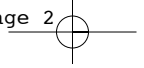




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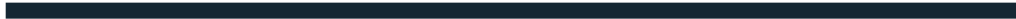


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Foreword



There has been great change in the management of waste in Ireland in recent years. We are increasingly becoming a Recycling Society. We see this in the growth in recycling each year. We see it in the reduction in the amount of waste going to landfill. We see it in successful producer responsibility initiatives, leading to improved recovery and recycling rates for packaging waste and waste electrical and electronic equipment.

While the progress to date is welcome, more can be achieved. In 2004, biodegradable municipal waste accounted for about 75% of the waste discarded at home or in the workplace. Ireland now has a challenging target to reduce the amount of biodegradable municipal waste going to landfill to just over 450,000 tonnes by 2016, or 35% of the amount produced in 1995. That will mean diverting about 80% of biodegradable municipal waste arising in that year. This looks a daunting task. But when the target of 35% for diversion of municipal waste from landfill by 2013 was set in *Changing Our Ways* in 1998, it looked beyond our reach. In 2004 that figure was nearly achieved, 9 years in advance.

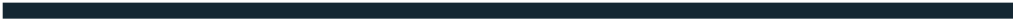
The National Strategy on Biodegradable Waste sets out a range of measures to meet our ambitious diversion targets. The key to success is for all involved – local authorities, the Environmental Protection Agency, waste operators, businesses and householders – to play their part in the successful implementation of the full range of integrated waste management options proposed in the Strategy document. Recycling of paper, cardboard and other materials in recent years has shown us what progress can be made. Now we need to aim even higher and increase recycling rates across the board as well as developing the necessary infrastructure for composting and residual waste treatment.

The Strategy was published in draft form initially and subject to a period of public consultation. Many comments and observations on the draft Strategy were received from individuals and organisations. I want to thank all concerned who took the time and made the effort to contribute to that process. I believe that we now have a more robust, coherent Strategy as a



result, one that will enjoy broad support in its implementation. The benefits that will flow from the full implementation of this Strategy - including a cleaner environment and lower greenhouse gas emissions - will be enjoyed by all. I ask you all to play your part in making this strategy a success.

Dick Roche, T.D.,
Minister for the Environment, Heritage and Local Government.



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 Government policy for the diversion of biodegradable municipal waste from landfill, building upon the key objectives established in policy documents *Changing Our Ways* (1998), *Delivering Change - Preventing and Recycling Waste* (2002) and *Waste Management: Taking Stock and Moving Forward* (2004).

1.2 WHAT IS 'BIODEGRADABLE' WASTE?

Biodegradable waste accounts for approximately three quarters of the municipal solid waste produced by homes and businesses and 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 Biodegradable Municipal Waste (BMW), which is produced largely by households and commerce. The principal 'biodegradable' components of municipal waste are paper and cardboard, food wastes and garden wastes.



1.3 REQUIREMENT TO DIVERT FROM LANDFILL

In 1999, a European Union Directive dealing with the landfilling of waste, commonly 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 restrictions on the consignment of certain waste materials to landfill. These restrictions include a gradual reduction in the quantity of biodegradable municipal waste which may be deposited in landfill sites.

Each Member State is obliged to take measures to implement the Landfill Directive targets. In addition, a National Strategy - setting out the proposed actions which will implement the biodegradable municipal waste landfill diversion targets - must be completed and submitted to the European Commission.

1.4 BENEFITS OF RECYCLING AND RECOVERY

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

- production and release of landfill gas, a potent global-warming gas, which is also odorous;
- generation of leachate, which must be collected and treated;
- slow rate of 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 the biological treatment of food and garden waste to produce compost, which can then be used to help grow new crops.

There is therefore significant benefit to be had from diverting biodegradable waste away from landfill and 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 – including the role of waste



management within the broader environmental context - 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. The *National Strategy on Biodegradable Waste* is consistent with these policies.

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 performance 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 waste sent to landfill

Developing biological treatment capacity of up to 300,000 tonnes per annum

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 34 city and county councils. Seven regional groupings emerged (Dublin, North-East, Midlands, Connaught, Limerick / Clare / Kerry, Cork, and the South-

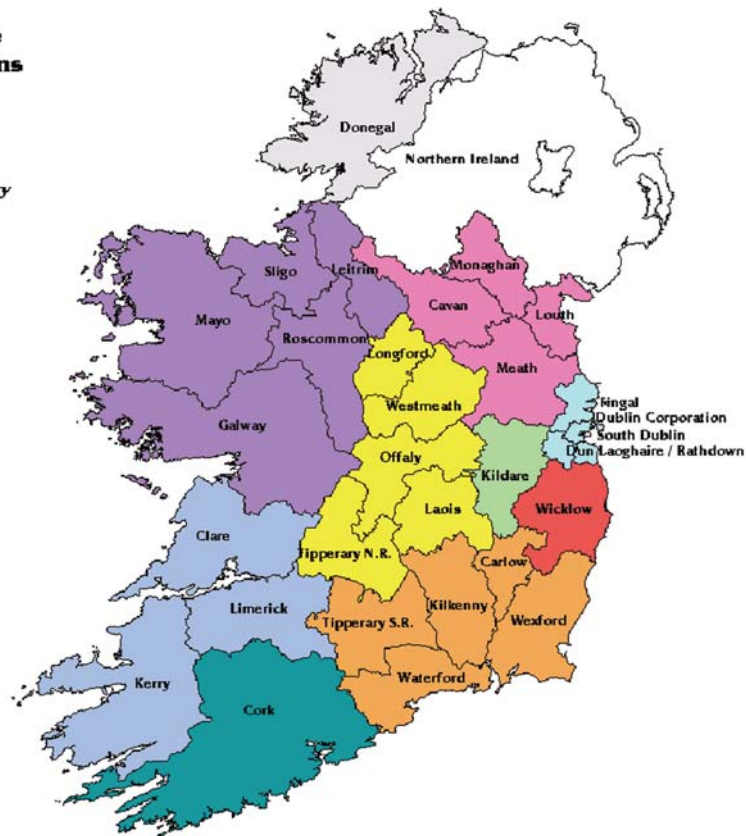


East), with three counties – Kildare, Wicklow and Donegal – preparing plans independently.

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*.

Regional Waste Management Plans

- Connaught*
- Cork*
- Donegal*
- Dublin*
- Kildare*
- Limerick/Clare/Kerry*
- Midlands*
- North East*
- South East*
- Northern Ireland*



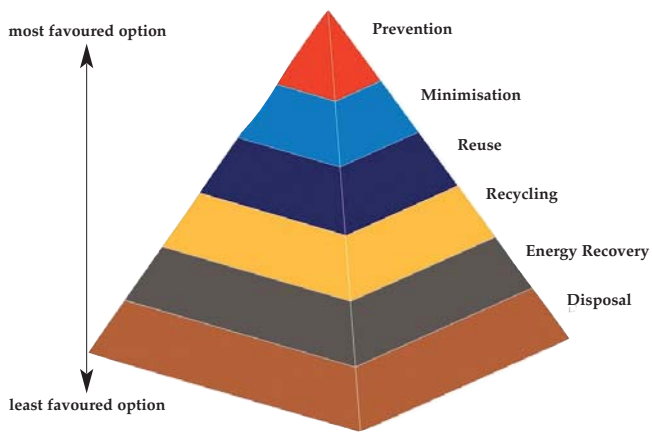
Delivering Change – Preventing and Recycling Waste (2002)

This Government policy statement was dedicated to the prevention and recycling of waste and focused on measures to reduce waste generation through the involvement of individuals, local authorities, businesses and industries. A number of new national initiatives were adopted to accelerate the pace of necessary change in societal behaviour, including:



- a proposal to establish a National Waste Prevention Programme, to be driven by a new Core Prevention Team based within the Environmental Protection Agency (EPA); and
- a proposal to establish a Recycling Consultative Forum and a Market Development Group to lead the expansion of markets for waste-derived materials.

Already progress has been made in developing industry-led initiatives. These are designed to deliver specific environmental targets and objectives through the implementation of effective, workable and least-cost arrangements by industry. The Government has also begun to introduce progressive bans on the landfilling of certain materials through legislation and local authorities have applied similar measures on a non-statutory basis in circumstances where viable alternative management outlets are available. A further objective is to develop the markets available for materials that are recovered from the waste stream here in Ireland and the Market Development Group has been established to assist in this process.



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

National Climate Change Strategy

When landfilled, biodegradable waste produces methane, a greenhouse gas which is 21 times more potent than carbon dioxide. Directive 99/31/EC on the landfill of waste progressively restricts biodegradable municipal waste landfilling to 35% of the quantity which was generated in 1995. Satisfactory



implementation of this obligation will make an important contribution to reducing the emission of greenhouse gases.

The *Proposal for a Landfill 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 organic waste is a cost-effective technique for decreasing methane emissions. The Strategy Paper outlined measures which could be undertaken to reduce the quantity of biodegradable waste which is consigned to landfills:

- waste prevention;
- waste reuse;
- material recycling / biological treatment;
- energy recovery.

The European Commission published a Study in December 2001, undertaken by AEA Technology, on *Waste Management Options and Climate Change*. 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, frequently exert a more dominant influence.

The EU 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 generation of greenhouse gases, compared with other options for the treatment of bulk MSW.

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



The *National Climate Change Strategy* was introduced in October 2000 and detailed the proposed measures to be taken by Ireland to limit the emission of global warming gases such as CO₂, methane, nitrous oxides and certain fluorinated gases from all sectors of the economy. Emissions from waste management activities are specifically identified in the Strategy. The 2005 *National Inventory Report* estimated that the waste sector created some 15% of all methane emissions and overall contributed 3% of all global warming gases produced in Ireland in 2003.

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).

Renewable Energy

Waste biomass encompasses not only the biodegradable fraction of municipal and industrial waste, but also the biodegradable fraction of products and residues from agriculture, forestry and related industries. Biomass also includes crops grown specifically for the production of energy.

Bioenergy is the general term used to describe renewable energy derived from biomass. Internationally, bioenergy is seen as a key energy resource within renewable energy policies and strategies for the future. The production of energy from biomass can contribute to:

- reduced dependence on fossil fuels;
- reduced level of greenhouse gas emissions; and
- stimulation of economic activities in rural areas.

The European Union has set an ambitious target of 12% in 2010 for the share of renewable energies in total energy and electricity consumption and for biofuels. Biomass can be used to produce electricity, heat and transport fuels and currently accounts for approximately two thirds of the renewable energy production in the EU. It will have to contribute even more in order to achieve the 2010 targets.



Bioenergy issues intersect with many policy areas and the task of promoting bioenergy both merits and requires an inter-departmental response. A Bioenergy Strategy Group was established in Ireland by the Department of Communications, Marine and Natural Resources to investigate the potential to stimulate increased use of biomass for energy conversion and to make specific recommendations for action to increase the penetration of biomass energy in Ireland.

The Final Report of the Bioenergy Strategy Group *Bioenergy in Ireland: A Strategy for Action* was completed in 2005 and is being considered in the context of renewable energy policy development.

There is potential within biodegradable municipal waste management to make a contribution to renewable energy generation through the development of active supply chains and from synergies with other biomass materials and fuels e.g. to co-fire peat power plants or cement kilns.

Race Against Waste

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 serious waste management challenge facing Ireland and that everyone has a responsibility to respond and improve our attitudes and practices. The campaign features 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.

The success of *Race Against Waste* is based on the fact that it is far more than an information campaign. It directly engages specific audiences who are creating waste - communities, businesses, large organisations and homes – with the objective of improving environmental behaviour. The *Race Against Waste* provides advice and operates programmes which help people to take action to reduce waste, reuse, recycle and compost.

The *Race Against Waste* has now entered a third year of operation, with youth and sports clubs being prioritised in the latest campaign. A new, interactive website - www.raceagainstwaste.ie/360 - has been developed in consultation



with youth groups and young people from around the country and is aimed specifically at teenagers. Challenge 360 provides up-to-date information for school or club projects and lets young people test their knowledge on waste awareness.



2. *Current Waste Management Performance*

Ireland is in the process of transforming to an integrated system of waste management, moving away from the traditional reliance on 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 BIODEGRADABLE 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 2004. The Agency has also compiled less detailed Interim National Waste Database Reports for 2002 and 2003 which provide particulars of the management performance on the principal waste streams, including biodegradable municipal waste. Further work has since been undertaken by the Agency and the resultant information and knowledge has been used to refine the published data.

2003 forms the base year for future projections of the quantities of biodegradable municipal waste which is generated. However, just prior to publication of this Strategy, the *National Waste Report 2004* figures became available from the Environmental Protection Agency. Use of the 2004 data does not make any material difference to future BMW projections and the *National Waste Report 2004* summary figures have been shown in the tables for completeness.

As indicated in Table 2.1, the figures record that biodegradable municipal waste generation has increased by about 50% in that 9-year period, with 1.935 million tonnes generated in 2004. The growth in biodegradable municipal 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 tandem 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.



Table 2.1 Biodegradable Municipal Waste Generation and Management: 1995 to 2004

Year	Gross Quantity Available	Landfill	Recovered	Rate
1995	1,289,911	1,147,320	142,591	11.1%
2001	1,525,315	1,291,464	233,852	15.3%
2002	1,727,490	1,365,628	361,862	20.9%
2003	1,855,505	1,317,560	537,944	29.0%
2004	1,935,214	1,304,426	630,788	32.6%

There has been a 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 sector. The improvement in recycling, while impressive, has not been adequate to substantially reduce the reliance on waste disposal, due to waste growth since 1995 – although the quantity of biodegradable municipal waste (BMW) being landfilled has now stabilised and has begun to decline since 2002.

Tables 2.2 and 2.3 on page 18 present details of the generation and management of the various categories of biodegradable municipal waste in 2003 and 2004.



Table 2.2 Biodegradable Municipal Waste Generation and Management, 2003

2003				
Material (tonnes)	Gross Quantity Available	Landfill	Recovered	Rate
Paper/Cardboard	812,038	453,160	358,878	44.2%
Textiles	148,253	144,790	3,463	2.3%
Organic Waste	753,083	705,775	47,308	6.3%
Wood	142,132	13,836	128,296	90.3%
Total	1,855,505	1,317,561	537,944	29.0%

Source: Derived from the *National Waste Database, 2003*, taking account of improved information and knowledge accumulated by the EPA since original publication.

Table 2.3 Biodegradable Municipal Waste Generation and Management, 2004

2004				
Material (tonnes)	Gross Quantity Available	Landfill	Recovered	Rate
Paper/Cardboard	821,903	446,306	375,597	45.7%
Textiles	157,521	146,986	10,535	6.7%
Organic Waste	780,460	696,955	83,505	10.7%
Wood	175,330	14,180	161,150	91.9%
Total	1,935,214	1,304,426	630,788	32.6%

Source: Derived from Table 9, *National Waste Report 2004*.



The increased generation of biodegradable municipal waste (BMW) since 1995 greatly increases the required extent of Ireland's diversion performance, since the Landfill Directive targets are based on the national BMW generation in that year.

2.2 IMPLEMENTATION OF WASTE MANAGEMENT PLANS

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

Based on the *National Waste Report 2004*, approximately 32.6% of biodegradable municipal waste generated in 2004 was diverted from landfill. By contrast, the targets of the Plans reflect the policy guidance provided in *Changing Our Ways* and typically require a minimum of 65% diversion of BMW from landfill by 2013.

2.2.1 Household Waste

Policies for household waste diversion revolve primarily around improving the collection systems for dry recyclables (paper, card, cans 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 position by the end of 2003 was that approximately 560,000 Irish households were serviced with a multi-bin collection. This corresponds to some 42% of households in the State. The extent of the segregated collection service for organic waste is estimated at approximately 52,800 households or c. 4% nationally.

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, and is estimated to amount to 69 sites in the *National Waste Report 2004*. Many facilities are benefiting from capital grant assistance under the Government's *Regional Operational Programmes, 2000-2006 – Capital Grants Scheme for Waste Management Infrastructure Projects*.



The DoEHLG publication *National Overview of Waste Management Plans* (2004) contains particulars of the source segregated collection systems implemented for dry recyclables and organic waste within the 10 waste planning regions / counties in 2003. Details are reproduced in Table 2.4 below.

