultural, Agricultural and Forestry Markets

Use of compost in conventional agriculture is a vast potential market, where even a small degree of penetration will create a significant and stable demand for compost. Developing farmer confidence and know-how in relation to compost is therefore essential.

The DOEHLG in co-operation with the Department of Agriculture (and its Agencies) will develop guidance documents and confidence building measures to support the use of compost in agriculture. Examples of initiatives include:

- Guidance and Information on Compost Use and practicalities
- Defining Application Rates and Codes of Practice for compost use (as per municipal biosolids), while taking into consideration provisions of the EU Nitrates Directive (91/676/EEC) and the Water Framework Directive (2000/60/EC) along with other statutory Instruments relevant to land application and environmental protection.
- Growing trails in various market sectors
- Demonstration projects

Public Sector Procurement Policy

The DOEHLG will co-ordinate the development of a procurement policy whereby waste-derived compost can be used in suitable public sector projects. Such a measure will help accelerate the development of markets especially in the initial years of expansion of composting capacity. This policy will be implemented on a pilot level in a dedicated region initially.

The Connaught Region is suggested for this purpose since there are two biowaste composting plants already in operation, and a Regional Waste Management Co-ordinator is in place.

This process will identify the type of capital works projects where compost could replace other materials purchased, and what grades and types of compost can be usefully applied in different schemes.

The recent guidance note issued by the Government Contracts Committee on “Environmental Considerations in Public Procurement” (GCCC 04/04) will assist local authorities in assisting market development for compost.

Table 13.2 - Estimates of potential outlets for compost*. (Taken from EPA ‘Outlets’ Report (Van der Werf et al)).

Sector	Estimated potential outlets (t/a)	Rationale (abbreviated)
Horticulture	55,000	20% of existing horticulture peat and bark compost usage
Agriculture	250,000	3% of crop land annually
Conventional		
Organic Farming	64,000	10% of Organic land annually
Land remediation	-	To be determined
Contaminated Lands	-	To be determined
Bogland restoration	20,000	
Forestry	40,000	10% of forestry land annually
Export	18,750	Assumes 5% of 375,000 t of horticultural peat exported annually
Total	447,750	

Estimated figures naturally apply to potential markets for a quality compost product.

13.2.3 Industry-led Initiatives

Compost Quality Assurance Scheme

A Quality Assurance Scheme is a market-oriented step that goes beyond the adoption of National Compost Quality Standards. The aim is to prove to potential buyers that the product has been independently verified as coming from a process that has produced a bona-fide and high quality

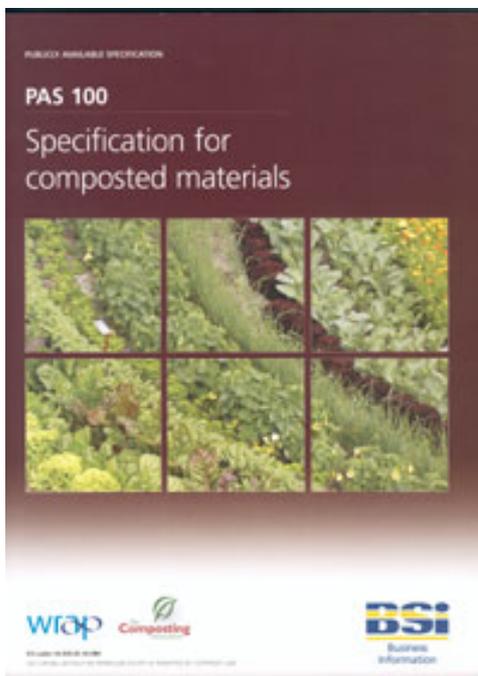
material that will deliver the purpose it is intended for. Experience shows that market-driven quality schemes can have a positive impact on collection and treatment of organic waste as well as the end-product itself.

