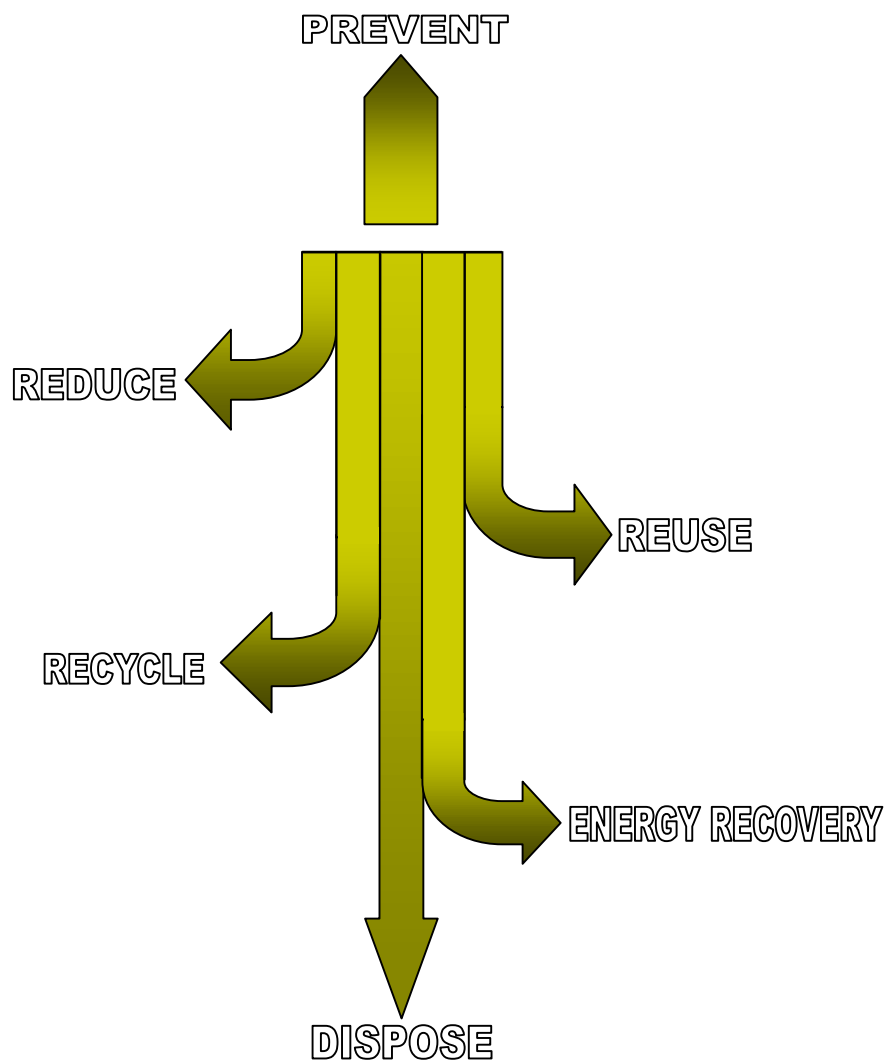


Municipal Solid Waste – Pre-treatment & Residuals Management

An EPA Technical Guidance Document

- CONSULTATION DRAFT -



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Municipal Solid Waste – Pre-treatment & Residuals Management

An EPA Technical Guidance Document

Purpose

The purpose of this consultation document is to seek stakeholder views in relation to a proposed EPA definition of minimum acceptable pre-treatment for Municipal Solid Waste accepted for landfilling or incineration at EPA licensed waste activities. This initiatives set out in this consultation document are intended to assist delivery of Irelands obligations under the EU Waste Framework Directive (2006/12/EC), the EU Landfill Directive (1999/31/EC), and the EU IPPC Directive (96/61/EC).

On foot of the publication of a final version of this proposed technical guidance document, the EPA will commence an exercise of reviewing conditions in existing EPA licences for waste activities. The purpose of this review will be to update and reinforce these licences to the extent necessary to ensure that the regulatory system in place is positioned to contribute effectively to Ireland's efforts in meeting its obligations under EU waste policy as set out herein.

Comments on this Consultation Document should be forwarded to:

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and should arrive no later than 13th October 2008.

Background

This Guidance Note is issued by the Environmental Protection Agency (EPA) as associate guidance in support of its formal sectoral guidance notes on the determination of national Best Available Techniques (BAT) for the waste sector (Landfill BAT, Waste Transfer BAT, Composting BAT, etc.). In particular, this guidance addresses aspects of municipal solid waste pre-treatment for the waste landfilling, waste incineration and waste treatment industries.

This guidance provides a framework for decision making in relation to the achievement of national and European legislative and policy obligations – in particular those obligations in the *Landfill Directive* (1999/31/EC) regarding waste acceptance and pre-treatment. For waste to energy (incineration) activities this note similarly provides a basis for evaluation of the waste acceptance policy against the obligations under BAT, as well as under EU waste policy. The essential objectives of waste pre-treatment are to enhance recycling and recovery of resources, and to reduce the environmental pollution potential of waste residuals disposed to landfill and other final disposal solutions.