Table 2.4 Segregated Kerbside Collection of Biodegradable Municipal Waste, 2003

Region/County	Estimated Total No. of Households	Kerbside Service	Rate
Dublin	380,000	294,000	77%
North East	122,000	51,000	42%
South East	145,000	63,000	43%
		16,000*	11%*
Midlands	100,000	29,000	29%
		12,000*	12%*
Mid West	140,000	43,500	31%
		3,000*	2%*
Connaught	160,000	51,000	32%
		21,800*	14%*
Cork	152,000	-	-
Kildare	59,000	29,000	46%
Wicklow	40,000	800	2%
Donegal	46,000	1,400	3%
Total	1,344,000	562,700	42%
		52,800*	4%*

* Separate Collection for Organic Waste.

Source: Derived from *National Overview of Waste Management Plans* (DoEHLG, 2004) and published information on population and households from the Central Statistics Office.



The progress in household waste collections is demonstrated in the EPA data for 2004 (the recycling rate for household BMW was reported in 2004 to be some 16.1%) and has increased substantially since 1995 (when it was estimated at 5.9%). Nonetheless, there is a need to improve the performance of the separate collection schemes, in terms of the range, quality and quantity of materials recovered, as well as the 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. The *Race Against Waste* campaign is giving a high priority to awareness raising of the issues associated with backyard burning and unauthorised disposal of household waste. In addition, enforcement measures are being taken by the appropriate authorities in order to reduce these practices. The elimination of unauthorised household waste disposal must continue to be assigned a high priority over the entire duration of this Strategy.

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 approximately 1 in 10 households with gardens is likely to be engaged in home composting.

Table 2.5 Local Authority Sales of Compost Bins up to July 2003

Region/County	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
Total	78,714

2.2.2 Commercial Waste

The recycling rate for commercial BMW collected in 2004 was reported in the National Waste Database for that year to be some 50.1%. The recycling rate for commercial BMW has grown steadily since 1995 (when it stood at an estimated 16.7%) and is closely linked to improved recovery of commercial packaging waste – mainly cardboard and wood - in line with the national obligations imposed through the EU Packaging Directive (94/62/EC). The general prohibition on the landfill of certain categories of packaging waste arising within the commercial stream – including paper and wood – has been a major contributory factor in the increased recycling rate.



Dublin City Council now collects cardboard separately in the city centre. Most commercial waste recycling is undertaken by private waste management contractors which are registered with REPAK.

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

2.2.3 Material Recovery Facilities

Material Recovery Facilities (MRFs) are an essential component of waste recycling infrastructure. MRFs typically focus on separating materials such as paper, plastic, metal, glass etc. into discrete streams from mixed waste and providing appropriate pre-treatment to prepare these for sale in markets for recyclables. Capacity in MRFs has been extended substantially in recent

years, particularly among private waste management companies. Trends in recovery of waste paper serve to indicate the prevailing performance levels for materials recovery (Table 2.6 below). Despite significant improvements, the dependency on landfill is still substantial. A total of 375,597 tonnes (45.7%) of household and commercial paper waste was recovered in Ireland in 2004, while 446,308 tonnes (54.3%) was landfilled.

Table 2.6 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%
2002	85.0%	15.0%	50.0%	50.0%
2003	75.8%	24.2%	43.3%	56.7%
2004	66.0%	34.0%	45.5%	54.5%

Source: Derived from EPA National Waste Reports 1995 to 2004 taking account if improved information and Knowledge accumulated by the Agency since the original publication.

2.2.4 Biological Treatment Facilities

Composting Facilities

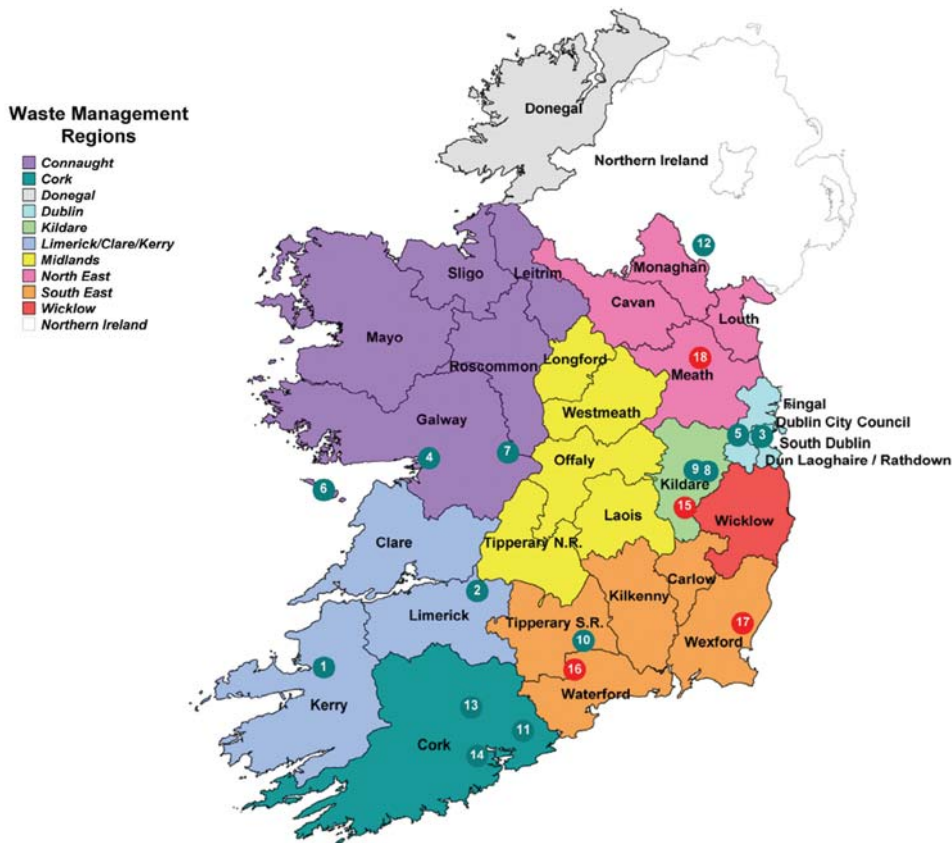
Source segregated household and commercial wastes of an 'organic' or 'putrescible' character - commonly referred to as 'biowaste' - and other biodegradable municipal wastes such as green waste, currently account for approximately 83,505 tonnes of BMW material composted in Ireland in 2004. (EPA, *National Waste Report 2004*).

There were sixteen composting facilities in operation in the Republic of Ireland at the end of 2003, 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 seeking authorisation and / or under development.



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 the Republic of 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 in accordance with the internationally-accepted waste management hierarchy is a key element of Irish waste management policy. The 10 Waste Management Plans for the regions/ counties of Ireland recognise this integrated policy role of thermal



treatment and facilities have been proposed by local authorities for the treatment of residual waste within 6 of the regions.

To date two proposals for incineration plants, in the North-East region (150,000 tonnes per annum) and the Dublin Region (approximately 550,000 tonnes per annum), are well underway. A facility has also been proposed for the Cork region, which would treat municipal waste at a co-incineration facility with hazardous waste when fully developed. There is a lengthy period required for obtaining planning, IPPC licensing and construction / commissioning of these facilities - therefore it is imperative that the process of procuring facilities be advanced as quickly as possible in those regions which have provided for thermal treatment within the statutory Waste Management Plan.

2.2.6 Mechanical-Biological Treatment

Mechanical-Biological Treatment (MBT) is a treatment process which can be used to stabilise and reduce the quantity of waste that is consigned to thermal treatment or landfill. MBT generally involves the stabilisation of the biodegradable material in a biological stage, together with the separation of mixed waste by mechanical means using shredders, screens, gravity separators, air classifiers, magnets and other devices. The organic material recovered by MBT typically emerges as a low quality material – ‘stabilised biowaste’ - that has limited applications. Some recyclable materials are recovered from the MBT process, but the majority of the residue is usually sent to energy recovery, or to landfill.

MBT can provide an outlet to limit the quantity of biodegradable municipal waste which ultimately needs to be sent to landfill and capacity developed should be suitable for the treatment of source-separated organics in the future.

2.2.7 Summary

In order to meet the targets set out in the Waste Management Plans, a several-fold increase in recycling capacity and biological treatment capacity is required. In addition, no thermal treatment capacity has yet been delivered. Furthermore, the extent of landfilling of waste remains greater than projections in the original suite of Plans. There is therefore an urgent need to procure the necessary alternative waste treatment capacity which will facilitate diversion of biodegradable municipal waste away from landfill.

3. Directive Targets – Scale of the Challenge

3.1 MANDATORY REQUIREMENTS

Article 5 of the EU Landfill Directive 1999/31/EC sets out the targets for diversion of biodegradable municipal waste (BMW) from landfill as follows:

- no later than 16th July 2006, biodegradable municipal waste going to landfills must be reduced to 75% of the total amount (by weight) of biodegradable municipal waste produced in 1995;
- no later than 16th July 2009, biodegradable municipal waste going to landfills must be reduced to 50% of the total amount (by weight) of biodegradable municipal waste produced in 1995; and
- no later than 16th July 2016, biodegradable municipal waste going to landfills must be reduced to 35% of the total amount (by weight) of biodegradable municipal waste produced in 1995.

However, Member States which consigned more than 80% of collected municipal waste to landfill are allowed to postpone the attainment of these targets by a period not exceeding four years. The *National Waste Database Report 1995* records that Ireland consigned some 92% of collected municipal waste to landfill in that year. Accordingly, Ireland is entitled to claim a derogation to the targets set out in the Landfill Directive for a maximum period of four years.

The outbreak of foot-and-mouth disease in the country in 2001 led to the introduction of stringent legislation (S.I. No. 597 of 2001) which greatly restricted the siting, reception and processing of animal by-products and the beneficial uses permissible for the treated products. Coupled with the requirements deriving from the implementation at EU level of Regulation (EC) No. 1774 of 2002 *laying down health rules concerning animal by-products not intended for human consumption*, it was necessary to fully clarify the veterinary requirements which are to apply to the biological treatment of biodegradable waste.

In the context of Regulation (EC) No. 1774 of 2002, veterinary Guidelines have recently been issued by the Department of Agriculture and Food in relation to Composting and Biogas Plants which treat animal by-products.



These new Guidelines will ensure a greater degree of certainty which should encourage private sector investment in developing biological treatment capacity.

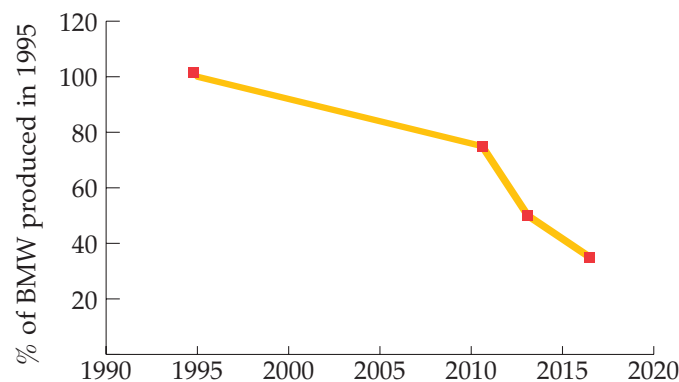
Having regard to the foregoing and, in particular, the deficit in necessary biological treatment capacity, Ireland proposes to avail of a four-year derogation for the first two phases of the biodegradable municipal waste diversion targets from landfill, as allowed by the Directive. Accordingly, this Strategy will be based on a first phase target date of 2010 (deferred from 2006) and a second phase target date of 2013 (deferred from 2009).

Ireland is strongly committed to achieving the targets at the earliest possible date and efforts must now focus on achieving the necessary biodegradable municipal waste diversion from landfill in advance of the revised target dates. Ireland will review the position in relation to the available four-year derogation from 2016 to 2020 and will come to an informed decision on the prospects for achievement of the third phase diversion targets as soon as practicable.

The revised first target date is therefore for the year 2010, by which we should reduce biodegradable municipal waste landfilling to 75% of the amount of BMW generated in 1995. Further reductions will be required in 2013 (to 50% of the amount of BMW generated in 1995) and by 2016 (to 35% of the amount of BMW generated in 1995 – subject to further review).

Figure 3.1 illustrates the extent of diversion of biodegradable municipal waste projected over the period of the Strategy.

Figure 3.1 Landfill Directive - required reduction in landfill of BMW





It should be noted (see Table 14.3) that the biodegradable municipal waste diversion target from landfill for 2013 is estimated at some 72.8% of BMW generation in that year – accordingly, the revised target remains more ambitious than the 65% target for diversion established for 2013 in *Changing Our Ways*.

The baseline BMW 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

Year	Target	BMW tonnes allowed in landfill
1995	(Baseline BMW generation)	1,289,911*
2010	75%	967,433
2013	50%	644,956
2016	35%	451,469

* Data derived from EPA *National Waste Database Report 1995* and refined through additional information and knowledge acquired by the Agency since publication of 1995 NWD.

3.2 PROJECTING WASTE GROWTH

In order to assess the implications of these targets, future waste generation and composition must be considered. For the purposes of this Strategy, 2003 is taken as the base year from which all future projections of biodegradable municipal waste generation levels are estimated.

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.

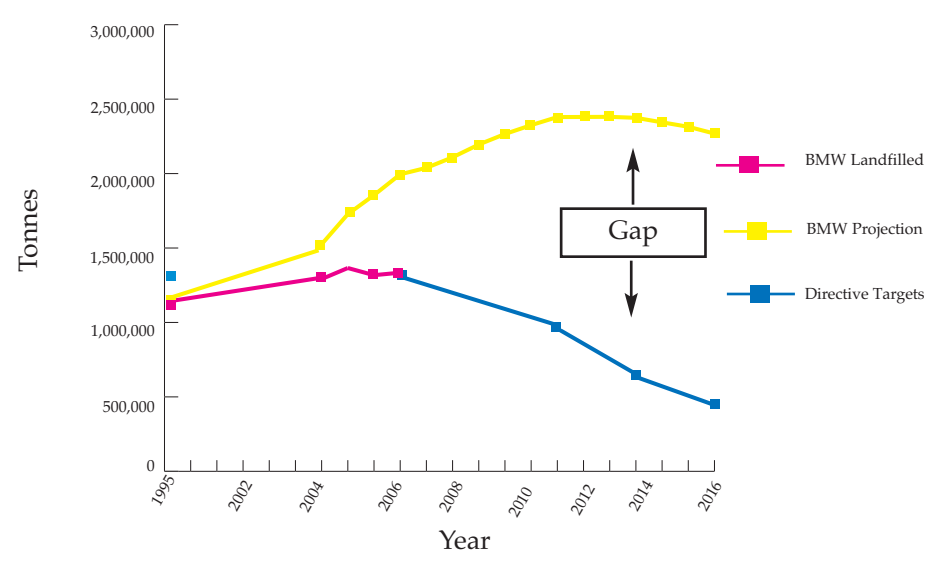
In addition, the National Waste Prevention Programme (NWPP) was established in 2004 and can be expected to yield significant results thereafter. To date, there has been no detailed statistical analysis of the likely effects of the Programme on the quantity of waste generated. However, there have



been anecdotal reports of appreciable reductions in the amount of waste presented since the introduction of the 'Pay-by-Use' (PBU) system on 1st January 2005. It is anticipated that the NWPP – in tandem with other related initiatives such as PBU and the *Race Against Waste* – will have a considerable impact upon waste generation in future years. Accordingly, a waste reduction factor of 3% is being applied for the year 2005, rising progressively to a level of 6% by the year 2016.

The extent of biodegradable municipal waste generation is fundamental to the ability of Ireland to comply with the landfill diversion targets. It is therefore imperative that data on BMW generation is kept under continuous surveillance and review. The Strategy must be refined as a matter of urgency through the implementation of appropriate measures should BMW generation projections be found to deviate from the anticipated levels. In terms of composition, this strategy assumes that the overall biodegradable municipal waste stream will continue to maintain substantially similar proportions of the existing constituents – paper / cardboard, textiles, organics and wood – as was in evidence in 2003. Figure 3.2 illustrates the gap – the capacity that has to be provided for alternative treatment methods – corresponding to the difference between the projected level of biodegradable municipal waste generation and the maximum amount of landfill permitted for BMW.

Figure 3.2





3.3 GAP ASSESSMENT

As outlined in Section 2, waste growth since 1995 means that Ireland is continuing to landfill increasing levels of biodegradable municipal waste - in other words, diverging away from the mandatory diversion targets, although the extent of landfilling has now stabilised and has begun to decline since 2002.