The Composting Association of Ireland (Cré Teo.) is investigating the option of establishing a Compost Quality Assurance scheme. The DOEHLG will support the development or adoption of a Quality Assurance scheme. Numerous models exist for operation of such a scheme. The scheme should be self-financing once established.

Model Procurement Handbook for compost

This will entail a simple handbook containing a 'model specification' for those wishing to purchase compost for various uses. It will facilitate both buyers and producers, and would be particularly useful as an immediate measure, where market knowledge of compost is relatively low and there is no Quality Assurance scheme in operation. This would be aimed more towards private companies not bound by public procurement procedures.

It is recommended that the Composting Association of Ireland lead the development of such a guide, with support of the DOEHLG and the Environmental Protection Agency in its development and dissemination.



The UK composting industry has adopted a quality assurance scheme, which was developed by the UK Composting Association, funded by WRAP the government recycling development agency

Marketing Plan Guidance

The EPA Outlets report identified a need for market plan preparation by existing and new composting facility operators. A guidance note in this regard would be a useful tool for the industry and it is recommended that the industry should lead the implementation of this initiative which is essentially designed for its members. Support will be forthcoming for such measure from the DOEHLG and related government Agencies.

13.2.4 Publicity and Information Initiatives for Compost

High levels of awareness and motivation towards composting will benefit source separation schemes and ultimately lead to better quality compost products, in greater volumes. Better awareness will also help expand the market for compost. Responsibility for improving public awareness in relation to compost and composting is a shared responsibility.

There is a direct benefit to the biological waste treatment industry from improving public awareness, and ongoing initiatives are required from composting and AD sectors.

Local Authorities, the EPA, ENFO and other government bodies will continue to promote awareness and consumer demand for compost through its ongoing programmes and initiatives.

Table 13.3 - Summary of Compost market Development Actions

Instrument	Responsible Body	Time-frame
Adopt National Compost Quality Standards	DOEHLG	2004
Market Development in Agriculture and Forestry (R&D and Dissemination)	DOEHLG, DOA, Teagasc, EPA,	2004-2007
PRI for Peat Extenders	DOEHLG/ Peat Industry	2004
Government Procurement Policy	DOEHLG Connaught region (pilot) National	2004 2005
Procurement Handbook	Cré/ IrBEA	2004
Compost Quality Certification Scheme	Cré/ IrBEA	2004 develop 2005 implement
Marketing Plan Handbook	Cré/ IrBEA	2004

13.3 MARKETS FOR PAPER AND CARDBOARD

A Market Development Group will be set up under the guidance of the DOEHLG to develop existing markets for recyclables and to identify new applications and markets for recyclables and secondary recycled products. This group will identify barriers to the use and marketing of recyclable materials and make recommendations to address these.

The Market Development Group will be a focused group and comprise representatives from the EPA, Enterprise Ireland, the National Standards Authority of Ireland and representatives of business and industry interests, as well as the Departments of Enterprise, Trade and Employment.

Enterprise Ireland will focus specifically on those areas which are identified as having the greatest potential. The National Standards Authority of Ireland will be responsible for the development of standards and guidance on the use of secondary raw materials in design and manufacture.

Initially the main focus will be on non-glossy paper, wood and plastics. Further forms of biodegradable waste including glossy papers will also be addressed. This governmental initiative is similar to other groups such as WRAP, and REMADE set up to stimulate market development for recyclable materials by Great Britain and Scotland respectively.

13.4 PRODUCER RESPONSIBILITY INITIATIVES (PRIS)

In keeping with the Polluter Pays Principle, the Irish Government has promoted the introduction of PRIs to facilitate better management of priority waste streams such as Packaging and Farm Plastics. Further initiatives are emerging for Construction/ Demolition Waste, Waste Electrical and Electronic Equipment, and newspapers and magazines.

The PRIs typically emerge as voluntary agreement established with the approval of the DOEHLG, sometimes with legislative backing to promote full compliance of all companies.