This Guidance Note will be periodically reviewed and updated as required to reflect any changes in technologies, legislation and/or policy in order to incorporate advances or directions as they arise. Treatment techniques and standards identified in this Guidance Note are considered best practice at the time of writing. The EPA encourages the development and introduction of new and innovative technologies and techniques which meet legislative, policy and BAT criteria, and looks for continuous improvement in the overall environmental performance of the sector's activities in the context of sustainable development.

Best Available Techniques (BAT)

BAT was introduced as a key principle in the *IPPC Directive* (96/61/EC). This Directive has been enacted into Irish law by the *Protection of the Environment Act 2003*. This implementing legislation extended the concept of BAT to all facilities authorised under the *Waste Management Acts (WMA) (1996-2008)*, regardless of whether or not they were included in Annex I of the IPPC Directive. Thus, for activities regulated by these Acts, BAT must be applied. Best available techniques (BAT) is defined in Section 5(2) of the *WMA 1996-2008*.

Section 40(4) of the *WMA 1996-2008* requires that appropriate controls be identified for specified waste activities in order to prevent emissions and to protect human health and the environment from pollution. The essence of BAT is that the selection of techniques to protect the environment should achieve an appropriate balance between realising environmental benefits and the costs incurred by the person carrying on the activity. In the identification of BAT, emphasis is placed on pollution prevention techniques, including *cleaner technologies* and *waste minimisation*, rather than end-of-pipe treatment.

In determining BAT, applicants for waste licences must demonstrate that due account has been taken of:

- the hierarchy for waste management, including waste prevention as the priority, followed by waste recovery and finally safe disposal of any remaining non-recoverable wastes; and
- relevant waste management plans.

EU Waste Policy

Following on from the implementation of the EU Waste Framework Directive in 1977¹, the European Commission set out its Community-wide waste policy in the *Community Strategy for Waste Management of 1989* (SEC(89) 934 Final 1989). This document, which has its foundations in the EU Waste Framework Directive, is the cornerstone of European waste policy. A revised version of the strategy was adopted by the Commission in July 1996. Central to EU policy was the articulation of a waste hierarchy (Figure 1): this hierarchy gives substance to the obligations set out in Article 3 of the Waste Framework Directive. Drawing on the precautionary principle, the waste hierarchy prioritised the prevention and reduction of waste, then its reuse and recycling and lastly the optimisation of its final disposal. The concept is often described by the “4Rs” – Reduce, Reuse, Recycle, and Recover; followed by unavoidable disposal.

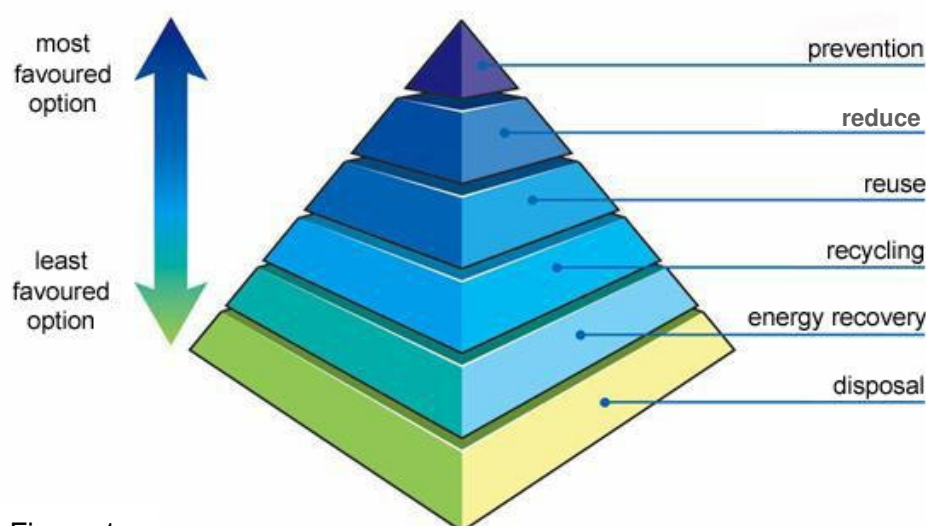


Figure 1

The hierarchy encourages the adoption of options for managing waste in the following order of priority:

- Waste should be prevented or reduced at source as far as possible;
- Where waste cannot be prevented, waste materials or products should be reused directly, or refurbished then reused;
- Waste materials should then be recycled or reprocessed into a form that allows them to be reclaimed as a secondary raw material;

¹ Directive 75/442/EEC, subsequently replaced by the re-codified edition, Directive 2006/12/EC

- Where useful secondary materials cannot be reclaimed, the energy content of waste should be recovered and used as a substitute for non-renewable energy resources;
- Only if waste cannot be prevented, reused, reclaimed or recovered, should it be disposed of into the environment by landfilling, and this should only be undertaken in a controlled manner.

This hierarchy is given further authority in the current text of the proposed revision to the Waste Framework Directive (c.f. EU Commission, 2008) where it is incorporated into the draft legislation as a legal obligation for Member States. Moreover, the draft text of the proposed revision to the Waste Framework Directive empowers the Commission to bring forward specific targets for recycling and recovery of different waste streams (over and above those currently published such as for packaging waste and WEEE).