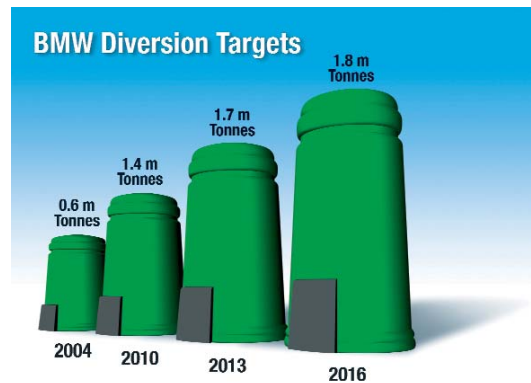


Table 3.2 outlines the total annual tonnage of waste that must be diverted from landfill in the key target years of 2010, 2013 and 2016, bearing in mind the BMW growth predicted for the future.

The 'gap' represents the amount of biodegradable municipal waste that must be diverted away from landfill in order for our mandatory requirements to be met. It also represents the capacity for alternative treatment methods that must be put in place to deal with biodegradable municipal waste diverted from landfill. Capacity will include appropriate waste collection infrastructure, pre-treatment infrastructure (such as Materials Recovery Facilities) and final processing capacity for the prepared recyclable materials. Each region/ county must either provide the required capacity directly or alternatively source the necessary capacity outside the region / county.

In 2004, c. 630,000 tonnes of BMW were diverted from landfill (mainly in favour of recycling and recovery). This must increase to approximately 1.41 million tonnes in 2010, rising to about 1.73 million tonnes in 2013 and an estimated 1.82 million tonnes by 2016. This represents a huge challenge to the Irish waste industry.



Table 3.2 Gap Analysis in terms of Total Treatment Capacity Required in 2010, 2013 and 2016

Year	Gap Analysis (at projected BMW growth rates)
2004 existing	630,788
2010 required	1,412,083
2013 required	1,729,585
2016 required	1,817,262

3.4 REGIONAL GAP ASSESSMENT

The assessment of capacity requirements, as indicated in Table 3.2, for alternative treatment methods to cater for the diversion of biodegradable municipal waste in the years 2010, 2013 and 2016 represents the national position. The various waste management planning regions / counties should assess their individual needs for BMW management. This approach will enable the gap or 'indicative target diversion capacity' for each region / county to be outlined. Note that the figures in Table 3.2 represent biodegradable municipal waste only, and further treatment capacity is required for other non-biodegradable municipal waste materials such as plastic, glass and metals.

There will be a certain amount of biodegradable municipal waste for which it is not feasible to achieve a sufficient level of segregated collection to satisfy the required landfill diversion targets. Accordingly, there will also be a need to collect this material as residual BMW and to provide treatment – either thermally or through some form of stabilisation – to reduce the biological activity to imperceptible levels and thereby ensure achievement of the mandatory diversion targets.

Regions / counties must decide how their Waste Management Plans can address these requirements.



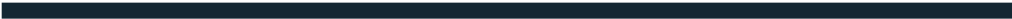
3.5 SUMMARY

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

Ireland's targets are linked to waste generation levels in 1995, prior to a period of unprecedented economic expansion.

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

Landfilling of BMW must be reduced from circa 1.305 million tonnes in 2004 to 967,000 tonnes by 2010.



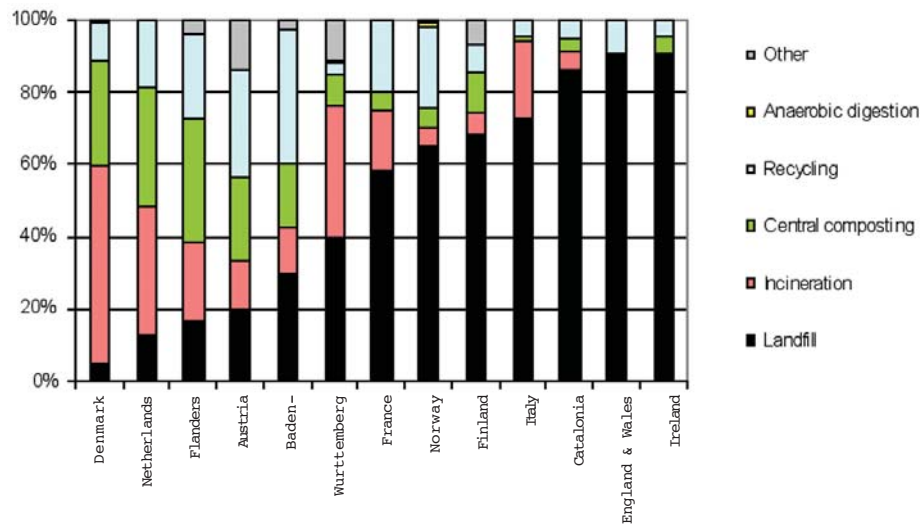
4. International Perspective

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, a European Environment Agency Report published in 2002 records that less than 20% of BMW was landfilled in Austria, the Netherlands and Denmark compared to more than 80% in Ireland, 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 has 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:

- materials recycling for paper and cardboard waste;
- central composting, mainly for garden waste and, to a lesser extent, for food waste; and
- 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.

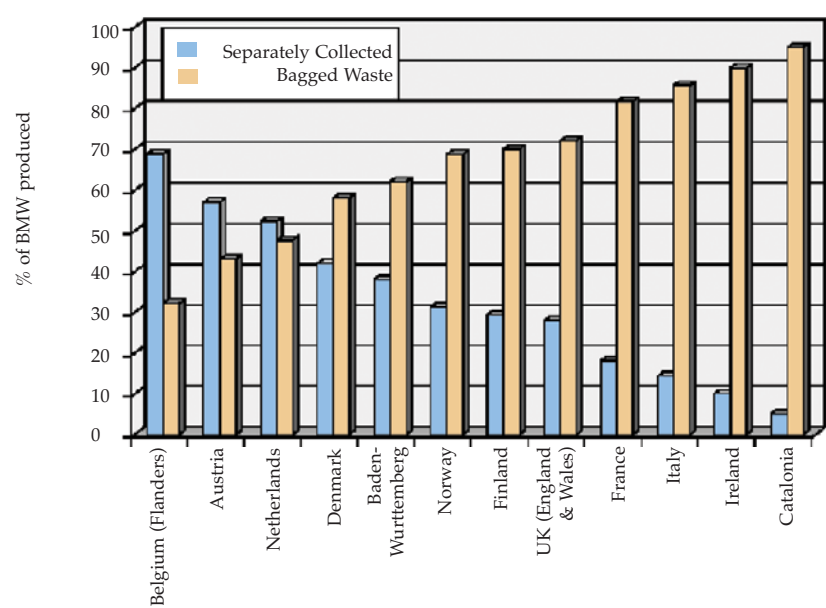
Countries with substantial central composting, mainly treat garden waste and, to a lesser extent, food waste. Anaerobic digestion is also in use, but to a much lesser extent. Countries producing high quality compost / digestate all have extensive separate collection systems, well-established quality assurance schemes 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), the Directive also requires that all plants should include recovery of the energy produced.

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, under appropriate waste and veterinary authorisations, such as top dressing on landfill cover.

Figure 4.2 Separate collection of municipal waste in the EU



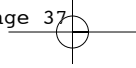
Source: European Environment Agency, 2002.



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; and
 - **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 exceedance 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 to 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.

In terms of the scope of Compost Standards, there are a variety of approaches adopted internationally. Typically a very high standard is set for products suitable for use in organic agriculture, an approach favoured by countries where composting is at an advanced state of development. Such countries make a clear distinction between product and waste - placing materials derived from mixed municipal waste and those with higher levels of contamination outside the definition of compost.

Other countries - Austria, Germany, Luxembourg and the Netherlands - take the precaution of allowing more than one compost standard. Austria has three classes: Class A+: top quality; Class A: high quality suitable for use in agriculture and Class B: minimum quality suitable for non-agricultural use. Compost produced from separately collected biowaste generally achieves Class A quality.

- **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 is 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 organically-amended growing media industry.

For example, approximately 600,000 tonnes per year of biowaste compost is produced in the Netherlands, while the potential market in the country for peat substitute in growing media is approximately three million cubic metres per year. The University of Wageningen (Netherlands) has undertaken important research in relation to the production of a high quality peat substitute from biowaste and found that the compost could be used as an amendment in peat at a rate of 20%. The research programme involved:

- overview of market potential;
- evaluation of quality of product achievable through advanced bio-processing of biowaste;
- evaluation of disease suppression characteristics of biowaste-derived compost;
- quality control requirements for the process; and
- field-testing of compost product to evaluate plant yields.



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

5. *Biodegradable Municipal Waste Strategy for Ireland*

5.1 OVERVIEW

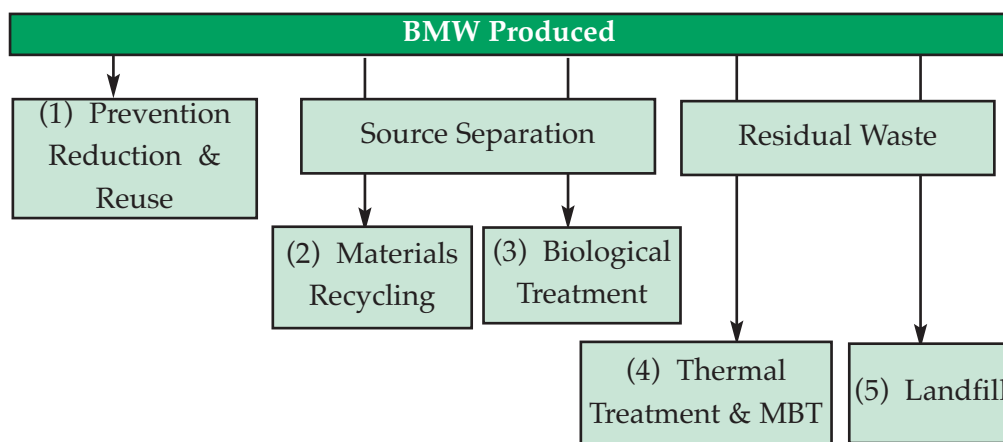
To reduce the environmental impacts of landfilling and meet the targets set in the Landfill Directive, the management of biodegradable municipal waste (BMW) will be improved by implementing a range of options.

The most desirable option is waste prevention or reduction of biodegradable municipal waste production, to minimise the amount of waste requiring collection and treatment. While not strictly waste prevention, home composting is a practical example of reducing the amount of waste presented for collection through the municipal management system. The next most desirable option is reusing BMW, such as cardboard and textiles. This strategy provides a combination of measures based on education / awareness and economic instruments aimed at reducing BMW generation.

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, mechanical biological treatment (MBT) 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 management 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; and
- 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 9 years, additional BMW will need to be diverted from landfill, despite current progress in recycling and biological treatment.

The focus of the Strategy is on the three key target years of 2010, 2013 and 2016. These dates give a realistic opportunity for recommendations to be implemented. There is an urgent need to commence establishment of the necessary recycling, biological and thermal treatment facilities. It is important that appropriate facilities are provided within new residential and commercial developments, particularly the increasing number of apartment complexes, to cater for the segregated reception and collection of suitable categories of BMW. The market development initiatives outlined and other supporting instruments also need to be put in place quickly. Summary



details of the targets have also been included in the Performance Indicators for Monitoring Strategy Implementation in Table 14.3.

Meeting the national recycling and biological treatment targets and the EU landfill diversion targets will result in the diversion of approximately 80% of all BMW from landfill in 2016. Approximately 1.82 million tonnes of BMW will need to be diverted annually from landfill by 2016 if waste growth continues as anticipated. This will require a substantial provision of additional recovery capacity, compared to the current capacity of approximately 630,000 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 limited – though greatly improved in recent years - recovery levels.

The quantities diverted by means of separate collection, materials recycling and biological treatment are still not sufficient to entirely bridge the gap between biodegradable municipal waste generation and the Landfill Directive targets. Meeting targets will therefore require that a certain proportion 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 for 2010, 2013
and 2016 (tonnes)**

BMW Treatment in 2010		
	Percent of BMW	Tonnes Diverted
Recycled	32.2%	765,050
Biological Treatment	14.2%	338,129
<i>Total Recycling</i>	<i>46.4%</i>	<i>1,103,179</i>
Residual Treatment	13.0%	308,904
Total Diversion	59.4%	1,412,083
Landfill	40.6%	967,433

BMW Treatment in 2013		
	Percent of BMW	Tonnes Diverted
Recycled	36.9%	876,849
Biological Treatment	17.5%	414,546
<i>Total Recycling</i>	<i>54.4%</i>	<i>1,291,395</i>
Residual Treatment	18.5%	438,190
Total Diversion	72.9%	1,729,585
Landfill	27.1%	644,956



BMW Treatment in 2016		
	Percent of BMW	Tonnes Diverted
Recycled	38.6%	875,371
Biological Treatment	19.5%	442,129
<i>Total Recycling</i>	<i>58.1%</i>	<i>1,317,500</i>
Residual Treatment	22.0%	499,762
Total Diversion	80.1%	1,817,262
Landfill	19.9%	451,469

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 61% for commerce in 2010, corresponding to 55% of overall paper / cardboard generation within BMW;
- 55% for households and 71% for commerce in 2013, corresponding to 65% of overall paper / cardboard generation within BMW; and
- 60% for households and 73% for commerce in 2016, corresponding to 67% of overall paper / cardboard generation within BMW.

These ambitious targets for materials recycling will require the widespread introduction of '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 biodegradable municipal waste away from landfill will require a high level of source separation of food and garden waste followed by biological treatment, through 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 the materials obtained from this process can readily be applied beneficially within domestic gardens. The target set is to implement home composting in 20% of urban households and 55% of rural households – equivalent to some 35% of all households - by 2010. The average yield per household is estimated as increasing from 40% to 45% over the period 2010 to 2016, equating to an estimated yield of 14% to 16% of household organic waste arisings. The 2003 NWD reports that household organic waste amounts to some two-thirds of all municipal organic waste generation – thus home composting is considered to have a potential yield of between 10% to 12% of available organic waste in the years 2010 and 2016.

Separate collection of biowaste will also be required, together with the provision of composting facilities for garden waste and centralised biological treatment facilities for food waste. The targets for central biological treatment are:

- 40% coverage for households and 60% coverage for commerce in 2010 at an estimated average yield of 45% to 60% respectively, corresponding to 25% of overall organic waste generation within BMW;
- 45% coverage for households and 70% coverage for commerce in 2013 at an estimated average yield of 50% to 65% respectively, corresponding to 33% of overall organic waste generation within BMW; and



- 50% coverage for households and 70% coverage for commerce in 2016 at an estimated average yield of 55% to 70% respectively, corresponding to 36% of overall organic waste generation within BMW.

Residual Waste

In order to meet the targets for diversion of BMW from landfill, treatment of residual waste will be needed to supplement the quantities of BMW which have been recycled / biologically treated following source segregated collection. This sets a requirement for residual BMW treatment capacity, without which the Landfill Directive targets will not be achieved, as follows:

- an estimated 308,904 tonnes of residual waste treatment will be necessary in 2010;
- an estimated 438,190 tonnes of residual waste treatment will be necessary in 2013; and
- an estimated 499,762 tonnes of residual waste treatment will be necessary in 2016.

These are the estimated tonnages of residual BMW which will be generated and which must still be diverted from landfill, even if the very ambitious performance targets for prevention, material recycling and biological treatment being set out in this Strategy are achieved. The estimated total amount of residual BMW generated – including BMW which can legitimately be consigned to landfill under Directive 99/31/EC - ranges from 951,221 tonnes to 1,276,337 tonnes per annum over the period 2010 to 2016.

In addition, there will also be residual waste generated from the municipal solid waste (MSW) stream which is not biodegradable. Estimates of the total quantity of residual MSW generated – including waste which can legitimately be consigned to landfill under Directive 99/31/EC - ranges from approximately 2.1 to 2.5 million tonnes per annum over the period 2010 to 2016.