Further Producer Responsibility Initiatives will be implemented in the following sectors in support of biodegradable waste minimisation and diversion:

- **Newspapers and Magazines** – forming a substantial proportion of household waste, a policy is required that assists the collection and recovery of these products at post-consumer level. This will build upon initiatives underway at retail level
- **Telephone Directories** –publishers of these directories have taken voluntary

steps to improve information on recycling outlets – the last page of each directory includes information on where it can be recycled locally. Further progress in support of collection and recovery is required

In the absence of a voluntary agreement, the DOEHLG will consider introducing regulations and/or environmental levies, the revenues of which should be used towards the attainment of specified environmental objectives and targets in these areas.

As the implementation of PRIs progresses further initiatives will be considered for other relevant elements of BMW, such as Junk Mail and other forms of 'direct marketing', and textiles/ clothing.

14 IMPLEMENTATION AND MONITORING

14.1 ROLES AND RESPONSIBILITIES

Implementation of this Strategy will be led and co-ordinated by the Department of Environment, Heritage and Local Government. Responsibility for putting the objectives into action is shared between many stakeholders:

Table 14.1 - Roles and Responsibilities

Body	Role
Local Authorities	<p>Prepare and implement Waste Management Plans</p> <p>Issue waste collection permits (incl. separate collection conditions)</p> <p>Collect waste data (from collectors and permitted facilities) and report this to EPA</p> <p>Co-ordinate and undertake public awareness measures</p> <p>Enforce regulations (incl. Preventing illegal dumping. Burning etc.)</p> <p>Establish or participate in the establishment of new facilities (recycling centres, composting plants etc.)</p>
Waste Collection and Management Companies	<p>Implementing new waste collection systems (incl. separate collections and use-related charges),</p> <p>Establishing expanded recycling and recovery facilities</p> <p>Establishing or accessing residual waste treatment options</p> <p>Investment in new facilities</p> <p>Reporting information to local authorities and the EPA</p>
Environmental Protection Agency	<p>Preparing the National Waste Database Report</p> <p>Implementing National Waste Prevention policies</p> <p>Role in raising awareness and disseminating information</p>

Individuals and Businesses	Separation and presentation of recyclable waste streams in accordance with instruction
Umbrella Groups	<p>Represent views of stakeholders such as composting or AD industry, Non Governmental Organisations etc.</p> <p>Role in raising awareness and disseminating information, and motivating improved performance</p>
Voluntary Recycling Sector	Collection and Reuse/ Recycling of materials such as textiles (clothing), books etc..
Other Government Departments and Agencies	<p>Department of Agriculture – implement Animal By-Product Regulation, and role in cross-sector schemes (e.g. on-farm biological facilities, use of compost in agriculture).</p> <p>Teagasc – can play an important role in developing compost markets.</p> <p>BIM – interactions between municipal waste and fisheries wastes.</p>

14.2 IMPLEMENTATION BODY

A Strategy Implementation Steering Group will be established to co-ordinate the implementation of this Strategy. The Steering Group will comprise a cross section of the stakeholders in the biodegradable waste management industry. Representatives will include:

- Department of Environment, Heritage and Local Government
- Local authorities
- Department of Agriculture and Food
- EPA
- Teagasc
- Waste Collection and Recovery Industry

A number of umbrella groups representing various stakeholders in the waste management sector have participated in developing this strategy. These include;

Cré – The Composting Association of Ireland

IrBEA – Irish Bio-Energy Association (who play a role in developing Anaerobic Digestion facilities)

IWMA – Irish Waste Management Association, an umbrella group for private waste collection firms

BIM – Bord Iascaigh Mhara, who are exploring biological treatment options for residues from the fisheries industry

The Strategy Group will also continue to liaise with representatives of these and other sectors such as the paper and packaging industry, the hospitality industry, the retail industry and the voluntary sector which operates extensive recycling and reuse systems for textiles and other waste streams.