Irish Waste Policy

In Ireland a comprehensive policy framework for modernising the approach to waste management was put in place in 1998 in the form of the Policy Statement “*Waste Management: Changing our Ways*”. In summary, the policy was based on the “integrated waste management” approach, having regard to the internationally adopted hierarchy of options (articulated above). The policy context was strengthened in 2002 with the publication of *Preventing and Recycling Waste: Delivering Change* and again in 2004 with the publication of *Waste Management – Taking Stock and Moving Forward*.

This policy has been underwritten by a variety of statute which significantly influences how waste streams are managed in Ireland. These legal instruments directly influence the market from the point of view of how products are made, to how they are managed at end of life (e.g., Waste Management Acts 1996-2008, Landfill Tax, Plastic Bag Levy, WEEE Regulations, Restriction of use of Hazardous Substances Regulations, Waste Oils Regulations, Waste Tyre Regulations, PCB Regulations, etc.). There is a large body of legislation in the area of waste management that tackle the issues of waste from a generic perspective; to a waste stream perspective; to a substance perspective. Many of the recent legislative initiatives have been addressed to producer responsibility (e.g. WEEE, End of Life Vehicles, Tyres, Packaging, etc.). In addition to the legislative initiatives, Government has developed policy and guidance on national best practice (e.g. Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects were published in July 2006). Government has also developed policy that addresses EU waste management requirements such as that for biological waste management² (c.f. next section).

² The National Strategy on Biodegradable Waste, April 2006. DoEHLG.

EU Landfill Directive Obligations (1999/31/EC)

This directive, which came into effect on 16th July 2001, was transposed into Irish law through SI 336 of 2002³ and SI 337 of 2002⁴. These Regulations were later replaced by the Waste Management (Licensing) Regulations 2004 (SI 395 of 2004). The EU Landfill Directive, amongst other matters, sets out a number of obligations in relation to waste acceptance at landfills: the principal obligation being that operators of landfills are not able to accept waste unless it has been pre-treated. These waste diversion and pre-treatment obligations are set out in Articles 5 & 6 of the Landfill Directive (1999/31/EC).

Under Article 6 of the Landfill Directive, a landfill operator will have to be able to demonstrate that all waste accepted at the landfill has been subjected to pre-treatment. This is binding from 16th July 2001 for any facilities commenced since that date, and imposes a binding obligation effective on the 16th July 2009 for all landfill facilities operational at the time of transposition of the Directive (16th July 2001).

Article 5 of the Directive sets out specific pre-treatment obligations for biodegradable municipal waste (BMW). These biowaste diversion obligations are a sub-set of the waste treatment requirements, and have specific limitations in respect of the tonnage of biowaste that can be accepted at landfills. These limitations – which are tied to a 1995 statistical base year for waste production in Ireland⁵ – are staggered, with each iteration possessing a stricter obligation in relation to diversion. Ireland negotiated with the EU Commission a four year extension to the first two compliance dates specified in Article 5 (2006 to 2010, and 2009 to 2013 respectively). These obligations can be summarised as follows (refer also Figures 2 and 3):

- By 1st January 2010 Ireland can only landfill a maximum 75% of the BMW generated in 1995, i.e. a national maximum of 967,443t BMW can be landfilled. Based on current waste growth trends this, in 2010, will equate to a requirement that approximately 50% of all BMW accepted at a landfill facility for disposal must be biologically pre-treated (including diversion).
- By 1st January 2013 Ireland can only landfill a maximum 50% of the BMW generated in 1995, i.e. a national maximum of 644,956t BMW can be landfilled. Based on current waste growth trends this, in 2013, will equate to a requirement that approximately 70% of all BMW accepted at a landfill facility for disposal must be biologically pre-treated (including diversion).
- By 1st January 2016 Ireland can only landfill a maximum 35% of the BMW generated in 1995, i.e. a national maximum of 451,469t BMW can be landfilled. Based on current waste growth trends this, in

³ Waste Management (Licensing)(Amendment) Regulations 2002

⁴ European Communities (Amendment of Waste Management (Licensing) Regulations 2000) Regulations 2002

⁵ National Waste Database Report for report year 1995, EPA 1996

2016, will equate to a requirement that approximately 90% of all BMW accepted at a landfill facility for disposal must be biologically pre-treated (including diversion).

BMW Generation - Baseline (1995)		
		Quantity generated (tonnes)
1995		1,289,911

BMW Landfilled - Current Position		
		Quantity landfilled (tonnes)
2004		1,304,426
2005		1,307,570
2006		1,422,432

BMW Landfill Obligations		
Year	Landfill Directive Obligations	Maximum quantity allowed to be landfilled (tonnes)
2010	75% of quantity generated in 1995	967,433
2013	50% of quantity generated in 1995	644,956
2016	35% of quantity generated in 1995	451,469

Figure 2: National obligations for BMW diversion from landfill (Source EPA⁶)

National Strategy on Biodegradable Waste

The National Strategy on Biodegradable Waste² sets out measures to progressively divert biodegradable municipal waste from landfill in accordance with the obligations specified in EU Directive 1999/31/EC on the landfill of waste.

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

- employment of 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;

⁶ National Waste Database – A Report for the Year 2006. EPA 2007

- 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.

The initiatives set out in this technical guidance note are consistent with this stated policy.

