



Review of
Kildare Waste Management Plan
2005 - 2010
Waste Policy and Legislation &
Developments in Waste Management Techniques

Volume 3 of 4

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Abstract: The Waste Management (Planning) Regulations and Waste Management Act set out the statutory information to be contained in a Waste Management Plan. This third volume of the review of the Kildare Waste Management Plan contains generic information which must be included in a Plan but it not necessarily specific to County Kildare. Areas covered include waste legislation and policy, packaging waste, National Hazardous Waste Management Plan, National Biodegradable Waste Strategy and waste management techniques.

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1. WASTE POLICY AND LEGISLATION

1.1. Introduction

Waste management is one of the most tightly-regulated industrial activities. A large number of EU and national laws affect waste management in a variety of different ways. One objective of this Waste Management Plan is to set out how these different elements affect waste management in County Kildare over the Plan's intended duration, with a view to proposing an ordered response to them.

The purpose of this Section is to describe the nature of the major regulatory instruments affecting waste management in County Kildare. These will be returned to in Section 7 of Volume 2 of this document, where the anticipated developments stemming from these policy initiatives are analysed. Later on in this Plan, detailed proposals will be set down as to how these developments are to be addressed.

An important part of the final half of this Section is a review of the main statutory requirements on local authorities for the management of wastes within their functional areas. As will be seen, these duties cover such matters as household waste collection, but also extend to the enforcement of certain regulations on holders of particular types of waste. It is necessary to include a comprehensive review of these functions, as Section 22 of the Waste Management Act requires a waste management plan to set out how local authorities will be exercising these statutory powers, including their enforcement functions under the Act, over the Plan period. This Section also highlights specific EU and national legislation which affects the structure and content of a waste management plan.

References to the Kildare Waste Management Plan in this document can be taken to mean the proposed review of the Waste Management Plan, where appropriate.

1.2. EU Waste Policy

In the last decade, Ireland has been increasingly affected by initiatives contained in the EU Environment Programme. A basic framework of EU waste management policy was agreed in the 1989 Community Strategy for Waste Management, being reviewed in 1996 and covering a further five-year period from 1997.

The fundamental principles behind the Community Strategy are set out in a three-level waste hierarchy. This describes the three fundamental concepts behind the EU waste strategy, which are in order of preference:

- waste prevention
- waste recovery (including re-use, recycling and energy recovery, but with a preference to materials recovery)
- waste disposal (which includes incineration without energy recovery and landfill)

Besides these waste-related initiatives, a series of wider Action Programmes on the Environment have been promulgated for the EU as a whole. The most recent is the Sixth Community Environmental Action Programme. This runs for a period of ten years, which commenced on 22 July 2002.

Besides initiatives on other environmental issues – of which climate change is given particular prominence – the Sixth Action Programme indicates the need for further EU waste management initiatives on the grounds that the quantities of waste are still continuing to rise across Europe. Such action is needed not only to enhance levels of environmental protection, but also to deal with the loss of valuable resources implicit in the existence of discarded residuals. In other words, an integrated approach to the issue of wastes and the use of natural resources is being proposed.

Article 8 of the Sixth Action Programme sets down proposals relating to the sustainable use and management of natural resources and waste. Overall, the objective is to ensure that waste prevention initiatives finally start to reduce the steadily-increasing annual waste production level of the EU. Besides prevention, a significant reduction in waste passing to disposal facilities must be achieved, partly by waste re-use and recycling. Reductions in hazardous waste production are endorsed, along with requirements to decrease the 'hazardousness' of hazardous waste.

An integrated product policy approach is to be followed, and the content of the earlier Community Strategy for Waste Management is endorsed by the Sixth Action Programme. Four key priority actions are proposed, along with a series of related sub-objectives. These are summarised in Table 1.1.

Table 1.1: Sixth Environmental Action Programme

Sixth Environmental Action Programme - Waste-Related Objectives (Article 8)	
1).	to develop a thematic strategy on the sustainable use and management of resources, including: <ul style="list-style-type: none"> • drawing up estimates of materials and waste stream flows within, into and out of the Community • reviewing the efficiency and impact of policy measures and subsidies relating to natural resources and waste • establishing goals and targets for resource use, with a view to decoupling the link between economic growth and negative environmental impacts • promoting extraction and production methods to encourage eco-efficiency and the sustainable use of raw-materials, energy, water and other resources • the development and implementation of research, technology transfer, economic and market-based instruments, programmes of best practice and indicators of resource efficiency
2).	to develop and implement measures on waste management and prevention, including: <ul style="list-style-type: none"> • producing a set of quantitative and qualitative reduction targets covering all relevant waste, which are to be achieved at Community level by 2010 • encouraging ecologically sound and sustainable product design • raising awareness of the public's potential contribution to waste reduction • formulating measures to encourage waste prevention, such as by stimulating re-use and recovery, and the phasing-out of certain substances and materials • developing further indicators in the field of waste management
3).	developing a thematic strategy on waste recycling, which is to include: <ul style="list-style-type: none"> • measures aimed at ensuring source separation, the collection and recycling of priority waste streams • the further development of producer responsibility initiatives • the development and transfer of environmentally sound waste recycling and treatment technology
4).	developing or revising the legislation on wastes, including that relating to: <ul style="list-style-type: none"> • construction and demolition waste • sewage sludge • biodegradable waste • packaging • batteries • waste shipments; • the distinction between waste and non-waste • clearer delineation between the lists of disposal and waste recovery activities contained in the Directive on Waste

In response to one of the requirements of the Sixth Action Programme, a draft Thematic Strategy on the Prevention and Recycling of Waste was published by the European Commission in the summer of 2003. The purpose of this document was mainly to set out the relevant issues with a view to inviting submissions from stakeholders about the most desirable future approaches for further waste prevention and recycling initiatives. Following a second phase involving a detailed impact assessment of the options, the intention is then to publish a finalised Waste Thematic Strategy in 2005. At the time of writing (October 2004), this work has yet to be completed.