14.3 ROLE OF THE IMPLEMENTATION BODY

The functions of the Strategy Implementation Steering Group will include:

- Monitoring success of implementation vis-a-vis the key performance indicators.
- Reporting progress to the Minister for the Environment and the EU Commission.
- Co-ordinating Market Development Initiatives, including cross sector co-operation with Agriculture, Forestry, marine sectors etc.
- Monitoring implementation and success of Economic and Regulatory instruments under the Strategy
- Review and development of the Strategy at regular intervals
- Recommendations to DOEHLG on the following matters
 - Public information campaigns
 - Market development programmes
 - Requirement for waste regulations and enforcement measures
- Arranging for success stories in exemplary biodegradable waste management to be documented as case studies and widely disseminated.

14.4 KEY PERFORMANCE INDICATORS

The success of implementation will be measured against the rates of recycling and recovery for various materials, and ultimately the amount of BMW sent to landfill.

A number of simple performance indicators are set out in Table 14.3 overleaf, outlining current performance and future targets. Most of these will be reported regularly by the EPA in their National Waste Database publication. Performance can also be monitored on a regional or local authority level. Certain data – for example the extent of participation in home composting and the level of performance achieved – may need separate surveys.

Table 14.2 Summary of Instruments and Initiatives Proposed

Instrument	Responsible Body	Timeframe
Landfill Tax	DOEHLG	Ongoing, annual review
Regulations banning materials from mixed collection and landfill	DOEHLG	Office Paper_2004 Green Waste_2005 Food Waste_2006
Producer Responsibility initiatives	DOEHLG	Agree PRI with relevant sectors by end 2004
Ban on illegal burning, and in-sink disposal	DOEHLG – legislation Local Authorities - enforcement	Legislation in 2004
Waste Collection Permits	Local Authorities/ Regions	Review Permits in 2004 setting targets for separate collection schemes
Waste Bye-Laws	Local Authorities	Draft Bye-Laws in 2004 that support Waste Collection Permit changes
Colour Coding of Recycling Containers	Local Authorities/ Regions	Introduce in 2004 and include in Collection Permit review and Waste Management Plan reviews.

14.5 IMPROVING AVAILABLE INFORMATION

Developing and implementing any strategy requires accurate and up to date information to be available. In drafting this strategy, a number of 'information gaps' were identified which waste management contractors and local authorities should strive to improve.

The reporting system established under the Waste Collection Permit system is only in its second year of implementation, therefore significant improvement in reporting by waste contractors is expected in the coming 12 months.

Areas where both public and private sector require to improve data collection and reporting include:

Home composting Schemes: As well as recording numbers of bins supplied and their costs, local authorities should maintain a list of customers and carry out follow up surveys of participation in home composting.

Separate Collection Schemes and Materials Recovery Facilities: All operators should record, at least, the number of customers involved and total quantity of type of material collected. Ongoing surveys of composition and contamination levels are advised. Composition breakdown can be calculated on the output of materials over a specific period, based on weighbridge records, as well as sorting of incoming loads.

Biological treatment - For separate collections of food and garden waste, the degree of contamination should be recorded. Information on compost quality and end-use markets for compost is also very important.

Recycling and Civic Amenity Facilities - total quantity of each material should be recorded, as well as customer numbers etc..

Waste Collection Services – ongoing waste composition surveys in accordance with EPA requirements for the national waste database programme should be carried out. The amount of biodegradable waste, and the percentage of various recyclable fractions in mixed waste is very important in judging progress in relation to the Strategy targets.

14.6 RECOMMENDATIONS FOR FUTURE WASTE PLANNING

When policies and targets of the various Regional Waste Management plans are combined into a national picture, they generally reflect ambitious policies for diversion of waste away from landfill, based on the EU Waste Hierarchy.