EPA Guidance & Statistics

The recently published EPA discussion document on national BMW objectives *Hitting the Targets for Biodegradable Municipal Waste: Ten Options for Change*⁷ reaffirms the pressing need for the State to grapple with this issue of diversion. That discussion document - in the context of the requirements of the EU Landfill Directive (1999/31/EC) - reviews the way Ireland currently manages the Organic Fraction of BMW (OFBMW). The intention of the document is to broaden the public discussion to include wider market issues, rather than focus solely on narrower topics such as specific technologies. The discussion document suggests ten possible public policy interventions to encourage changes in management practices for BMW:-

1. Promote at-source composting
2. Expand R&D for at-source composting
3. Ban the landfill of untreated municipal waste
4. Increase the landfill levy
5. Undertake market research for treated OFBMW products
6. Provide a subsidy for the treatment of OFBMW
7. Develop and assign responsibility for a national waste management plan
8. Develop guidance on waste infrastructure and contaminated sites
9. Develop stabilised biowaste standards
10. Encourage green procurement and undertake marketing of OFBMW products

EPA statistics⁶ indicate that there is an increasing trend in the amount of BMW that is being diverted from landfill (38% in 2006, up from 35% in 2005). However these statistics, as supported by EPA-ESRI ISus projections⁸, also indicate a continuing trend of increasing biodegradable municipal waste generation (Figure 3). These projections indicate that Ireland will deviate

⁷ Hitting the Targets for Biodegradable Municipal Waste: Ten Options for Change. Irish EPA, 2008.

⁸ EPA sponsored ERSI research on waste generation projections.

See http://www.esri.ie/research/research_areas/environment/isus/

significantly from the position required by the EU Landfill Directive and articulated in the National Biodegradable Waste strategy (NBWS)², unless urgent action is now taken.

BMW Projections and Obligations

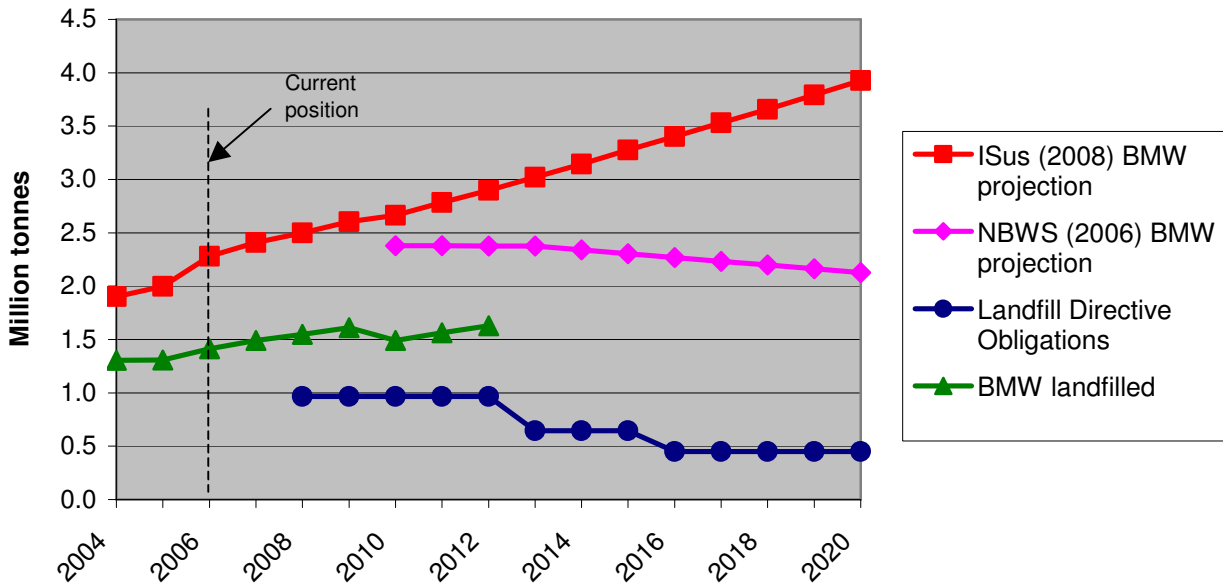


Figure 3: Biological Municipal Waste Forecasts (sources DoEHLG², & EPA-ESRI ISus projections⁸).

The result of this projected growth indicates large gaps between the reduction obligations Ireland is required to achieve and where it will stand unless urgent action is taken (see Figure 4).

Year	Maximum quantity of untreated BMW allowed to landfill	BMW 'Distance to Objective' (Gap Analysis)	
		'Standstill' position (gap) based on 2006 figures	Position (gap) based on ISus ⁸ waste projections
2010	967,000t	455,000t	672,000t
2013	645,000t	777,000t	1,209,000t
2016	451,000t	971,000t	1,603,000t

Figure 4: BMW Gap analysis. (Assumes no incineration capacity comes on line)

There will have to be some fine tuning of these obligations depending on the biodegradable municipal waste generation statistics for years 2007 to 2009, however it is not expected that there will be any significant data swing in this period.

EPA Licensing

The EPA consistently reflects National and EU policy in its administration of the Waste and IPPC regulatory regime. Licences issued to date by the EPA specify general requirements for licensees to report on their contribution to national waste policy.