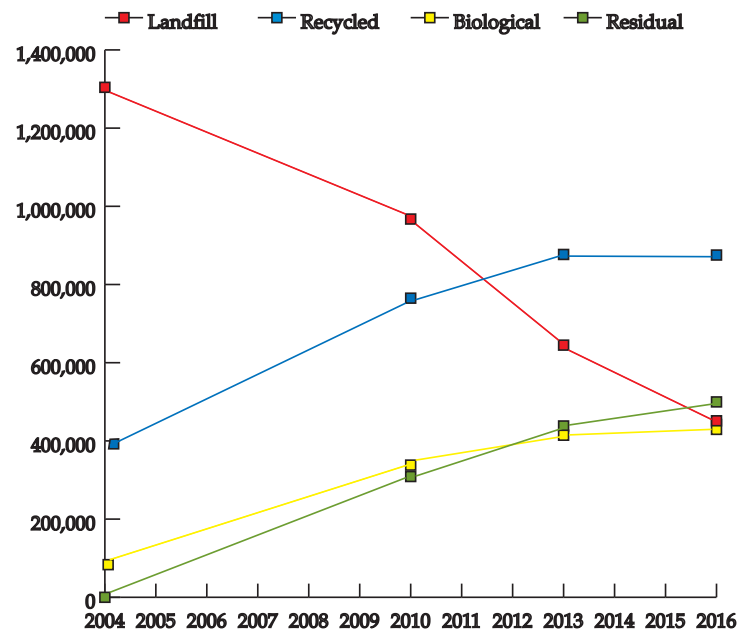


In addition, a significant quantity of residual industrial waste will also be generated in these years, which will be available for treatment or landfill.

The residual treatment identified in most Regional Waste Management Plans is thermal treatment with energy recovery, in recognition of the total waste arisings, although pre-treatment by mechanical-biological means can also play a role, followed by thermal treatment or landfill.

These requirements are illustrated in Figure 5.2.

Figure 5.2 National Treatment Capacity Targets for BMW



These national targets for BMW diversion for the years 2010, 2013 and 2016 represent the national position. As indicated in Section 3.4 of the Strategy, the various waste management planning regions / counties should assess their individual needs for BMW management in order to obtain an 'indicative target diversion capacity'. Regions / counties must then decide how their Waste Management Plans can address these requirements.

These figures should be kept under continuous review and updated regularly by each region / county, in order to ensure that sufficient capacity is available to facilitate the achievement of the required BMW diversion targets.



5.5 FUNDING

It is recognised that significant investment in new waste recovery facilities is necessary on an ongoing basis to reach ambitious national targets for recovery, recycling and appropriate treatment of residual waste. In the case of recycling infrastructure the Department, through the Environment Fund (and with ERDF support), has invested almost €60m since 2002 in co-funding local authority recycling facilities. It is however national policy that the cost of providing heavy waste infrastructure be met by end users. Typically such facilities will be provided in this way by the public (local authorities) or private sectors or by both sectors acting together by way of public private partnerships.

This application of the polluter pays principle, whereby generators of waste pay in proportion to the amount of waste which they produce, provides a source of income for the service providers from both the public and private sectors, and has facilitated a programme of investment in greatly improved collection and recovery infrastructure for BMW.

The private sector has seen recent significant transformation in the traditional waste management structure. This process of business consolidation has provided access to substantial financial resources to underwrite the cost of modernisation of the Irish waste management system.

The introduction of producer responsibility schemes, such as the Repak initiative in the packaging and packaging waste sector, has contributed further substantial financial resources and provided a focus on performance targets – including the recycling and recovery of paper / cardboard.

6. *Prevention and Minimisation of BMW*

Waste prevention and minimisation are the preferred management options in the waste hierarchy and are 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 2004, the amount of BMW produced increased by about 50% (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 percentage increase has been more pronounced in the commercial sector compared to household waste.

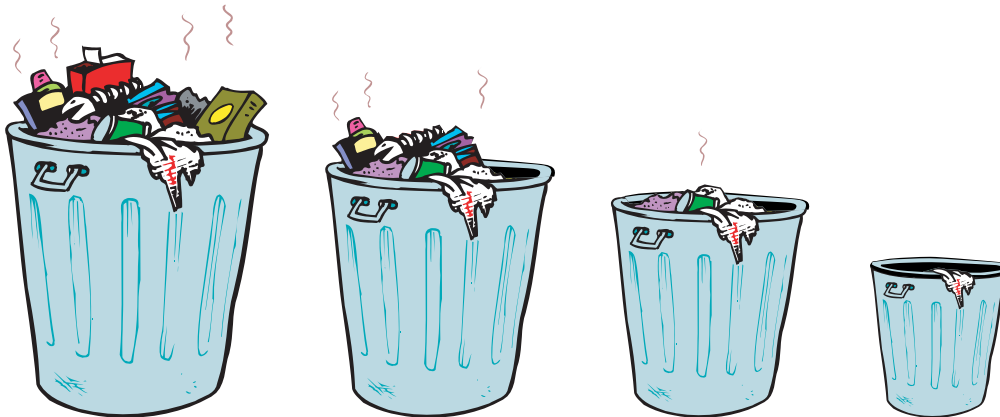
6.2 POLICY

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 ultimate 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 biodegradable municipal waste. For BMW, waste prevention refers to reducing the quantity of paper and cardboard, textiles, organic waste and wood which is generated.

Waste minimisation also includes home composting as a way of reducing the amount of food and garden waste requiring collection and treatment within the municipal system.



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. While progress has been made in recent years, further sustained, targeted information campaigns are needed to help raise awareness of waste management issues. A Core Prevention Team has been established in the EPA to drive an ambitious and well-resourced *National Waste Prevention Programme* (NWPP) as envisaged by the document *Delivering Change*, published in 2002.

The *National Waste Prevention Programme* aims at delivering substantial results on waste prevention and minimisation across all waste streams, including biodegradable municipal waste in both the household and commercial (including from institutions and organisations) sectors. The comprehensive Programme integrates a range of initiatives, including education and awareness measures, technical, training and financial assistance and incentivisation mechanisms.

A particularly important initiative proposed for the *National Waste Prevention Programme* is to develop a programme which is specifically designed to target the prevention of biodegradable municipal waste.



A National Waste Prevention Committee was established in 2004 to monitor the development of the Programme and to provide strategic direction for the Core Prevention Team for its implementation. The chairperson and the secretariat for the Committee is provided by the EPA. Membership is drawn from a wide range of governmental, non-governmental, business and sectoral interest groups.

An Outline Work Plan: 2004 - 2008 has been prepared. It describes the focus of the Programme and provides an outline of the projects that will be undertaken in the period 2004 to 2005 with an outlook to 2008. The Work Plan is available on the EPA website, www.epa.ie.

The Programme will build on initiatives such as the *Cleaner Greener Production Programme*.

The initial work of the Programme has focussed on consultation with stakeholder groups in order to develop a consensus on the needs and priorities of the Programme. In addition, mechanisms and measurement tools are being developed within the EPA to facilitate the implementation of the NWPP. Information collection procedures are also being refined to ensure their relevance to the needs of national policy, the Prevention Programme and other reporting obligations.

Significant future outputs from the Programme will be:

- **Waste Characterisation Study:** Study will provide intelligence on the composition of municipal waste from both the household and commercial waste streams. In addition, updated information on the categories of waste present in the various streams can be used to verify the success of waste prevention and material recovery initiatives.
- **Waste Prevention Case Studies:** An in-depth research programme will identify and develop case studies in exemplary waste prevention for wide dissemination. Target audiences will include seminars, training programmes and relevant companies and organisations.



- **Waste Prevention Webpage:** The Environmental Protection Agency website is being comprehensively upgraded and will include a dedicated section on the *National Waste Prevention Programme*. The site will have multiple electronic links to relevant case studies as well as information and guidance on waste prevention. Ultimately, the site will serve as an important Waste Information Resource Centre for business and the general public.
- **Resource Efficiency / Waste Audits:** A number of waste and resource efficiency tools have been researched. Suitable assessment techniques and methodologies for waste prevention planning will be developed by combining the most effective elements of the available approaches. A pilot audit programme will be developed for businesses and will facilitate further definition and optimisation of the methodology.
- **Packaging Waste Prevention:** Packaging waste tends to be a visible stream of waste and practical packaging waste prevention initiatives will be developed in collaboration with producers and the wider community.
- **Environmental Management Accounting Capacity:**
The development of capacity in Environmental Management Accounting in businesses can enable the key decision makers to realise the true costs of waste generation. This would lead to increased priority being given to waste prevention and minimisation at senior management level within individual companies and business sectors.

Cleaner Greener Production Programme

Under the *National Development Plan: 2000 – 2006*, the EPA is offering grant assistance through the *Cleaner Greener Production Programme* to businesses which are seeking to improve their environmental performance and are willing to publicise their results.

The approach involves the application of preventative environmental strategies throughout the business chain - to processes, products and services, thereby increasing environmental efficiency and reducing risks to



humans and the environment. These environmental strategies are aimed at the reduction of resource consumption and the avoidance of environmental pollution potential. Examples of initiatives in the various business phases are as follows:

- **Production processes:** the conservation of raw materials and energy, the elimination of undesirable substances and the reduction in the quantity and harmfulness of all emissions and wastes.
- **Products:** the reduction in the negative impacts over the life cycle of a product, from extraction of raw material through to final disposal.
- **Services:** the use of environmental protection as an important criterion in the design and delivery of services.

The objective of the Programme is to establish 'cleaner greener production' as a normal, routine practice within Irish business. Overall benefits of the Programme include:

- improved environmental performance;
- improved business practice;
- increased efficiency;
- reduced costs;
- reduced emissions to the environment;
- reduced waste generation; and
- reduced resource consumption.

Further details are available on website www.cleanerproduction.ie.

Local Authority Prevention Demonstration Programme

The EPA has launched a major initiative of the *National Waste Prevention Programme* in the form of the *Local Authority Prevention Demonstration (LAPD) Programme*. The objective of the Programme is to help participating local authorities to overcome barriers in relation to the promotion and support of waste prevention by providing:



- (a) direct grant-assistance to fund in-house resources; and
- (b) input by expert practitioners in waste prevention.

The LAPD Programme is funded from the Environment Fund. Local authorities have been invited to submit expressions of interest to participate in the Programme.

The primary objective of the *Local Authority Prevention Demonstration Programme* is to assist local authorities to achieve prevention in the public sector, households, business, industry, clubs, schools, third level educational establishments and the healthcare sector.

In Phase 1 of the Programme, local authorities who are approved for financial assistance will be invited to run prevention initiatives under an integrated prevention programme. The results of the initiatives will be measured and experiences will be shared through wide dissemination of the findings to other local authorities.

Phase 1 of the Programme will run for a period of 30 months commencing in the first half of 2006. Further phases of the *Local Authority Prevention Demonstration Programme* will be announced during 2006 and 2007.

Further information regarding the LAPD Programme is available on the EPA website at www.epa.ie.

Training Programme in Waste Prevention and Minimisation

The *National Waste Prevention Programme* aims to ensure that appropriately trained and qualified professionals are developed who have the capacity to implement waste reduction and avoidance programmes.

A certified training programme in Waste Prevention and Minimisation has been developed by the EPA in consultation with the Irish Business & Employers Confederation (IBEC) and the Clean Technology Centre. The Programme is aimed primarily at individuals - at either a technical or supervisory level - who are responsible for waste prevention and minimisation strategies either within their own organisation or on behalf of clients.



Further details on the Training Programme are available on website www.epa.ie.

Complementary Local Authority Initiatives

Initiatives undertaken under the *National Waste Prevention Programme* should be reinforced within the activities carried out at the local level. Information campaigns about waste prevention and minimisation will continue to be implemented 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 Chambers of Commerce, the EPA, third level institutions and so on, to facilitate communication within industry. Similar appointments should be made by other local authorities or regions.

At national level, new guidelines have been issued in Circular GCCC 04/04 on *Environmental Considerations in Public Procurement* by the Department of Finance to all public bodies (including Government Departments, local authorities etc.) in relation to the introduction of environmental considerations into public procurement. This encourages factors influencing 'sustainability' to be used as criteria of assessment when tendering works, service contracts and supply contracts. 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, as well as leading to energy efficiency and assessment of 'life-cycle costs' in goods or services that are contracted. Local authorities are encouraged to engage in environmentally responsible procurement to the greatest extent practicable.

Complementary Industry Initiatives

The Integrated Pollution, Prevention and Control (IPPC) licensing system is operated by the Environmental Protection Agency. One of the principal objectives of the IPPC licensing system is to secure ongoing progress by licensees in relation to waste prevention and minimisation at source, having regard to the principle of Best Available Techniques (BAT). All major industrial and manufacturing facilities in the State with significant pollution potential are subject to the IPPC licensing system.



Licensees are required to prepare recurring, once-off and annual reports as an integral part of the licensing process. Assessment of these reports allows compliance with license requirements and continuous improvement actions to be measured and evaluated. The EPA also enforces licence conditions through periodic monitoring, site inspections and full compliance audits. In addition, each license requires the development and implementation of an *Environmental Management Programme*, which can be used to monitor progress in environmental performance, compliance and corrective actions.

The Annual Reports on IPPC licensing and control which have been issued by the EPA have highlighted significant successes for companies in reducing the impact of their activities on the environment through waste prevention and minimisation endeavours. Industrial activities must continue to ensure that every opportunity to reduce the production of waste generation is implemented to the maximum practicable extent.

Companies which fall below the thresholds for inclusion within the IPPC licensing system should also apply similar principles. All companies should carry out waste audits, which can serve as a basis for the development of *Environmental Management Programmes* and the implementation of Waste Reduction Plans. In undertaking these initiatives, companies should have regard to relevant guidance and advice issued through the *National Waste Prevention Programme* and the *Race Against Waste* campaign.

Private sector organisations are not subject to the same level of procedural rules in the procurement process as the public sector and should therefore favour green purchasing policies to the greatest practicable extent. Business representative organisations – such as IBEC, RGDATA, Small Firms Association etc. – are strongly encouraged to develop a green procurement template for use by their member organisations.

6.3.2 Pay-By-Use schemes

Now that comprehensive recycling systems are in place, the DoEHLG has instructed local authorities to implement Pay-By-Use (PBU) schemes for household waste since 1st January 2005. PBU schemes contribute to increased waste prevention activities as well as to increased levels of source separation for recycling. Most commercial waste collection is also based on a volume or frequency related charge. Businesses are also encouraged to




clearly relate waste costs to the quantity produced – this approach allows the development of a financial indicator which can be applied in cost control - thereby promoting the practice of waste reduction in the commercial sector. PBU charges can be implemented through a combination of levying the frequency of collection, the volume of waste collected or the weight of waste presented. The system of PBU should be designed to ensure that the waste producer realises that there is an adverse financial consequence for every item of waste which is deposited in the refuse container. Examples of elements of PBU schemes 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; and
- 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.

The Department of the Environment, Heritage & Local Government has asked local authorities to engage with commercial waste collectors with a view to agreeing on a scheduling of payments (i.e. a pay-as-you go system) rather than a periodic lump sum payment.

The ERTDI Programme: 2000 – 2006 issued a *Call for proposals in the area of Waste and Resource Management* in July 2005. A study on PBU will be carried out under the ERTDI Programme and will inform future policy.

Prerequisites for successful PBU schemes include providing householders with the possibility of composting organic waste and recycling waste such as paper, glass, plastic, metal and hazardous waste. The success of PBU schemes can be further enhanced by high environmental consciousness among householders and sustained information campaigns about the system can generate improved performance in terms of behavioural change.



Good administrative systems are needed to manage most PBU schemes, particularly for weight-related charging. Some local authorities are investing in electronic 'waste intelligence systems' that present 'status reports' or invoices for a particular customer detailing the particulars of 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 daily practices and their weekly waste bill.

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

Monitoring of implementation should be undertaken by local authorities to identify the success of the scheme, any negative side effects and potential for improvements which can be made to the system.

6.3.3 Home composting

Garden waste and food waste of vegetable origin are particularly suitable for home composting. Home composting provides a way of reducing the amount of waste to be collected from each household, thereby minimising the environmental impacts and costs associated with managing food and garden waste. Local authorities should continue the process of providing home composting units (see section 2.1.1) to householders. In addition, awareness raising measures should include instruction, education and literature which is designed to optimise performance in home composting. Innovative mechanisms should be employed where possible e.g. encouraging the community to participate in the preparation of promotional literature and in the implementation of educational programmes for home composting. Garden waste from public parks and gardens should also preferably be composted on-site.

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);
- application of the polluter pays principle; and
- the availability of cheap home composters.