Certain issues need to be addressed in future reviews, to facilitate implementation of this Strategy:

- Revision of waste generation data and waste growth projections to reflect recent population and economic expansion: this is likely to increase treatment capacity requirements (for recycling, biological treatment and residual waste treatment).
- Less rigorous specification of waste recovery facilities: rather than define the exact location, number and capacity of recycling (including waste recycling centres) and biological treatment facilities, the Plans should enable greater flexibility for additional recovery capacity to be provided within a region. Such an approach should enable greater competition among facility operators and a more robust set of recovery facilities in the region.
- Waste collection systems and in particular separate collection schemes should be streamlined and made consistent within the regions in accordance with recommendations in this Strategy.

Each Waste Management Plan should meet the targets of this Strategy, identifying the combination of collections and treatment types that suit local conditions and objectives. Each Plan should be reviewed on that basis.

Table 14.3 – Performance Indicators for Monitoring Strategy Implementation

Indicator (all data in tonnes)	Status 2001	Target 2006	Target 2009	Target 2016
Total BMW produced	1,698,134	2,098,384	2,342,432	3,046,902
Total BMW Diverted				
• Amount	218,538	814,109	1,772,551	2,646,286
• %	13%	39%	76%	87%
Total BMW Landfilled	1,257,420	1,284,275	569,881	400,616
Home Composting	10 % of suitable households	25% urban households 60% rural households 65,053	73,249	94,459
Textiles Reuse and Recycling	5 % reuse/ recovery 4,044	20% reuse/ recovery 14,337	40% reuse/ recovery 32,651	50% reuse/ recovery 52,043
Recycling Paper and Cardboard				
• Tonnage recovered	166,305	389,455	673,430	1,073,749
• % Recovery rate	21 %	43%	55 %	67%
Biological Treatment				
• Tonnage treated	22,233	164,270	351,539	652,908
Residual Waste Treatment				
• Total	30,000*	180,993	641,681	762,316

*Projected quantities are based on a 3.8% per annum waste growth. * estimated for 2001*

Abbreviations

AD	Anaerobic Digestion
AER	Annual Environmental Report
BIM	Bord Iascaigh Mhara
BMW	Biodegradable Municipal Waste
Cré	The Composting Association of Ireland Teoranta
DOA	Department of Agriculture
DOEHLG	Department of Environment, Heritage and Local Government
EPA	Environmental Protection Agency
ERTDI	Environmental Research Technological Development and Innovation programme
GDP	Gross Domestic Product
IPC	Integrated Pollution Control
IrBEA	Irish Bio-Energy Association
MBT	Mechanical Biological Treatment
PAYT	Pay As You Throw
PPP	Public Private Procurement Policy
PRIs	Producer Responsibility Initiatives
TPA	Tonnes per annum (also tpa)

Glossary of Terms

Aerated Systems: controlled composting systems with optimum aeration conditions ensuring aerobic conditions exist for decomposition of biowaste.

Anaerobic Digestion: the biological decomposition of biowaste in the absence of oxygen and under controlled conditions in order to produce biogas and digestate.

Biodegradable Content: the percentage content of waste which is biodegradable. For municipal waste this usually fluctuates around 60%-70%.

Biodegradable Municipal Waste (Biowaste): municipal waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard.

Biological Treatment: involves composting, anaerobic digestion, mechanical/ biological treatment or any other process for stabilising and sanitising biodegradable waste.

Bring Banks: these are facilities in which members of the public deposit recyclable waste materials such as paper, glass, green waste and plastics in material specific receptacles for subsequent collection and delivery to material recovery facilities.

Central Composting Facility: a facility at which the biodegradable waste is delivered to be processed by composting into a compost product – can be for green (garden waste) food waste or a combination of both materials.

Civic Amenity Sites (also called Recycling Centres): a reception facility that enables householders to deposit a wide range of household waste including recyclable and non-recyclable materials, bulky household waste and certain categories of household hazardous waste

Co-Incineration: involves plants where waste is used as a fuel or is disposed of at a plant along with other substances where energy generation or production may take place.