The primary intent of the waste acceptance & pre-treatment conditions in a waste licence is two fold:

- 1) the reduction/elimination of disposal of biodegradable waste to landfill - this waste is leachate forming, and also generates landfill gas which is a harmful greenhouse gas composite and is also odorous (potentially nuisance forming); and
- 2) the promotion of waste pre-treatment to ensure extraction from the waste disposal stream of recyclable/recoverable resources, including energy.

These conditions are intended to reflect, in particular, recitals 2, 5 & 6⁹ of the EU Waste Framework Directive (2006/12/EC), as well as recitals 2, 8, 16 & 17¹⁰ of the EU Landfill Directive (1999/31/EC). In short, these pre-treatment conditions have a primary objective of achieving a more responsible approach to the management of waste and in particular to a final disposal solution for residual waste.

It is now considered necessary to examine the waste pre-treatment conditions articulated in all operational landfill licences (granted since the coming into effect of the current national waste licensing system (1997)). This

⁹ (2) The essential objective of all provisions relating to waste management should be the protection of human health and the environment against harmful effects caused by the collection, transport, treatment, storage and tipping of waste.

(5) The recovery of waste and the use of recovered materials as raw materials should be encouraged in order to conserve natural resources. It may be necessary to adopt specific rules for reusable waste.

(6) In order to achieve a high level of environmental protection, Member States should, in addition to taking responsible action to ensure the disposal and recovery of waste, take measures to restrict the production of waste particularly by promoting clean technologies and products which can be recycled and reused, taking into consideration existing or potential market opportunities for recovered waste.

¹⁰ (2) Whereas the Council resolution of 9 December 1996 on waste policy considers that, in the future, only safe and controlled landfill activities should be carried out throughout the Community.

(8) Whereas both the quantity and hazardous nature of waste intended for landfill should be reduced where appropriate; whereas the handling of waste should be facilitated and its recovery enhanced; whereas the use of treatment processes should therefore be encouraged to ensure that landfill is compatible with the objectives of this Directive; whereas sorting is included in the definition of treatment.

(16) Whereas measures should be taken to reduce the production of methane gas from landfills, *inter alia*, in order to reduce global warming, through the reduction of the landfill of biodegradable waste and the requirements to introduce landfill gas control.

(17) Whereas the measures taken to reduce the landfill of biodegradable waste should also aim at encouraging the separate collection of biodegradable waste, sorting in general, recovery and recycling.

examination will result in an updating and reinforcing of licence conditions to the extent necessary to ensure that the regulatory system in place can contribute in a more effective and focused way to Ireland's efforts in meeting obligations established by (i) the Landfill Directive, (ii) EU waste policy, and (iii) BAT.

There are 29 operational MSW landfill sites in Ireland and a further 6 with licences but which have not yet commenced operations. These will be included in this examination process.

There are no MSW Incinerators operational in Ireland (two have operating licences but have not yet commenced). This pretreatment document also establishes minimum pre-treatment obligations for such incineration plants when operational.

The following sections of this guidance note present and discuss the pre-treatment options considered necessary in order to ensure compliance with EPA requirements.

What is Residual Waste?

In its most basic meaning, a residue is something 'which is left over': which in the case of a process residue is a material left over from a process.

In Canada, a published definition for Residual Waste is given as,

*Common waste generated by industry, business, institutions and houses that remains after diversion programmes have been used to remove recoverable materials.*¹¹

Smith & Scott (2005)¹² define residuals management as,

the management of waste resulting from waste treatment processes.

In Canterbury, New Zealand, residual waste management is defined as,

*the final treatment and/or disposal of a waste that cannot be used in any other way.*¹³

In the *Waste Management (Facility Permit and Registration) Regulations 2007* (SI # 821 of 2007), residual waste is defined - for the purposes of those regulations - in Article 5(2) as meaning:-

... any fraction of municipal waste remaining after the source separation of municipal waste fractions such as food and garden waste, packaging, paper, metals, and glass.

¹¹ Durham – York Region of Ontario Residuals Waste Study 2006.

¹² Dictionary of Water and Waste Management. Elsevier Press.

¹³ <http://www.ecan.govt.nz/Our+Environment/Waste/The+5+Rs/Residual-waste-mgmt.htm>

In simplest terms, Residual Waste is material left over from a waste pre-treatment / processing step. Accordingly the character of residual waste will be different depending on the point in the waste management chain that is being examined.

Internationally published experience (e.g. EU EA report *Europe's Environment – The Fourth Assessment*) suggests that between 50 and 70% diversion of municipal waste away from incineration and landfill¹⁴ is technically possible depending, primarily, on the participation of the waste producers, the sophistication of the collection services, effective implementation of Government policy, and the waste treatment/management infrastructure in place. The current national municipal waste recovery rate is 36% (c.f. EPA National Waste Report for 2006) which exceeds the '35% by 2013' target set in the Government's 1998 *Changing our Ways* waste policy document. However a higher recovery rate is technically possible, and is now necessary in order to meet EU obligations.

What is Pre-Treatment ?

The pre-treatment of waste can include processes such as:-

- Source separation (e.g. home composting, packaging waste)
- Separate collections (e.g. '2 Bin' or '3 Bin' systems)
- Diversion to non disposal waste management routes
- Manual sorting
- Composting
- Aerobic / Anaerobic Digestion
- Mechanical treatment (crushing, grading, magnetic separation, eddy current separation, ballistic separation, trommeling, sorting, etc)
- Biological stabilization of 'black bin' residues (after mechanical treatment)
- Thermal Treatment
- Energy Recovery.