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

Direct financial subsidies were provided towards the purchase of home composting units. In addition, the pricing system for the collection of residual waste and segregated biowaste was reduced in proportion to the organic waste prevention levels achieved via home composting. These initiatives helped greatly 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.

On-site composting is a particularly important activity for schools, since the actual composting process itself is relevant to the science curriculum and provides a practical focus for environmental education. Awareness raising in schools is a particularly effective way of building up long-term benefits of environmental consciousness - including the benefits of 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 (section 13.4) 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 the success of waste recovery schemes and towards product policy initiatives. These approaches will focus on packaging design, ease of identity and separation of packaging stream, reusable packaging (ideally within a 'closed-loop' distribution / return system) initiatives etc. This forms one aspect of the work of the EPA Core Prevention Team.

Up until recently many companies have only considered impacts up until a product has 'reached the shelf'. The concept of 'Integrated Product Policy' (IPP) encourages manufacturers to adopt a wider perspective and 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. 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. The IPP approach is expected to gain added momentum as the initiatives undertaken in the NWPP begin to yield high dividends.

6.3.5 Reuse of textiles

The quantity of waste textiles generated in Ireland in the municipal waste (household and commercial) sector in 2004 are estimated in Table 6.1 below. Textiles should be collected separately and reused, particularly clothes from households.



Table 6.1 Waste Textile Generation and Recovery in 2004

Quantity generated	157,521 tonnes
Landfill	146,986 tonnes
Recovery	10,535 tonnes
Recovery Rate	6.7%

Source: EPA *National Waste Report 2004*

Good quality textiles should be dropped off by householders to charity and second-hand shops. Local authorities are also 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 8.0% of the total BMW stream and includes disposable nappies. It is possible that as much as 25% of all textile waste is suitable for reuse.

The Strategy target is to divert 25% of textile waste to reuse and recycling by 2016. The DoEHLG and local authorities will work in partnership with the community and voluntary sectors to expand existing capacity to handle the extra materials which will be collected, reused and recycled.

Local authorities are encouraged to promote source separation of reusable waste textiles through information campaigns.

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

6.3.6 Prevention and Reuse of Papers

The estimated quantity of waste paper / cardboard generated in Ireland in the municipal waste (household and commercial) stream in 2004 is shown in Table 6.2.



Table 6.2 Waste Paper / Cardboard Generation and Recovery in 2004

Quantity generated	821,903 tonnes
Landfill	446,306 tonnes
Recovery	375,597 tonnes
Recovery Rate	45.7%

Source: Derived from EPA *National Waste Report 2004*

Producers should endeavour to reduce the quantity of paper / cardboard waste generated through a combination of measures:

- the light-weighting of paper products by limiting the amount of material to the extent necessary to ensure efficient performance;
- the introduction of reuse systems to the greatest extent practicable.

The Department is currently in negotiations with the newspaper industry with a view to reducing the amount of newsprint which remains 'unsold' and consequently requires management.

Organisations and institutions should also introduce measures which serve to reduce paper / cardboard waste generation. Examples include:

- minimisation of packaging requirements;
- use of electronic rather than paper media for communications;
- writing on both sides of a sheet of paper;
- use of double-sided photocopying; and
- use of blank waste paper as 'jotters'.

Householders are strongly encouraged to exercise similar disciplines in their daily routines and should adopt purchasing practices which are designed to reduce waste paper generation.



Local authorities should highlight the potential for reduction in paper waste generation in businesses and in homes as integral parts of awareness and educational campaigns.

6.3.7 Targets

As indicated in section 3.2, significant results are anticipated from the implementation of the *National Waste Prevention Programme* – combined with the awareness/ education campaigns, the application of Pay-By-Use systems of waste charges and other ancillary waste prevention activities - over the duration of the Strategy.

The projections of biodegradable municipal waste generation in future years in the Strategy are based on an expectation that these waste prevention initiatives will yield dividends in reducing the quantity of BMW which would be generated in their absence.

The resulting reductions in BMW are forecast as follows:

- period 2005 to 2007: 3% reduction factor in each year,
- period 2008 to 2010: 4% reduction factor in each year,
- period 2011 to 2013: 5% reduction factor in each year, and
- period 2014 to 2016: 6% reduction factor in each year.

See table 6.3 - Summary of Measures - Waste Prevention



Table 6.3 Summary of Measures – Waste Prevention

Status 2004	
1,935,214 tonnes of BMW is generated.	
<i>National Waste Prevention Programme</i> established.	
Instruction given by Minister to implement Pay-by-Use for household waste from 1st January 2005.	
Integrated Pollution and Prevention Control licensing system in place	
Guidance provided on Environmental considerations in the procurement process.	
Home Composting Units distributed to 10% of suitable houses. Textile reuse being promoted.	
Paper prevention being promoted.	
2010	
Target	<i>National Waste Prevention Programme</i> and related Initiatives to effect 4% reduction in projected 2010 BMW generation quantities.
	2,379,516 tonnes of BMW generation projected.
2013	
Target	<i>National Waste Prevention Programme</i> and related Initiatives to effect 5% reduction in projected 2013 BMW generation quantities.
	2,374,541 tonnes of BMW generation projected.
2016	
Target	<i>National Waste Prevention Programme</i> and related Initiatives to effect 6% reduction in projected 2016 BMW generation quantities.
	2,268,731 tonnes of BMW generation projected.

7. Recycling of Paper and Cardboard

Paper / cardboard waste, at some 42.5%, represents the principal constituent of biodegradable municipal waste.

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

7.1 CURRENT STATUS

The percentages of household waste paper and cardboard currently being recovered are steadily increasing – 34.0% in 2004 - but remain well below the level of 54.5% achieved for the commercial sector in the same year. The dependency on landfill is therefore substantial.

Table 7.1 Household and Commercial waste paper / cardboard status (2004)

	Household	Commercial
Quantity generated	353,746 tonnes	468,157 tonnes
Landfill	233,446 tonnes, 66.0% of total	212,860 tonnes, 45.5% of total
Recovery	120,300 tonnes, 34.0% of total	255,297 tonnes, 54.5% of total

Source: Derived from Table 9 of *National Waste Report 2004*

7.2 TARGET

A combination of kerbside collection and centralised reception facilities (Recycling Centres and Bring Centres) will be employed to divert approximately:

- 55% of paper / cardboard to material recycling by 2010;
- 65% of paper / cardboard to material recycling by 2013; and
- 67% of paper / cardboard to material recycling by 2016.



Meeting these targets can divert between 24% and 29% of all BMW from landfill over the period 2010 to 2016, compared to the overall target BMW diversion rate of between 60% and 80% over the same period.

Parallel efforts to recycle paper in the packaging waste stream are required under the EU Packaging Directive (94/62/EC), the proposed targets for which are 60% recycling of packaging paper and cardboard by 31 December 2011 for Ireland. The *National Waste Report 2004* found that 310,641 tonnes of paper and cardboard packaging waste is generated each year, equivalent to 38% of total paper / cardboard in the municipal waste stream.

There is also a need to target the remaining 62% of paper / cardboard and to recycle non-packaging paper in particular from homes and business – such as newspaper and magazines, office paper, stationery etc.

7.3 COLLECTION SYSTEMS

Table 2.4 outlines the source segregated household collection systems in operation for dry recyclables within the various regions / counties in 2003. Collection systems will have to be further improved to achieve the volumes of paper recovery required to meet the Strategy targets. Collection should therefore be extended to include newsprint, writing paper etc. In addition, efforts will be needed to improve the paper / cardboard yield from individual collections.

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”. 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 Table 2.4 indicates that kerbside collection schemes related to paper cover about 42% of all households. Further schemes available for the reception of paper / cardboard include both bring bank collection points and drive-in recycling centres.

DoEHLG is in dialogue with the newspaper industry in relation to the collection and recycling of newsprint.



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
Cardboard	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 commercial sources (including non-household and non-industrial producers such as institutions and organisations) 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 paper / cardboard packaging waste arising 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 also have to be collected for recycling.

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 collected and pre-treated prior to recycling in the target years applicable to increased BMW diversion rates is as follows:

- 2010 572,702 tonnes minimum
- 2013 675,414 tonnes minimum
- 2016 665,173 tonnes minimum

This requires a 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 priority streams of waste 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 on the island of Ireland, with two primary paper producers - Huhtamaki and Erin Moulded Fibre - being recovered paper based businesses. Less than 2% of recovered paper and cardboard is shredded and used as animal bedding.



Table 7.3 Paper & Cardboard recycling targets in Domestic and Commercial Waste Streams for 2010, 2013 and 2016

2004 (Actual tonnes)			
	Household	Commercial	Total
Total Produced	353,746	468,157	821,903
Quantity Recycled	120,300	255,297	375,597
Recycling Rate	34.0%	54.5%	45.7%

2010 (tonnes)			
	Household	Commercial	Total
Total Produced	395,686	645,591	1,041,277
Recycling Target	45.0%	61.0%	55.0%
Capacity required	178,059	394,643	572,702

2013 (tonnes)			
	Household	Commercial	Total
Total Produced	394,858	644,241	1,039,099
Recycling Target	55.0%	71.0%	65.0%
Capacity required	217,172	458,242	675,414

2016 (tonnes)			
	Household	Commercial	Total
Total Produced	377,262	615,534	992,796
Recycling Target	57.0%	73.0%	67.0%
Capacity required	215,040	450,133	665,173



The domestic recycling capacity for paper and cardboard is not adequate to meet these requirements. Capacity – including waste collection infrastructure, pre-treatment infrastructure (such as Materials Recovery Facilities) and final processing capacity need to be put in place to deal with the paper / cardboard waste which is diverted from landfill. Each region / county must either provide the required capacity directly or alternatively source the necessary capacity outside the region/ county.

Table 7.4 Summary of Measures – Paper and Cardboard

Status 2004	
375,597 tonnes paper / cardboard recovered.	
Actual recycling rate of 45.7%.	
2010	
Target	572,702 tonnes paper / cardboard recovered. Target 45% recycling of household paper, and 61% recycling of commercial paper - 55% overall recycling rate.
Collection	All households to have access to: Kerbside recycling and recycling centres. Intensive networks of convenient bring banks are an option for rural areas and multi-storey urban areas. All commercial enterprises to have separate collection for paper / cardboard.
Recovery	Provide MRF capacity of 572,702 tonnes (paper / cardboard) by 2010
2013	
Target	675,414 tonnes paper / cardboard recovered. Target 55% recycling of household paper, and 71% recycling of commercial paper - 65% overall recycling rate.



Collection	<p>All households to have access to:</p> <p>Kerbside recycling and recycling centres. Intensive networks of convenient bring banks are an option for rural areas and multi-storey urban areas.</p> <p>All commercial enterprises to have separate collection for paper / cardboard.</p>
Recovery	<p>Provide MRF capacity of 675,000 tonnes (paper / cardboard) by 2013.</p>
2016	
Target	<p>665,173 tonnes paper / cardboard recovered.</p> <p>Target 57% recycling of household paper, and 73% recycling of commercial paper - 67% overall recycling rate.</p>
Collection	<p>All households to have access to:</p> <p>Kerbside recycling and recycling centres. Intensive networks of convenient bring banks are an option for rural areas and multi-storey urban areas.</p> <p>All commercial enterprises to have separate collection for paper / cardboard.</p>
Recovery	<p>Provide MRF capacity of 675,000 tonnes (paper / cardboard) to 2016.</p>



8. *Biological Treatment of Food and Garden Waste*

Organic material such as food and garden waste – also referred to as ‘biowaste’ - comprises some 40% of biodegradable municipal waste and represents a major constituent of BMW.

Ambitious recycling rates for food and garden waste will be pursued to help meet the overall landfill diversion targets for BMW.

8.1 CURRENT STATUS

The amount of municipal food and garden waste generated in 2004 was 780,460 tonnes, accounting for approximately 40% of BMW.

Table 8.1 Food and garden waste status, 2004

	Household food and garden waste	Commercial food and garden waste
Quantity available	487,933 tonnes	292,527 tonnes
	457,928 tonnes	239,027 tonnes
Landfill	93.9% of total generated	81.7% of total generated
	30,005 tonnes	53,500 tonnes
Recovery	6.1% of total generated	18.3% of total generated

Source: Derived from Table 9, *National Waste Report 2004*

Total biological treatment capacity in operation in 2004 was approximately 100,000 tonnes per annum, but this includes treatment of sludges and industrial waste. Performance has improved since 2004, and significant additional capacity is in planning and / or under development.



8.2 TARGETS

A combination of home composting and centralised biological treatment facilities will be employed to divert approximately:

- 35% of organic waste to biological treatment of source-separated material by 2010;
- 43% of organic waste to biological treatment of source-separated material by 2013; and
- 50% of organic waste to biological treatment of source-separated material by 2016.

As food and garden waste accounts for 40% of the total BMW produced, meeting these targets can divert between 338,129 tonnes and 442,129 tonnes from landfill over the period 2010 to 2016, corresponding to between 14% and 20% of all BMW, as indicated in Table 8.4.

Measures proposed to achieve these targets for the key diversion years of 2010, 2013 and 2016 include:

2010

- Minimum of 40% coverage for separate collection and biological treatment of biowaste from households at an average yield of 45% - including green waste brought directly to centralised Green Waste Composting Facilities by householders;
- Minimum of 35% coverage for home composting of garden waste and food waste of vegetable origin at an average yield of 40% of biowaste arisings – targeted particularly in suitable areas where separate collection not in place; and
- Minimum of 60% coverage for separate collection and biological treatment of food waste from commerce at an average yield of 60%.



2013

- Minimum of 45% coverage for separate collection and biological treatment of biowaste at an average yield of 50% - including green waste brought directly to centralised Green Waste Composting Facilities from households;
- Minimum of 35% coverage for home composting of garden waste and food waste of vegetable origin at an average yield of 40% of biowaste arisings – targeted particularly in suitable areas where separate collection not in place; and
- Minimum of 70% coverage for separate collection and biological treatment of food waste from commerce at an average yield of 70%.

2016

- Minimum of 50% coverage for separate collection and biological treatment of biowaste at an average yield of 55% - including green waste brought directly to centralised Green Waste Composting Facilities from households;
- Minimum of 40% coverage for home composting of garden waste and food waste of vegetable origin at an average yield of 40% of biowaste arisings – targeted particularly in suitable areas where separate collection not in place; and
- Minimum of 70% coverage for separate collection and biological treatment of food waste from commerce at an average yield of 70%.

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, local authorities can apply conditions using the Waste Management (Collection Permit) Regulations 2001, with reference to DoEHLG Circular WIR 05/04, to facilitate the implementation of source segregated collection systems for biowaste. Local authorities involved in the collection of waste should also implement the same collection conditions as are imposed upon private collectors.



8.3.1 Households and Communities

Single-dwelling households (i.e. houses) in both rural and urban areas, where there is suitable garden space, will be encouraged to compost their garden waste at home and to use the material produced as a soil improver. Particular emphasis will be placed on home composting of food waste (of vegetable origin – excluding meat, fish and poultry) in rural areas where a separate collection system for organic waste is not feasible. Targets are based on 20% of urban households and 55% 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-dwelling households (i.e. flats / apartments) should also either be composted on-site or treated at a central composting facility.

Separate collection of organic waste will be required in all suitable urban and 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-dwelling or inner-city households	Single dwelling households	
Garden	recycling centres	home composting recycling centres kerbside, separate collection	home composting recycling centres kerbside, separate collection
Food	kerbside, separate collection*	home composting (veg. part only – excl. meat, fish and poultry) kerbside, separate collection	home composting (veg. part only – excl. meat, fish and poultry) kerbside, separate collection

** requires pilot studies in Ireland*

There are some practical limitations with separate collections of food waste in inner-city areas or in urban areas of multi-dwelling households, 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 be introduced.

Community composting facilities are an emerging system at European level, whereby local communities can become involved in the management of their own wastes. This approach facilitates implementation of the proximity principle and increases 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 green waste arising from tidy towns schemes, local composting of green waste from public open spaces, in 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 commercial sources (including non-household and non-industrial producers such as institutions and organisations) is required in order to meet the target for 2010. 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;
- retail sector - supermarkets, fruit and vegetable shops, food sector retail outlets;
- businesses and offices with kitchen / canteen facilities; and
- canteen kitchens – in major companies and institutions.