Collection System: a system of gathering, sorting or mixing of waste for the purpose of it being transported to a waste recovery or disposal facility.

Commercial Waste: waste from premises used wholly or mainly for the purposes of a trade or business or for the purposes of sport, recreation, education or entertainment but does not include household, agricultural or industrial waste.

Community Composting Facilities: facilities set up, whereby local communities can become involved in the management of their own wastes, whilst implementing the proximity principle and increasing awareness of waste recycling practices within their own community

Compost: the stable, sanitised and humus-like material rich in organic matter and free from offensive odours resulting from the composting process of separately collected biowaste.

Composting: the autothermic and thermophilic biological decomposition of separately collected biowaste in the presence of oxygen in order to produce compost.

Compost Quality Standards: are usually statutory in nature and designed to regulate potentially harmful aspects of compost production and use, and thereby protect the environment and human health.

Digestate: the material resulting from the anaerobic digestion of separately collected biowaste.

Government Contracts Committee: this committee assists the Department of Finance in formulating overall policy on public procurement. It is made up of senior officials in the higher spending Departments and is chaired by a Department of Finance representative. The committee also adjudicates on contracts being awarded by Central Government Departments in certain cases.

Home Composting: a process whereby biowaste is composted and used in gardens belonging to private households.

Household Waste: the waste produced within the grounds of a building or self-contained part of a building used for the purposes of living accommodation.

Incineration: a process by which heat is applied to waste in order to reduce its bulk, prior to final disposal which may or may not involve energy recovery.

In-Vessel Composting: the composting of biowaste in a closed reactor where the composting process is accelerated by controlled and optimised air exchange, water content and temperature control.

IPC Licence: a licence granted by the EPA in accordance with the requirements of the Environmental Protection Agency Act, 1992 and the Environmental Protection Agency (Licensing) Regulations 1994 (S.I. No. 85 of 1994). The purpose of which is the protection of the environment and the protection of human, animal and plant life from harm or nuisance from certain industrial activities.

Kerbside Collections: entail waste collectors collecting a range of recyclable waste from outside private households, employing separate bins for the main waste streams (usually dry recyclables, organic waste, and residual waste).

Landfilling: the disposing of waste at a waste disposal facility used for the depositing of waste onto or under the land.

Landfill Directive: a Directive which aims to, by means of stringent operational and technical requirements on the landfilling of waste, to implement measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, ground water, soil and air, and on the global environment, including the green house effect, as well as any resulting risk to human health, during the whole life cycle of the landfill.

Landfill Levy: an additional environmental levy that is paid on top of normal gate fees by any private contractor or local authority that wishes to dispose of waste through a landfill site. The landfill levy is collected through landfill operators and forms part of a policy aimed at providing more incentives for re-use and recycling of waste.

Material Recovery Facilities: facilities where recyclables are sorted into specific categories and processed, or further transported to processors for remanufacturing.

Mechanical Biological Treatment: the treatment of residual municipal waste, in order to stabilise and reduce the volume of waste to be disposed off. A combination of mechanical processing and biological breakdown are employed.

Multi-Story Dwellings: dwellings consisting of numerous floors and occupied by more than one family.

Municipal Waste: waste from households, as well as commercial and other waste, which because of its nature or composition, is similar to waste from households.

National Climate Change Strategy: this Strategy provides a national framework for achieving greenhouse gas emission reductions by 13% above 1990 levels in-keeping with the EU target to reduce emissions by 8%, as part of the Kyoto Protocol of 1997.

National Waste Data Base Report: a national report that provides information on waste generation, waste management and waste infrastructure in Ireland.

Pay As You Throw Schemes: schemes where the fee charged for collection and disposal increases with the amount of waste collected from households. This provides a financial incentive for residents to reduce waste through reducing, reusing or recycling waste, which can in turn lead to lower transportation and disposal costs for local authorities and private waste collection companies. PAYT schemes may consist of pay per bag, pay per container, pay per volume or pay per weight.