Waste treatment options thus span the following classes of process: Manual – Mechanical – Biological – Thermal. Acceptable pre-treatment solutions will likely entail a range of these treatments.

Assuming prevention steps have been exhausted, then 'at-source' separation techniques are the next preferred step where technically possible. Market feedback suggests that the highest quality recyclables are generated by 'at-source' separation initiatives, where contamination of recyclable components is prevented.

Currently the waste industry - particularly in urban areas - is arranging itself, where economically possible, to provide integrated waste treatment operations. Collected waste is brought to purpose built factory units with

¹⁴ excluding 'captive' industrial landfills like those attached to mine sites for mineral wastes.

modular waste treatment processes combining all or combinations of, manual, mechanical and biological treatments. Such operations previously referred to as Materials Recovery Facilities, are now often identified as Mechanical Biological Treatment (MBT) facilities.

Detailed presentation and examination of mechanical biological treatments available can be found in the UK Juniper Report and in a Fehily-Timoney research report for the EPA.^{15, 16} The UK Juniper consultants¹⁵ define MBT operations as the *partial processing of mixed household waste by mechanically removing some parts of the waste and biologically treating others, so that the residual fraction is smaller and more suitable for a number of possible uses.* MBT in itself does not result in the final treatment of residual waste.



A number of factors are central to the degree of sophistication applied to waste stream processing, viz,

- the market (e.g. for recyclables traded as commodities, as well as by willingness-to-pay and willingness-to-accept decisions by society);
- state subsidies;
- State waste management policy;
- the geo-social configuration of the waste collection area (e.g. island or city); and
- the regulatory obligations (e.g. packaging waste targets, WEEE and tyres banned from landfill).

In the absence of a regulatory system that specifies mandatory pre-treatment obligations and recycling targets, price is the principal driver in relation to market delivered waste treatment options. Ireland's rural-urban divide will

¹⁵ Juniper's major report on MBT was published in the spring of 2005. Publication available via: http://www.juniper.co.uk/services/Our_services/mbt.html

¹⁶ Fehily-Timoney 2008. Research report entitled 'Critical Analysis of the Potential of Mechanical Biological Treatment for Irish Waste Management. Volume 2, Final, July 2008, Irish EPA.

impact on the potential for the delivery of economically viable and sophisticated waste treatment options into rural areas. Any policy action needed to balance this skewed market is beyond the scope of this document.



This document is not intending to present an exhaustive list of all possible waste treatment processes, but rather, to set out guiding principles for the main end-of-life decisions for residuals from the MSW stream. The application of these principles will permit compliance with the waste pre-treatment objectives specified in EU legislation and policy, as well as compliance with EPA waste licence conditions.

Minimum Pre-Treatment Obligations

The two principal residuals management options are Landfill Disposal and Incineration. Within the EU waste hierarchy and policy, incineration with energy recovery is preferred over landfill.

The flow chart presented in Figure 5 will assist in visualising the main pre-treatment/diversion options.

Landfill

As noted previously, in addition to the bio-waste restrictions, a landfill operator must be able to demonstrate that other waste accepted at the landfill has been subjected to appropriate pre-treatment (c.f. Article 6 of the Landfill Directive). For landfills operational on 16 July 2001¹⁷, the compliance date for this obligation is 16 July 2009; and any landfill that commenced after 16 July 2001 should currently accept only waste that has been pre-treated to an acceptable standard.

¹⁷ date of transposition of the Landfill Directive

Ireland will not meet its national landfill diversion obligations for biowaste unless radical steps are taken to bring on-stream infrastructure that will divert or treat the biodegradable component of residual waste prior to landfilling.

In order to meet the pre-treatment and bio-waste diversion obligations set out in the Landfill Directive and having regard to the principles of BAT, a landfill operator must be able to demonstrate to the EPA that the level of pre-treatment (incl. diversion) of the waste accepted at the facility is sufficient to ensure compliance with the required diversion obligations¹⁸ (refer Figure 2).

The minimum pre-treatment obligations for waste intended to be accepted at MSW landfills are articulated as follows:

- The operator of an existing landfill¹⁹ must demonstrate to the EPA that, by 16th July 2009, all²⁰ waste delivered to the landfill will have been adequately pre-treated (including diversion). The minimum acceptable pre-treatment for MSW landfills would consist of a source separated two-bin system or equivalent. For urban areas, treatment of 'black bin' or mixed municipal waste by mechanical means is also expected. Adequate pre-treatment must include treatment (including diversion) of the biodegradable component of the MSW received at a landfill to the extent necessary to achieve the Landfill Directive diversion obligations (commencing 2010). The minimum treatment obligations set out Figure 6 for biological waste treatment reflect the national biodegradable waste strategy and Landfill Directive obligations. Such pre-treatment facilities could be stand-alone units or be located within existing landfill facilities.
- The operator of a new landfill (including major extensions of same) must demonstrate to the EPA that from commencement of operation all²⁰ waste delivered to the landfill will have been adequately pre-treated. This must include for treatment/diversion of the biodegradable component of the waste received at sites which applied for an EPA licence after the publication of the National Biodegradable Waste Strategy (April 2006). This is considered minimum BAT for such new facilities.