Requiring separate container collection of food waste from commerce will be considered in circumstances where food waste generation is at a level greater than 50 kg per week. The penetration of separate collections into the commercial sector should be progressively increased in order 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 operational capacity in 2004 was c. 100,000 tonnes per annum – this must increase to the following levels in the key Strategy target years of 2010, 2013 and 2016:

- 2010 250,000 tonnes minimum
- 2013 320,000 tonnes minimum
- 2016 330,000 tonnes minimum



Protection of the Environment

In parallel to the adoption of Directive 99/31/EC on the landfill of waste, the European Commission initiated structured dialogue on harmonised technical requirements and standards that might be applied to the management of biodegradable waste. A Technical Working Document¹ was issued by the Sustainable Resources Section of DG Environment, which proposed measures for:

- collection of biowaste;
- reception of biowaste at biological treatment facilities;
- treatment of biowaste;
- production of treated biowaste;
- trade of treated biowaste; and
- transport of treated biowaste.

The Environmental Protection Agency has already essentially adopted – for the purposes of waste licence compliance - the technical requirements for biowaste management being promoted in the Technical Working Document in respect of the collection, reception and treatment of biowaste, as well as standards for the compost produced in the process.

The European Commission does not now intend to present a Proposal for a Directive on Biowaste, but is considering alternative approaches based on quality standards, including the adoption of compost quality criteria under the proposed “end-of-waste characteristic” provision to be introduced through a review of the Waste Framework Directive (Directive 75/442/EEC on Waste). The European Commission is also giving serious consideration to the inclusion of the biological treatment of waste within the scope of the IPPC Directive (Directive 96/61/EC concerning Integrated Pollution Prevention and Control).

The European Commission also proposes to develop guidelines in relation to the application of life-cycle philosophy to biowaste management. When these documents are published, Ireland will examine this *National Strategy on*

¹ Biological Treatment of Biowaste, issued by the Sustainable Resources Section of DG Environment (European Commission), Ref. DG ENV.A.2/LM/biowaste/2nd Draft of 12th February 2001.



Biodegradable Waste for consistency with the principles contained in the guidelines and will make any appropriate revisions in the National Strategy. Requirements imposed on biological treatment of biowaste from this perspective of environmental protection are in addition to the veterinary technical standards imposed by Animal By-Products Regulation (EC) No. 1774/2002 and associated Regulations, which are discussed in further detail below.

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.

Under the provisions of the European Communities (Animal By-Products) Regulations 2003 (S.I. No. 248 of 2003 – as amended by S.I. 707 of 2005), compliance with national legislation requires composting and anaerobic digestion facilities which treat animal by-products to obtain veterinary approval from the Department of Agriculture and Food. This will be in addition to the normal waste authorisation. To provide clarity on the veterinary requirements, the Department of Agriculture and Food has issued information notes *Conditions for Approval and Operation of Composting and Biogas Plants Treating Animal By-Products in Ireland* and *Guidance for Applicants Wishing to Treat Animal By-Products in Composting and Biogas Plants in Ireland*.

For proposed new composting or biogas facilities, the veterinary approval process has been deliberately separated into two discrete stages in order to provide applicants with a greater degree of certainty in the outcome.



- The first stage is a notification of intention to build a facility, which is designed to facilitate an “approval in principle” for the notifier that the proposed facility has the capacity to comply with veterinary legislation.
- The second stage is a formal application for approval when the facility is built and will require the applicant to demonstrate that the plant operates, upon commissioning, in accordance with:
 - specifications agreed during the first stage; and
 - that correct procedures are in place at the plant to ensure that all material passing through the plant will be handled and treated in compliance with EU Regulation 1774/2002.

When preparing applications for the aforementioned stages of approval through a *Notification Form of Proposal to Build a Composting or Biogas Facility* or an *Application Form for Approval to Treat Animal By-Products in Composting or Biogas Plants*, submissions should have due regard to the requirements and parameters stipulated within the information notes issued by the Department of Agriculture and Food.

It is intended that the enforcement and monitoring of the veterinary and waste authorisations will be streamlined as far as is practicable – consistent with the need:

- to minimise the administrative burden on facility operators;
- to ensure compliance with the conditions of each approval; and
- to ensure that a robust enforcement regime is put in place which is capable of securing convictions through the prosecution of non-compliant facilities.

Synergies with Other Organic Waste Streams

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.

Screening matured compost at the Ballinasloe Composting Facility





Table 8.3 Organic BMW biological treatment targets in Domestic and Commercial Waste Streams for 2010, 2013 and 2016

2004 (Actual tonnes)			
	Household	Commercial	Total
Total Produced	487,933	292,527	780,460
Quantity Recycled	30,005	53,500	83,505
Recycling Rate	6.1%	18.3%	10.7%
2010 (tonnes)			
	Household	Commercial	Total
Total Produced	603,802	362,201	966,083
Recycling Target	18.0%	36.0%	25.0%
Capacity required	108,684	132,837	*241,521
2013 (tonnes)			
	Household	Commercial	Total
Total Produced	602,537	361,523	964,062
Recycling Target	22.5%	50.0%	33.0%
Capacity required	135,571	182,569	*318,140
2016 (tonnes)			
	Household	Commercial	Total
Total Produced	575,690	345,414	921,104
Recycling Target	27.5%	50.0%	36.0%
Capacity required	158,315	173,282	*331,597

**Note: treatment capacity figures exclude home composting requirements*



Table 8.4 Summary of Measures – Food and Garden Waste

Status 2004	
83,505 tonnes of municipal food and garden waste recovered (10.7% of quantity generated)	
2010	
Target	<p>338,129 tonnes of municipal food and garden waste recovered</p> <p>Household targets:</p> <p>13.5% home composting</p> <p>18% biological treatment of household organic waste</p> <ul style="list-style-type: none"> • separate organic waste collection in 40% of households • delivery of green waste by householders to centralised green waste composting facilities. <p>Commercial targets:</p> <p>36% commercial food waste diverted</p>
Collection	<p>All households to have access to:</p> <p>Recycling centres for green waste</p> <p>Home composting bin for food and garden waste</p> <p>Kerbside organic recycling in urban areas</p> <p>Relevant commercial enterprises to have separate collection for food waste</p> <p>Pilot collections for multi-unit and inner-city dwellings</p>



Recovery	<p>Biological Treatment capacity to expand to minimum of 250,000 tonnes by 2010</p> <p>Combination of green waste composting, central composting and anaerobic digestion</p>
2013	
Target	<p>414,546 tonnes of municipal food and garden waste recovered</p> <p>Household targets:</p> <p>13.5% home composting</p> <p>22.5% biological treatment of household organic waste</p> <ul style="list-style-type: none"> • separate organic waste collection in 45% of households • delivery of green waste by householders to centralised green waste composting facilities. <p>Commercial targets:</p> <p>50% commercial food waste diverted</p>
Collection	<p>All households to have access to:</p> <p>Recycling centres for green waste</p> <p>Home composting bin for food and garden waste</p> <p>Kerbside organic recycling in urban areas</p> <p>Relevant commercial enterprises to have separate collection for food waste</p> <p>Pilot collections for multi-unit and inner-city dwellings</p>



Recovery	<p>Biological Treatment capacity to expand to a minimum of 320,000 tonnes by 2013</p> <p>Combination of green waste composting, central composting and anaerobic digestion</p>
2016	
Target	<p>442,129 tonnes of municipal of food and garden waste recovered</p> <p>Household targets:</p> <p>16% home composting</p> <p>27.5% biological treatment of household organic waste</p> <ul style="list-style-type: none"> • separate organic waste collection in 50% of households • delivery of green waste by householders to centralised green waste composting facilities. <p>Commercial targets:</p> <p>50% commercial food waste diverted</p>
Collection	<p>All households to have access to:</p> <p>Recycling centres for green waste</p> <p>Home composting bin for food and garden waste</p> <p>Kerbside organic recycling in urban areas</p> <p>Relevant commercial enterprises to have separate collection for food waste</p> <p>Pilot collections for multi-unit and inner-city dwellings</p>



Recovery Biological Treatment capacity to expand to a minimum of 330,000 tonnes by 2016

Combination of green waste composting, central composting and anaerobic digestion



9. Treatment of Residual Waste

9.1 POLICY

This *National Strategy on Biodegradable Waste* is designed to secure the diversion of biodegradable municipal 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. This strategy aims to prevent waste, maximise the recovery of useful materials and energy from residual waste, in accordance with the EU Waste Hierarchy.

Separately collected BMW that is not suitable for recycling or biological treatment or alternatively 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 collection for recycling and composting;
- residues from recycling and composting facilities – i.e. unsuitable material that is screened out in the process; and
- 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 in order to meet the landfill diversion targets, partly due to the level of waste growth since the base year 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.



9.2 CURRENT STATUS

In 2004, 1,304,426 tonnes of biodegradable municipal waste was landfilled. This is effectively the extent of the biodegradable municipal waste stream available for 'residual treatment' in that year.

9.3 TARGETS

BMW which cannot be prevented, reused, recycled or biologically treated will be collected as residual BMW. It will not be possible to landfill all of this material due to the mandatory diversion targets for BMW contained in the Landfill Directive. Table 9.1 outlines the minimum quantities of residual BMW which will require alternative treatment and the maximum quantities of residual BMW which can be landfilled.

Table 9.1 Projected Generation and Management of Residual BMW: 2010 to 2016

Year	Projected Quantity of Residual BMW Collected (tonnes)	Maximum Quantity of Residual BMW to Landfill (tonnes)	Minimum Quantity of Residual BMW for Alternative Treatment (tonnes)
2010	1,276,337	967,433	308,904
2013	1,083,146	644,956	438,190
2016	951,231	451,469	499,762

These figures do not take account of non-biodegradable municipal solid waste and industrial waste which is generated and which cannot be recycled or biologically treated. It is estimated that the total amount of municipal solid waste which will be generated as residual waste ranges from 2.1 to 2.5 million tonnes over the period 2010 to 2016.



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. Even allowing for the achievement of the very ambitious prevention, recycling and biological treatment targets for BMW, the estimated total amount of residual BMW generated ranges from 951,221 tonnes to 1,276,337 tonnes per annum over the period 2010 to 2016.

As already noted, the total residual municipal solid waste (MSW) stream is estimated to range from approximately 2.1 to 2.5 million tonnes per annum over the period 2010 to 2016. In addition, a significant quantity of residual industrial waste will also be generated in these years, which will be available for treatment or landfill.

9.5.1 Thermal Treatment

Thermal treatment with energy recovery in accordance with the internationally-accepted waste management hierarchy is a key element of Irish waste management policy. The 10 Waste Management Plans for the regions/ counties of Ireland recognise this integrated policy role of thermal treatment and facilities have been proposed by local authorities for the treatment of residual waste within 6 of the regions. 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 700,000 tonnes per 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 in this Strategy.

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 provided for thermal treatment with energy recovery and 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

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 employed in association with 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 material – ‘stabilised biowaste’ - that has limited applications. As indicated in section 8.4 of the Strategy, all processes which employ biological treatment of animal by-products through either composting or anaerobic digestion are subject to animal by-products legislation and must obtain veterinary



authorisation from the Department of Agriculture and Food in addition to the normal waste authorisation.

Examples of where the product may be used include in landfill cover, or in creating embankments and screening bunds on landfills or quarries – all subject to compliance with the prevailing veterinary legislation.

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 1-2 years distant. A more basic form of MBT is currently taking place to a limited extent in certain counties.

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 permissible uses of MBT-derived 'stabilised biowaste' outputs such that it does not counteract the development of markets for high quality compost.

The ERTDI Programme: 2000 – 2006 issued a *Call for proposals in the area of Waste and Resource Management* in July 2005. Theme 2 related to *Developing Sustainable Organic Waste Management and Composting*. A Study is now being carried out into the potential contribution of MBT to biodegradable municipal waste management in Ireland under the ERTDI Programme and will inform future policy.



Table 9.2 Summary of Measures – Residual Waste

Status 2004	
BMW Landfilled	1,304,426 tonnes
2010	
BMW Landfilled	Reduce landfilling of residual BMW to 967,433 tonnes
Prevention / Minimisation measures	Refer to Chapter 6
Collection, Recycling and Biological Treatment	Switch from mixed collection to separate collections (Refer to Chapters 7 & 8)
Recovery Capacity	Provide minimum residual treatment capacity for a minimum 308,904 tonnes of residual BMW (Refer to Chapter 9)
	Preferred methods:
	Thermal treatment with Energy Recovery
	MBT followed by Energy Recovery
	MBT with fully stabilised residue to landfill

2013

BMW Landfilled	Reduce landfilling of residual BMW to 644,956 tonnes
Prevention / Minimisation measures	Refer to Chapter 6
Collection, Recycling and Biological Treatment	Switch from mixed collection to separate collections (Refer to Chapters 7 & 8)
Recovery Capacity	<p>Provide minimum residual treatment capacity for a minimum 438,190 tonnes of residual BMW (Refer to Chapter 9)</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>



2016

BMW Landfilled	Reduce landfilling of residual BMW to 451,469 tonnes
Prevention / Minimisation measures	Refer to Chapter 6
Collection, Recycling and Biological Treatment	Switch from mixed collection to separate collections (Refer to Chapters 7 & 8)
Recovery Capacity	<p>Provide minimum residual treatment capacity for a minimum 499,762 tonnes of residual BMW (Refer to Chapter 9)</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>

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 (EEA, published in 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 :

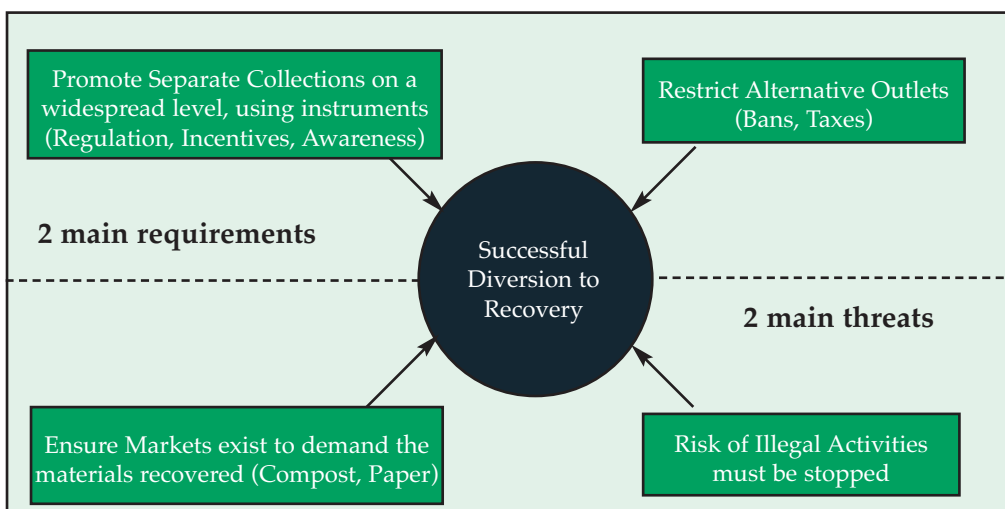
1. high rates of diversion of waste from landfill; and
2. high rates of material recovery for BMW.

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 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 – already very much in evidence in Ireland - will be extended and intensified:

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 – through the Office of Environmental Enforcement and the National Enforcement Network - 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.

The implementation of these mechanisms is described in more detail in 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 areas for 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 transitional period prior to full implementation.

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.); and
- 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 of practice which must be implemented. 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 the collection of waste should also implement the same collection conditions as are imposed upon private collectors.

11.2 WASTE BYE-LAWS

Bye-laws governing waste presentation should be adopted locally to support the implementation of separate collection systems as proposed under the Waste Management Plans, 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; and
- timetable / frequency for presentation of the material.

Bye-laws need to be introduced in parallel with the collection systems required under the Waste Collection Permits and / or implemented by local authority waste collection services. The existence of new Bye-Laws for waste need to be brought to the attention of residents or businesses, and enforced by local authorities. Sanctions should be specified within Bye-Laws and will typically include an initial caution and / or penalty and the subsequent refusal to collect non-conforming bins. Further actions may be required beyond these measures, and application of methods used successfully in litter enforcement may be warranted.



The use of Waste Collection Permits to regulate procedures and practices are central to implementing successful separate collection systems

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;
- signals to the neighbourhood – though the presence on the pavement of a certain colour of receptacle – that a particular type of collection is imminent;
- 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 code 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 and special arrangements may be required to avoid premature obsolescence of existing receptacles. The scheme chosen is already in place in some locations (Dublin City, Galway).