Pay By Weight Schemes: schemes whereby resident's pay for the exact amount of waste collected per household. This scheme is devised to offer financial incentives for residents to reduce the amount of waste to be collected and disposed off by public or private waste collectors.

Polluter Pays Principle: the principle set out in Council Recommendation 75/436/Euratom, ECSC, EEC of 3rd March 1975 1(20) regarding cost allocation and action by public authorities on environmental matters.

Producer Responsibility Initiatives: a series of initiatives undertaken by the Government to facilitate better management of priority waste streams, in line with the 'Polluter Pays Principle'.

Quality Assurance Schemes: are usually non-statutory in nature, and designed to ensure that producers maintain process management and produce a compost product of high quality, which will be easily marketed and profitable in nature.

Recovery: any activity carried out for the purpose of reclaiming, recycling or re-using waste in whole or in part.

Recyclables: waste materials that may be subjected to any process or treatment to make it re-useable in whole or in part.

Recycling: the subjection of waste to any process or treatment to make it re-useable in whole or in part.

Residual Municipal Waste: the fraction of municipal waste remaining after the source separation of municipal waste fractions, such as food and garden waste, packaging, paper and paperboard, metals, glass and is usually unsuitable for recovery or recycling.

Separate Collection: the separate collection of biodegradable waste from municipal waste in such a way as to avoid the different waste fractions or waste components from being mixed, combined or contaminated with other potentially polluting wastes, products or materials.

Stabilised Biowaste: waste resulting from the mechanical/biological treatment of biowaste, unsorted waste or residual municipal waste which does not comply with specified minimum standards of environmental quality.

Thermal Treatment: a process by which heat is applied to waste in order to reduce its bulk, prior to final disposal. Thermal treatment can involve a number of processes such as incineration, pyrolysis and gasification.

Tradable Landfill Permits: are a flexible economic instrument, devised to minimise the cost of meeting the Landfill Directive targets whilst giving local authorities the greatest amount of freedom. An allowance to landfill a certain amount of waste is issued to the landfill operator – exceeding this amount requires the purchase of ‘spare’ allowances from other operators who have not used their full allowance.

Treatment Facilities: facilities where waste undergoes thermal, physical, chemical or biological processes that change the characteristics of waste in order to reduce its volume or hazardous nature or facilitate its handling, disposal or recovery.

Variable Charging (or Differentiated Charging): a method where local authorities determine waste disposal fees for various areas within its jurisdiction. These may consist of Pay As You Throw or flat rate fees for example.

Waste: any substance or object which the holder discards, or intends, or is required to discard, and anything which is discarded as if it were a waste, as per the Waste Management Act, 1996.

Waste Collection Permit System: a system whereby persons with a view to profit or otherwise in the course of business, collect waste are granted with a permit by a local authority in whose functional area the waste is collected.

Waste Management Facility: a site or premises used for the recovery or disposal of waste.

Waste Management Plans: statutory waste management plans implemented on a regional basis in Ireland since 2001.

Waste Minimisation: any technique, process or activity that either avoids, reduces or eliminates waste at its source, or results in re-use or recycling.

Waste Prevention: A reduction in the quantity and harmfulness to the environment of waste and the materials and substances contained within waste.

Waste Producer: a person whose activities produce waste or who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of waste.

Waste to Energy Plant: a plant where waste undergoes thermal treatment with a recovery of energy due to the fact that the waste itself contains large amounts of thermal energy ready to be liberated either by combustion or by synthesis gas production followed by combustion. The energy that is recovered is often used to supply electricity.

Windrow Composting: the composting of biowaste placed in elongated rows which are periodically turned by mechanical means in order to increase the porosity of the heap and increase the homogeneity of the waste.