¹⁸ Reduction to 75% of total biodegradable waste produced in 1995 by 2010; Reduction to 50% of total biodegradable waste produced in 1995 by 2013; and Reduction to 35% of total biodegradable waste produced in 2016. c.f EPA National Waste Report for year 2006.

¹⁹ A facility that was operational in July 2001. c.f. Article 14 of the Landfill Directive

²⁰ subject to the qualifications in Article 6(a) of the landfill directive

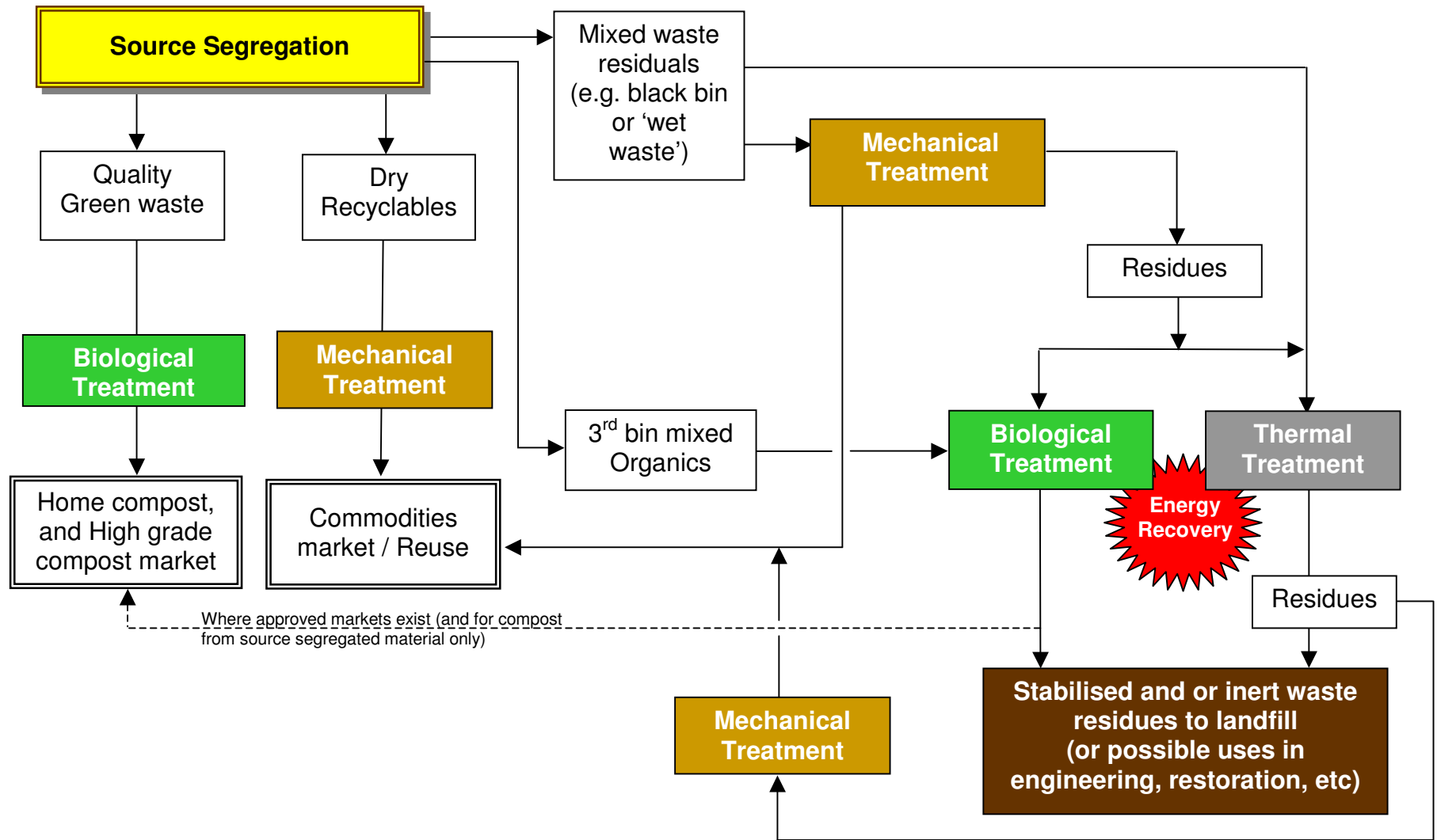


Figure 5: Waste pre-treatment/diversion flow path

Incineration

Under the principles established in BAT as well as in EU legislation and policy obligations, an operator of a waste-to-energy facility (WtE incinerator) must demonstrate to the EPA that what is accepted for combustion has been pre-treated to an acceptable level.

The minimum pre-treatment obligations for waste intended to be accepted at WtE facilities are articulated as follows:

- In the case of WtE incineration a 2 bin source separation or equivalent is again a minimum requirement, as is mechanical treatment of the incinerator residues that will yield marketable recyclable (non-energy) fractions (e.g. metals). Pre-incineration biological treatment of residual waste is not mandatory and would be decided on a case-by-case basis having regard to the environmental and economic efficiency of the proposal.

Refer Figure 6 for a summary of these landfill and incineration pre-treatment obligations.