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

11.4 PAY-BY-USE (DIFFERENTIATED) CHARGES

The optimum charging mechanism for waste will reward those who produce less waste and those who make the effort to 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 a system of Pay-by-Use (PBU) charges (e.g. through a 'pay-by-weight' or 'pay-by-volume' mechanism) since January 1st 2005 is more equitable when there are viable alternatives to disposal in place – i.e. good recycling collections and convenient drop-off points in the form of recycling centres. Upon introduction of use-related charging, the materials can be readily diverted to the recycling system.

Policy in relation to use-related charges – 'Pay-By-Use' - 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 deliver



a collection scheme which operates with a high degree of participation and low levels of contamination.

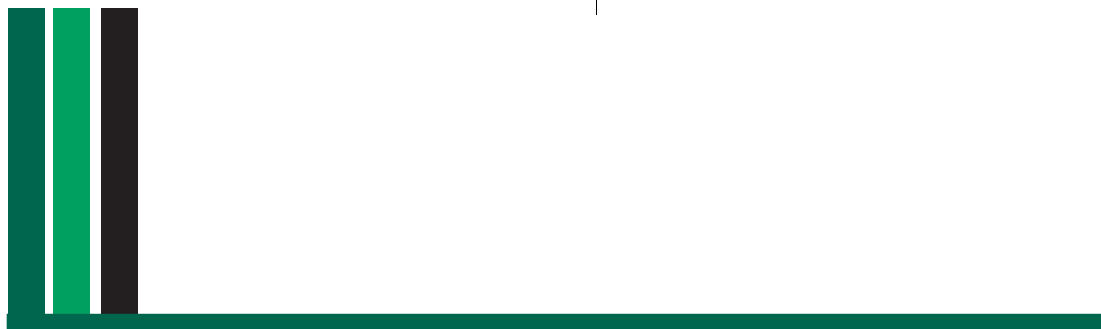
When implementing new facilities and collection schemes, an information programme should be drawn up to meet the following requirements:

- 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; and
- 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

11.6 REVIEW OF REGULATIONS

It is essential that the Waste Management (Collection Permit) Regulations and the Waste Management (Permit) Regulations do not impose unnecessary administrative burdens on operators. In addition, it is imperative that the provisions contained in these Regulations are adequate to achieve their intended purpose. Both sets of regulations are currently under active review. These important Regulations will be examined on a regular basis over the period 2006 to 2016 in order to ensure that the legislative provisions support the objectives of the Strategy to the greatest extent practicable.



12. Restricting Alternative Outlets

12.1 PREVENTING ILLEGAL ACTIVITIES

With a changing waste management system and the 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 have the potential to create serious environmental pollution and can undermine the financial footing for authorised facilities and collections which are provided by legitimate operators.

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

As well as the regulatory measures proposed in the Strategy, public awareness needs to be improved such that the negative consequences of unauthorised activities are highlighted and illegal waste disposal becomes socially unacceptable.

Under the Protection of the Environment Act 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 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 for the implementation of laws concerning illegal dumping and littering, using powers under the Waste Management Acts 1996 to 2005 and the Litter Pollution Acts 1997 and 2003.

In addition to local authority regulation, the Office of Environmental Enforcement took the lead role in consolidating environmental enforcement activity in the State through the establishment of a 'National Enforcement Network'. The function of this Network is to harness the collective resources, expertise and investigative capacity of all the agencies engaged in dealing with environmental crime in Ireland, including the relevant enforcement authorities in Northern Ireland. Concerted enforcement actions undertaken under the auspices of the National Enforcement Network in 2004 and 2005 have shown encouraging results and have succeeded in counteracting large-scale illegal dumping activities.

The allocation of dedicated waste enforcement staff to local authorities, coupled with the efforts of the OEE's Enforcement Network in co-ordinating activities and providing training, means that Ireland is now in a position to better identify and suppress irregular waste movements and illegal waste trafficking.



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 geared towards separate collection and beneficial 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. The Race Against Waste campaign is giving a high



priority to awareness raising on the adverse effects of backyard burning in a message which is designed to make the practice socially unacceptable and to secure its elimination.

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 unauthorised burning of municipal waste will be adopted under the Waste Management Acts 1996 to 2005. 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 or Food Waste Disposal Units are being used increasingly in some household and commercial premises to dispose of organic kitchen waste to the sewer, thus removing the material from the normal solid waste stream and transferring it to the local wastewater treatment plant for treatment. This may have adverse consequences if a treatment plant has not been specifically designed to cater for such additional loads, and in particular the large volumes of organic food waste which the commercial sector is capable of producing. In addition, disposal of organic food waste from the commercial sector by this means is not readily amenable to monitoring and control, with consequent implications for the equitable application of the polluter pays principle to the non-domestic sector. Use of Food Waste Disposal Units in a non-domestic situation is accordingly subject to authorisation under a trade effluent discharge licence, at the discretion of the issuing authority. The ERTDI Programme: 2000 – 2006 issued a *Call for Proposals in the area of Waste and Resource Management* in July 2005. Theme 2 of the Open Call related to *Developing Sustainable Organic Waste Management and Composting*. A Study into Food Waste Disposal Units is now being carried out under the ERTDI Programme and will inform future policy.

12.2 RESTRICTING WASTE DISPOSAL

Presentation of mixed waste for collection and disposal is still a major element of waste management in Ireland. Successful initiatives regarding packaging wastes confirm that a combination of regulatory, producer responsibility and economic instruments can speed up the transition to a 'separate collection' and recycling system.

12.2.1 Disposal Levy

The landfill levy (currently €15 per tonne) will continue to be used to make biodegradable municipal waste (BMW) diversion more financially attractive.



The level of levy will be reviewed on a regular basis 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 for landfill disposal

The Waste Management (Packaging) Regulations 2003 introduced an obligation on all commercial outlets to separate certain categories of packaging waste (including 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; and
- 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 competent authorities – Environmental Protection Agency and local authorities:

- inspection of waste collection companies and enforcement via the Waste Collection Permit;
- verification of 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; and
- inspection of waste that has been presented for compliance with regulatory restrictions and bye-laws.

Where individual regions / counties are well served with viable alternative treatment capacity for the certain categories and streams of biodegradable municipal waste, local authorities are encouraged to introduce appropriate landfill restrictions on a local basis.

13. Market Development

13.1 ACTION PLAN FOR MARKET DEVELOPMENT

Development of markets for the recovered biodegradable municipal waste is key to 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 outcome can be facilitated by market research and development and be best achieved by the waste management industry and the public sector in a partnership approach.

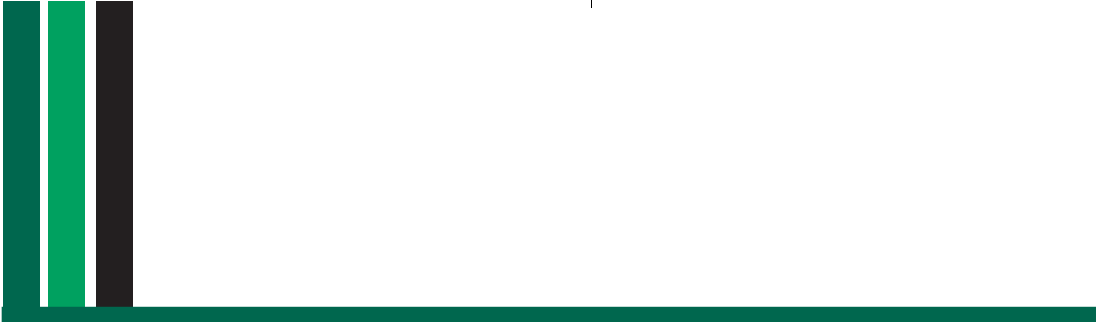
A Market Development Group (MDG) of key stakeholders was established in 2004 under the guidance of the DoEHLG with the objective of driving forward the development of existing markets for recyclables and identifying new applications and markets for recyclables and secondary recycled products. This Group will identify barriers to the use and marketing of recyclable materials and make recommendations to address these.

The Market Development Group is primarily a focused group which is co-ordinated by Enterprise Ireland. It comprises representatives from the EPA, Enterprise Ireland, the National Standards Authority of Ireland and representatives of business and industry interests, as well as the Department of Enterprise, Trade and Employment.

This governmental initiative has similar objectives to the model used for other Groups such as WRAP and REMADE, which were set up to stimulate market development for recyclable materials within the United Kingdom and Scotland respectively.

The Market Development Group intends to focus specifically on those areas which are identified as having the greatest potential. Priority work will include an examination of the optimum mechanisms for the inclusion of environmental considerations within public procurement.

Working sub-committees have been established within the Market Development Group, with participants selected from the wider constituencies of the MDG membership. These sub-committees will investigate the relevant market development issues in relation to the following categories of BMW:

- 
- plastic;
 - organics; and
 - paper / Cardboard.

Progress on the development of markets for recycled paper / cardboard and organic waste will be crucial to the success of this National Strategy on Biodegradable Waste.

Due to the peripherality of Ireland to available markets for recyclables in Europe, synergies which can be achieved through co-operation with the Northern Ireland authorities on an all-island basis can potentially create economies of scale which are necessary for a structured approach to market development initiatives. In this regard, the North-South Ministerial Council established the North-South Market Development Group, formed by the Department of the Environment in Northern Ireland and the Department of Environment, Heritage and Local Government in Ireland.

The North-South Market Development Group – in conjunction with the Waste and Resources Action Programme (WRAP) - has commissioned a Consultancy Study which has an overall objective of determining the feasibility of situating a paper mill on the island of Ireland. Phase 1 of the Project is nearing completion and comprises the development and assessment of paper mill options. In addition, Phase 1 of the Study will also yield the following information which will be of great assistance in future market development initiatives for paper and cardboard:

- review of consumption and demand for paper products on the island of Ireland;
- estimation of the sources, volumes and markets for recovered paper; and
- assessment of the options to utilise recovered paper on the island of Ireland.

Following the completion of Phase 1 of the Study, it is the intention to engage with key stakeholders to assess the level of commercial interest in providing a paper mill in Ireland. It is envisaged that Phase 2 of the Project would provide a detailed feasibility study, including a detailed financial analysis on



the preferred mill or mills identified – following detailed consultation with potential investors, paper companies, development agencies and governments.

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 National Development Plan 2000-2006). 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.

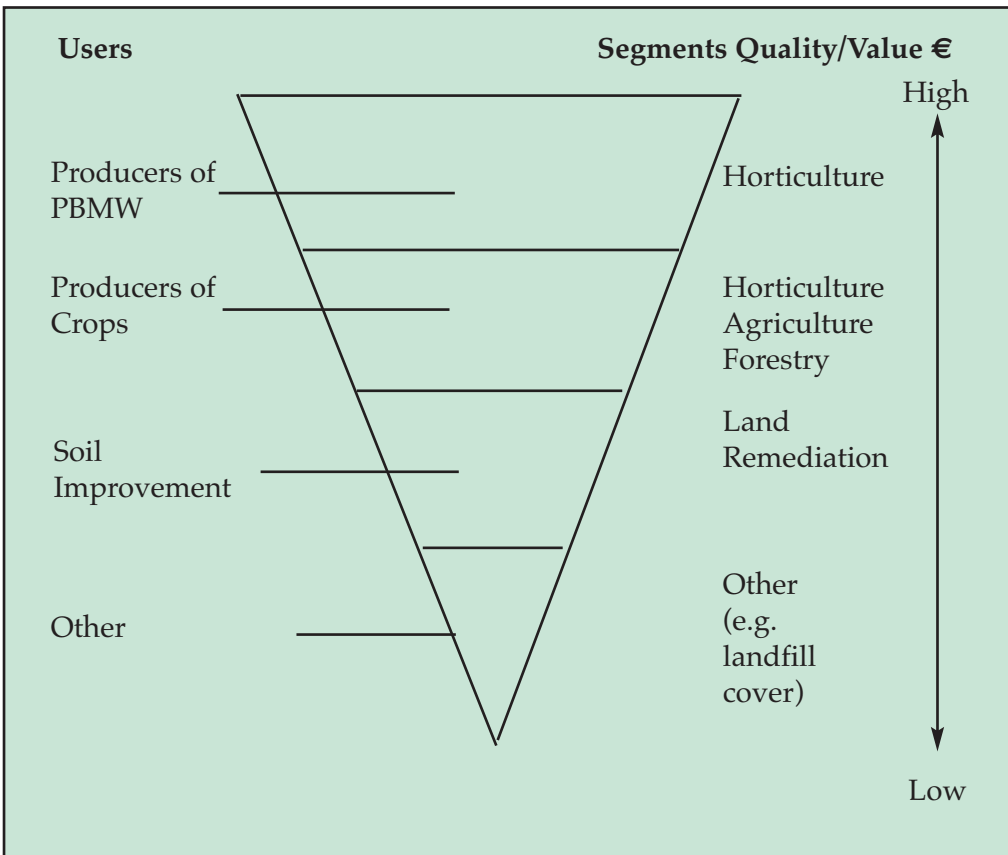


Figure 13.1 ‘Hierarchy’ approach to compost markets.



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 (see Table 13.2).

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 (including general public) • Develop promotion and education programmes for producers of compost



13.2.2 Government-Led Initiatives

Market Development Group

The Market Development Group will bring together the key players and will have an important role in the development of sustainable markets for organic or biowaste materials collected from the municipal waste stream. A special Sub-committee has been established to deal specifically with market development for recovered organic waste.

Irish Compost Quality Standards

A set of national Compost Quality Standards will be developed by a certified Standards Body, in association with the DoEHLG and the industry. These standards will have regard to the Technical Working Document issued by the Sustainable Resources Section of DG Environment on the *Biological Treatment of Biowaste*² and Animal By-products legislation. The National Compost Quality Standards 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 (premium quality), Class 2 compost (good quality) 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 into 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

Key market opportunities include the professional landscaping market, home gardening market and the construction industry market for compost based

² *Biological Treatment of Biowaste*, issued by the Sustainable Resources Section of DG Environment (European Commission), Ref. DG ENV.A.2/LM/biowaste/2nd Draft of 12th February 2001.



products, including pure compost soil amendment, coarse mulches for erosion control, topdressing for lawns, topsoil and potting mixes. In some communities, these outlets provide the entire market for compost made from regional or community-based biowaste composting facilities.

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.

Compost can also be used in organic farming which has shown massive growth in the past 5 years and offers a potential for large scale use of composted biowaste.

The DoEHLG in co-operation with the Department of Agriculture and Food (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 trials in various market sectors; and
- demonstration projects.

Links with International Networks

Much research and practical experience with composting and the use of compost products has been acquired internationally by organisations and institutions such as the UK Waste and Resources Action Programme (WRAP) and the European Composting Network (ECN) etc. Links will be established with these bodies in order to:

- share experiences;
- avoid unnecessary duplication of work already carried out



- internationally; and
- to identify examples of best practice internationally.

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 guidance note issued by the Government Contracts Committee on *Environmental Considerations in Public Procurement* (GCCC 04/04) will assist local authorities in the support of market development for compost.

Summary of Potential Markets

The extent of potential markets as available for municipal biodegradable waste-derived compost – as outlined in the preceding sections – has been summarised in the Environmental Protection Agency ERTDI Study *Assessment and Evaluation of Outlets for Compost Produced from Municipal Waste*. The findings of the Study are reproduced in Table 13.2.





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

Sector	Estimated potential outlets (tpa)	Rationale (abbreviated)
Horticulture	55,000	20% of existing horticulture peat and bark compost usage
Agriculture Conventional	250,000	3% of crop land annually
Organic Farming	64,000	10% of Organic land annually
Land remediation	-	To be determined
Contaminated Lands	-	
Bogland restoration	20,000	To be determined
Forestry	40,000	10% of forestry land annually
Export	18,750	Assumes 5% of 375,000 tonnes 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 be suitable for the intended purpose. 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.

The Composting Association of Ireland will be requested to lead the development of such a guide within the framework of the Market Development Group, with support of the DoEHLG and the EPA in its development and dissemination.



The UK composting industry has adopted a quality assurance scheme, which was developed by the UK Composting Association and 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 a 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 the composting and Anaerobic Digestion 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	Certified Standards Body	2006 - 2007
Market Development in Agriculture and Forestry (R&D and Dissemination)	DoEHLG, DoAF, Teagasc, EPA,	2006-2008
PRI for Peat Extenders	DoEHLG / Peat Industry	2006-2007
Government Procurement Policy	DoEHLG Connaught region (pilot) National	2006 2007
Procurement Handbook	Cré / MDG	2006
Compost Quality Certification Scheme	Cré / MDG	2006 develop 2007 implement
Marketing Plan Handbook	Cré / IrBEA	2006 - 2007



13.3 MARKETS FOR PAPER AND CARDBOARD

The Market Development Group will bring together the key players and will have an important role in the development of sustainable markets for paper and cardboard collected from the municipal waste stream. A special Subcommittee has been established to deal specifically with market development for recovered paper waste.

The outputs from the Paper Mill Feasibility Study commissioned by the North-South Market Development Group will inform future policy. It will also make an important contribution to the knowledge base in relation to the consumption and demand of paper products within Ireland, as well as the sources, volumes and market potential of recovered paper.

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.

13.4 PRODUCER RESPONSIBILITY INITIATIVES (PRIs)

In keeping with the Polluter Pays Principle, the Irish Government has promoted the introduction of Producer Responsibility Initiatives (PRIs) to facilitate better management of priority waste streams such as packaging, farm plastics and waste electrical and electronic equipment. Further such initiatives are emerging for Construction / Demolition Waste, end-of-life vehicles, newspapers and magazines, batteries and tyres.

The PRIs typically emerge as agreed industry schemes 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 in relation to ‘unsolds’.



- **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 and additional measures will be explored through dialogue between the DoEHLG and the publishers, with a view to implementation at an early stage in the life of this Strategy.

In the absence of suitable voluntary agreements, 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.

Unsolicited Mail: Persons can avoid the delivery of unsolicited mail by registering with the Mail Preference Service (MPS), which is a file containing a list of names and addresses of people who do not want to receive direct mail from Irish Direct Marketing Association (IDMA) member companies. IDMA member companies are obliged to suppress their databases using this file (in accordance with the IDMA Code of Practice). Suppressing databases using the MPS file is not a legal obligation and the IDMA Code of Practice does not apply to direct marketing companies that are not IDMA Members. A registration form may be downloaded from the Race Against Waste website <http://www.raceagainstwaste.ie> or obtained through the Irish Direct Marketing Association. If you do not wish to receive unsolicited mail from non-IDMA members you should write to the company and request for your details to be deleted from their databases. They must confirm within 40 days that they have dealt with your request. Please view www.dataprivacy.ie for further information.

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 to be 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 (including separate collection and use-related charging conditions)</p> <p>Formulate and adopt waste presentation Bye-Laws</p> <p>Collect and verify waste data (from collectors and permitted facilities) and report this information to Environmental Protection Agency</p> <p>Co-ordinate and undertake public awareness measures</p> <p>Enforce regulations (including Packaging Regulations, preventing illegal dumping and backyard 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>Implement new waste collection systems (including separate collections and use-related charges)</p> <p>Establish expanded recycling and recovery facilities</p> <p>Establish or access residual waste treatment options</p> <p>Investment in new facilities</p> <p>Report accurate and complete information to local authorities and the Environmental Protection Agency</p>



Body	Role
Environmental Protection Agency	<p>Prepare National Waste Reports</p> <p>Monitor compliance of environmental obligations by local authorities</p> <p>Implement National Waste Prevention policies</p> <p>Adopt role in raising awareness and disseminating information</p>
Individuals and Businesses	<p>Source separation and presentation of recyclable waste streams in accordance with Bye-Laws and instructions issued by waste collectors</p>
Representative Groups	<p>Represent views of stakeholders such as composting or Anaerobic Digestion industry, Non Governmental Organisations etc.</p> <p>Role in raising awareness and disseminating information, and motivating improved performance</p>
Voluntary Recycling Sector	<p>Collection and Reuse / Recycling of materials such as textiles (clothing), books etc.</p>
Other Government Departments and Agencies	<p>Department of Agriculture and Food – implement Animal By-Product Regulations, 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> <p>Department of Enterprise, Trade and Employment, Enterprise Ireland – can play a very important role in the activities of the Market Development Group</p>



14.2 IMPLEMENTATION GROUP

A Strategy Implementation Group will be established to co-ordinate the implementation of this Strategy. The Implementation 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; and
- Waste Collection and Recovery Industry.

A number of representative 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.

Bioenergy Strategy Group, an independent Strategy Group set up by the Department of Communications, Marine and Natural Resources and serviced by Sustainable Energy Ireland.

Chartered Institute of Waste Management, an association of waste management professionals.

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

COMHAR - The National Sustainable Development Partnership, which was established by the government in 1999 to provide a forum for national



consultation and dialogue on all issues surrounding the pursuit of sustainable development in Ireland.

The Implementation 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 GROUP

The functions of the Strategy Implementation Group will include:

- monitoring success of implementation vis-à-vis the key performance indicators.
- reporting progress to the Minister for the Environment, Heritage and Local Government.
- 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.
- recommendations to DoEHLG on the following matters:
 - public information campaigns;
 - market development programmes;
 - requirement for waste regulations and enforcement measures; and
 - legal / operational / competition / economic issues arising in the implementation of the Strategy.
- arranging for success stories in exemplary biodegradable waste management to be documented as case studies and widely disseminated.

14.4 KEY PERFORMANCE INDICATORS

The scale of the challenge in meeting the landfill diversion targets will be greatly influenced by the quantity of BMW which is generated. The first priority is to ensure that BMW generation rates do not exceed the levels set



out in the Strategy. The quantity of BMW being generated should be monitored on a regular basis and all practicable measures introduced so that the level is reduced to the minimum.

The success of implementation of the management measures for the BMW which is generated will be measured against the rates of recycling and recovery for various materials, and ultimately the amount of BMW sent to landfill. Measurement of home composting activities should have regard to any guidance issued by the Environmental Protection Agency on this subject.

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 Report publications. 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.

The Strategy will be reviewed at regular intervals and will be subject to further development which will be designed to deliver the principal objectives and targets set out in this document.

Table 14.2 Summary of Instruments and Initiatives Proposed

Instrument	Responsible Body	Time-frame
Landfill Tax	DoEHLG	Ongoing, annual review
Regulations banning materials from mixed collection and landfill	DoEHLG	Office Paper 2006 Green Waste 2007 Food Waste 2008
Producer Responsibility Initiatives	DoEHLG	Agree PRI with relevant sectors by end 2006

Instrument	Responsible Body	Time-frame
Ban on Illegal burning	DoEHLG – legislation Local Authorities - enforcement	Legislation in 2006
Necessity for further constraints on in-sink disposal of food waste through Food Waste Disposal Units	ERTDI Study to be undertaken in 2006	Issue to be Reviewed in 2006 – Implementation of Findings in 2007
Waste Collection Permits	Local Authorities / Regions	Review Permits in 2006 setting targets and requirements for separate collection schemes
Waste Bye-laws	Local Authorities / Regions	Draft Bye-Laws in 2006 that support Waste Collection Permit requirements
Colour Coding of Recycling Containers	Local Authorities / Regions	Introduce in 2006 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 still only in its early years of implementation, therefore significant improvement in reporting by waste contractors is expected in the coming 12 months.

Areas where both the public and private sectors require improvements to 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, and extent of, 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 necessary to build upon the study being carried out on behalf of the Environmental Protection Agency *Programme for Municipal Waste Characterisation Surveys*. Composition breakdown can be calculated on the output of individual material categories over a specific period, based on weighbridge records, as well as the sorting and characterisation of incoming loads which are delivered in commingled form.

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 category should be recorded, as well as customer numbers and other information which can contribute towards improved customer service and performance.

Waste Collection Services - Ongoing waste composition surveys in accordance with EPA requirements for the National Waste Report 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) beyond the projections contained in the original suite of Waste Management Plans.
- 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 Ireland to serve the needs of the various regions in accordance with the principles contained in the Ministerial Direction on the Inter-Regional Movement of Wastes. Such an approach should enable greater competition among facility operators and provide a more robust set of recovery facilities.
- 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.

Each Annual Implementation Report to be prepared by local authorities on the implementation of the Waste Management Plan, as required under Key Point 13 of *Waste Management: Taking Stock and Moving Forward*, should record progress made in relation to the *National Strategy on Biodegradable Waste* over the previous year. The format to be followed in the Annual Implementation Report will be specified in a Circular letter issued to all local authorities by the DoEHLG.

Table 14.3 -Performance Indicators for Monitoring Strategy Implementation

Indicator (all data in tonnes)	Status 1995	Status 2004	Target 2010	Target 2013	Target 2016
Total BMW Produced	1,289,911	1,935,214	2,379,516	2,374,541	2,268,731
Target for Minimum Total BMW Diverted					
• Amount	142,591	630,788	1,412,083	1,729,585	1,817,262
• %	11.1%	32.6% (Actual)	59.3%	72.8%	80.1%
Target for Maximum Total BMW Landfilled	1,147,320 (Actual)	1,304,426 (Actual)	967,433 (75% of 1995 Arisings)	644,956 (50% of 1995 Arisings)	451,469 (35% of 1995 Arisings)
Home Composting		10 % of suitable households	96,608	96,406	110,532
Biological Treatment					
• Tonnage treated		83,505 10.7%	241,521 25%	318,140 33%	331,597 36%
Textiles Reuse and Recycling		6.7% reuse / recovery 10,535	15% reuse / recovery 28,519	20% reuse / recovery 37,945	25% reuse / recovery 45,318
Recycling Paper and Cardboard					
• Tonnage recovered		375,597	572,702	675,414	665,173
• % Recovery		45.7%	55%	65%	67%
Wood					
• Tonnage recovered		161,150	163,829	163,490	164,880
• % Recovery		91.9%	90%	90%	95%
Minimum Residual Waste Treatment			308,904	438,190	499,762
• Total			13.0% of total BMW arisings	18.5% of total BMW arisings	22.0% of total BMW arisings

Quantities of municipal biodegradable waste arisings for 1995 and 2004 are based on the official returns made during the preparation of the 1995 National Waste Database Report and 2004 National Waste Report, with recalculations applied to take account of improved information and knowledge available since the publication of the original 1995 NWD Report. Estimated quantities of biodegradable municipal waste generation in future years are based on economic growth projections, population forecasts and the anticipated level of success of the National Waste Prevention Programme. These figures assume that the proportion of the various materials present within biodegradable municipal waste – paper / cardboard, textiles, organic waste and wood – remains substantially the same between 2003 and 2016.

Abbreviations

AD	Anaerobic Digestion
AER	Annual Environmental Report
BIM	Bord Iascaigh Mhara
BMW	Biodegradable Municipal Waste
CIWM	Chartered Institute of Waste Management
Comhar	The National Sustainable Development Partnership
Cré	The Composting Association of Ireland Teoranta
DETE	Department of Enterprise, Trade and Employment
DoAF	Department of Agriculture and Food
DoEHLG	Department of Environment, Heritage and Local Government
EPA	Environmental Protection Agency
ERTDI	Environmental Research Technological Development and Innovation Programme
GDP	Gross Domestic Product
GNP	Gross National Product
IPPC	Integrated Pollution Prevention and Control
IrBEA	Irish Bio-Energy Association
IWMA	Irish Waste Management Association
MBT	Mechanical Biological Treatment
PBMW	Putrescible Fraction of Biodegradable Municipal Waste
PBU	Pay By Use
PPP	Public Private Partnership (approach taken to public procurement policy)
PRIs	Producer Responsibility Initiatives
SEI	Sustainable Energy Ireland
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 between 65%-75%.

Biowaste: Source segregated household or commercial waste of an organic or putrescible character, such as food or garden waste.

Biodegradable Municipal Waste: 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 conveniently-situated 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 biowaste 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 categories 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 regular or additional fuel or is disposed of at a plant along with other substances where



energy generation or production of material products 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 for the composting of biowaste by a group of people in a locality with the aim of composting their own and other people's biowaste in order to manage the supplied biowaste as close as possible to the point at which it was produced.

Compost: the stable, sanitised and humus-like material rich in organic matter and free from malodours, 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 and under controlled conditions in order to produce compost.

Compost Quality Standards: a set of industry technical standards, which may be statutory in nature, and which are designed to safeguard against potentially harmful aspects of compost production and use, thereby resulting in high quality compost and protecting 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.

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.

IPPC 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: means the collection of biodegradable waste separately from other kinds of waste from outside private households 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, usually employing separate bins for dry recyclables and organic waste.

Landfilling: the disposal of waste at a facility used for the deposit of waste onto, in 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 greenhouse 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 remitted to the Environment Fund for disbursement on approved environmental activities, thereby forming part of a policy aimed at providing more incentives for re-use and recycling of waste.

Materials Recovery Facilities: a central facility where discarded recyclable waste materials may be taken for segregation and pre-treatment.

Mechanical-Biological Treatment: the treatment of residual municipal waste, in order to stabilise and reduce the volume of waste which requires disposal. A combination of mechanical processing and biological stabilisation are employed.

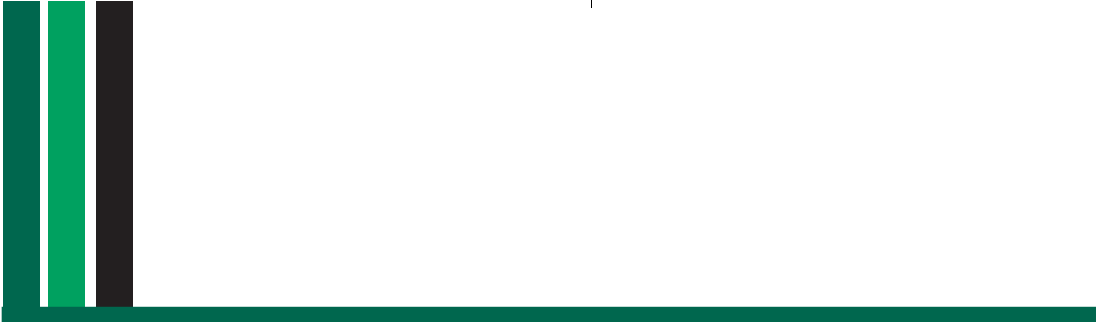
Multi-Story Dwellings: dwellings consisting of numerous floors and occupied by more than one family.

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 Ireland, in accordance with the EU target to reduce emissions by 8%, as part of the Kyoto Protocol of 1997.

National Waste (DataBase) Report: a national report, published by the Environmental Protection Agency, that provides information on waste generation, waste management and waste infrastructure in Ireland. [The official title has been changed to National Waste Report since the edition for year 2004].

Organic Waste: also known as putrescible waste or biowaste, organic waste means "any waste that is capable of undergoing anaerobic or aerobic



decomposition through a biological treatment process, such as food and garden waste”.

Pay-By-Use (PBU) Schemes: schemes whereby residents pay in direct proportion to the amount of waste collected from individual households. This scheme is devised to offer financial incentives for residents to reduce the amount of waste which is presented for collection and subsequent management 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 industry with the agreement of the Government and generally having a requirement to take steps for the purpose of the prevention, minimisation, limitation or recovery of waste as respects the class or classes of product to which the requirement relates and may include a requirement to achieve specified targets in relation to those matters, in line with the ‘Polluter Pays Principle’.

Quality Assurance Schemes: are usually non-statutory in nature, and designed to ensure that producers maintain a large degree of control over 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 high quality recovery or recycling.

Separate Collection: the separate collection of certain categories of biodegradable municipal waste, such as paper/ cardboard and organic 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 under strictly controlled conditions in order to recover energy through the generation of heat or electricity or to produce a synthesis gas which is suitable for combustion and to reduce the bulk of the waste, 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 and have been applied in the UK, devised to minimise the cost of meeting the Landfill Directive targets whilst giving local authorities the greatest amount of flexibility. An allowance to landfill a certain amount of waste is issued to the landfill operator – exceeding this amount requires the purchase of ‘surplus’ 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 a local authority or private sector operators determine waste charges for various waste management services undertaken within a particular administrative



area, designed to promote best practice in prevention, recycling and biological treatment among producers. Pay-by-Use is a form of variable charging.

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 issued a permit which allows operation within a local authority functional area for the collection of waste.

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

Waste Management Plans: statutory waste management plans adopted by local authorities which have generally been 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 or combined heat and power



through integration with district heating systems.

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.