Validation of Treatment Effort

In the case of a Landfill or a WtE Incinerator operator, the evidence required by the EPA regarding the *appropriate* level of pre-treatment of accepted waste will be based on a site/region specific assessment.

As the waste infrastructure in a region develops over time or new standards are required due to evolving national or EU waste treatment obligations, it will be necessary for landfill and incinerator facility operators to periodically revisit the rationale put forward by them in relation to confirming to the Agency that adequate and appropriate pre-treatment effort has been applied to a standard acceptable to the EPA. In any case, the Annual Environmental Report for each facility licensed by the EPA, will have to present sufficient detail on waste acceptance and audit policy to satisfy the EPA that only pre-treated waste has been accepted at the facility.

The EPA is currently developing an updated waste characterisation protocol which will assist determination of the success or otherwise of waste diversion efforts when applied to the character of waste accepted at a landfill.

**Figure 6: Generic - Facility Type – Municipal Solid Waste
Pre-treatment Obligations**

Principal Disposal Route	Minimum Pre-Treatment required	Required Material Diversion	Date
Landfill	1. 2 Bin collection system	Dry Recyclables	16-7-09 for a landfill existing on 16-7-2001 16-7-2001 for all other landfills (including major extensions)
	2. Mechanical treatment of black bin (in large urban centers)	Metals SRF ²¹	
	3a. Diversion of biowaste from disposal stream, and/or 3b. Treatment of the biological element of 'black bin' pre landfilling	Biodegradables	2010, 2013 & 2016 for all landfills accepting MSW to the extent necessary to achieve the diversion obligations. Viz, <ul style="list-style-type: none"> - By 1st January 2010 a minimum of 50% of all BMW accepted at the facility shall be biologically pre-treated (including diversion). - By 1st January 2013 a minimum of 70% of all BMW accepted at the facility shall be biologically pre-treated (including diversion). - By 1st January 2016 a minimum of 90% of all BMW accepted at the facility shall be biologically pre-treated (including diversion).
WtE Incinerator	1. 2 Bin collection system	Dry Recyclables	Prior to commencement of any MSW incinerator
	2. Mechanical treatment of incinerator ashes	Metals Other marketable recyclables	

²¹ SRF – Solid Recovered Fuel

In addition, the EPA will identify test methods to assist operators in demonstrating the effectiveness of any treatment applied to BMW in respect of the biodegradable component. Such methods will likely be based on respirometry, or equivalent. Different standards will be developed for compost to be used in horticultural/landscape applications, as well as for stabilised biowaste (residual waste) intended to be placed in a landfill. Such protocols will be notified to holders of EPA waste licences as they are developed.

In the case of Stabilised Biowaste the following standard will be applied by the EPA (unless otherwise agreed in writing):

‘stabilisation’ means the reduction of the decomposition properties of biowaste to such an extent that offensive odours are minimised and that either the Respiration Activity after four days (AT₄) is below 10 mg O₂/g dm or the Dynamic Respiration Index is below 1,000 mg O₂/kg VS/h²²

Concluding Comments

Ireland will not meet its obligations in relation to pre-treatment of municipal solid waste prior to landfilling or incineration if action is not taken to provide the waste source-separation and treatment infrastructure necessary. Accordingly, any new landfill or incinerator proposal will have to be planned in the context of the availability of appropriate waste pre-treatment facilities (including diversion infrastructure). Such a situation would represent BAT. The requirement for an integrated approach to waste management and the provision of essential waste management infrastructure has been well flagged in published Government waste policy since 1998, and in EPA National Waste reports for successive years.

This technical guidance note establishes the EPAs’ minimum expected standards of pre-treatment of municipal solid waste prior to landfilling and incineration. It is expected that these standards will assist Ireland in meeting its obligations as defined in EU waste management legislation and policy.

This pre-treatment note will be subject to periodic review as required. Separate guidance may issue in relation to the pre-treatment of waste streams not included in the general scope of Municipal Solid Waste (e.g. municipal and industrial organic sludges).



²² from the EU Working Document on Biological Treatment of Biowaste 2nd Draft

ANNEX 1

Glossary

Biodegradable means waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and cardboard, etc.

Biodegradable Municipal Waste (BMW) means the biodegradable component of municipal waste. Biodegradable municipal waste is typically composed of food and garden waste, wood, paper, cardboard and textiles. Approximately 74% of the household and commercial waste managed in Ireland in 2006 was biodegradable.

Biological Treatment means composting, anaerobic digestion, mechanical-biological treatment or any other biological treatment process for stabilising and sanitising biodegradable waste, including pre-treatment processes.

Biowaste means household, commercial or industrial waste of an organic or putrescible character.

Mechanical-Biological Treatment (MBT) means the treatment of residual municipal waste through a combination of manual & mechanical processing and biological stabilisation, in order to stabilise and reduce the volume of waste which requires disposal.

Municipal Solid Waste (MSW) means household waste as well as commercial and other waste which, because of its nature or composition, is similar to household waste. It excludes municipal sludges and effluents.

OFBMW Organic Fraction of Biodegradable Municipal Waste

Residual Waste means the fraction of collected waste remaining after a treatment step, which generally requires further treatment or disposal.

Treatment / pre-Treatment includes, in relation to waste, any manual, 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.



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