1.3. EU Legislation

EU waste management legislation falls into three main categories:

- Framework provisions on such matters as legal definitions, waste plans, requirements for the statutory authorisation of waste facilities and the regulatory control over waste movements
- operational standards for particular types of waste management facilities, such as landfills and incinerators
- initiatives affecting priority waste streams, such as packaging waste and end-of-life vehicles

The last few years have seen a switch of emphasis away from the former two options to the final category. The earlier regulatory initiatives are now maturing, with enforcement and compliance becoming increasingly important. New initiatives tend either to fine-tune the existing provisions or focus more on entire waste lifecycles. Generally, the latter seek to reduce volumes of particular wastes, to diminish their hazardous properties or to jointly further these objectives.

Table 1.2 lists the legislation that is already required to be part of Irish national law or which will come into force over the implementation period for this Waste Management Plan.

1.3.1. Directive on Waste

The Council Directive on Waste (75/442) was made in 1975 and completely revised in 1991. It sets down a basic regulatory and organisational structure for the supervision of waste management by each member state. It does this by defining wastes and by requiring the establishment of regulatory bodies. It also defines which types of waste management activity require statutory authorisation, as well as the basic environmental objectives underlying such an authorisation system.

The Directive requires member states to establish an integrated network of disposal facilities, based on the principle of best available technology not exceeding excessive cost. The aim of this network is for the EU to become self-sufficient in disposal capacity and for individual member states to work toward such a goal. The Directive therefore requires that wastes should be disposed of in accordance to the “proximity principle” – that all wastes should be disposed of as close to their source of generation as possible.

It should be noted, however, that the proximity principle only applies to movements of waste to disposal facilities; it does not apply to waste transhipped to recycling or other types of recovery plant, with such transactions generally being subject to EU free-trade rules.

Table 1.2: EU Legislation Relevant to the Waste Management Plan*

- Directive 75/439 on the Disposal of Waste Oils
- Directive 75/442 on Waste
- Directive 91/157 on Batteries and Accumulators
- Directive 91/689 on Hazardous Waste
- Regulation 259/93 on the Supervision and Control of Shipments of Waste within, into and out of the European Community
- Directive 94/62 on Packaging and Packaging Waste
- Directive 96/59 on the Disposal of Polychlorinated Biphenyls and Polychlorinated Terphenyls (PCBs/PCTs)
- Directive 96/61 concerning Integrated Pollution Prevention and Control
- Directive 99/31 on the Landfill of Waste
- Regulation 1420/99 establishing Rules and Control Procedures to apply to Shipments to Certain Non-OECD Countries of Certain Types of Waste
- Regulation 1547/99 determining the Control Procedures under Council Regulation 259/93 to apply to shipments of Certain Waste to Certain Countries to which OECD Decision C(92)39 final does not apply
- Directive 2000/53 on End-of-Life Vehicles
- Directive 2000/76 on the Incineration of Waste
- Decision 2000/532 on a List of Wastes and Hazardous Wastes
- Regulation 2037/2000 on Substances that Deplete the Ozone Layer.
- Regulation 1774/2002 laying Down Health rules concerning Animal by-Products not intended for Human Consumption
- Regulation 2150/2002 on Waste Statistics
- Directive 2002/96 on Waste Electrical and Electronic Equipment
- Directive 2002/95 on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

Legislation in draft or coming into force over the Plan period

- Directive 2004/14 amending Directive 95/62 on Packaging and Packaging Waste
- proposed amendments to Regulation 259/93 on trans-frontier waste shipments
- the proposed repeal and replacement of Directive 91/157 on Batteries and Accumulators
- proposed provisions on bio-waste management included in a Directive on Soils

The Directive also sets down requirements relating to waste management plans. Plans are to be drawn up by each member state, and they must set out:

- the type, quantity and origin of wastes to be recovered and disposed of
- general technical requirements
- any special arrangements for particular types of waste
- suitable disposal sites or installations

1.3.2. Hazardous Waste Directive

The 1991 Hazardous Waste Directive puts forth a framework of unified controls on hazardous wastes which must apply in all member states. Besides mandating permits for hazardous waste sites and for their inspection by regulatory bodies, it requires hazardous waste movements to be formally documented.

* For brevity, amendments to this legislation are not included.

Each member state is directed to draw up a hazardous waste plan. This can be either done within the overall context of the waste managements plans required by the Directive on Waste or separate to them.

Hazardous waste is also defined. This is done in conjunction with an EU-wide Hazardous Waste List. A revised List came into force on 1 January 2002 when it was combined with a full listing of all waste types, which is known as the European Waste Catalogue (EWC) (Decision 2000/532 on a List of Wastes and Hazardous Wastes). Since that date both the EWC and the list of hazardous waste types have been amended a number of times.

1.3.3. Trans-frontier Waste Shipments

The purpose of Regulation 259/93 on Trans-frontier Waste Shipments is to allow member states to track and control waste movements into and out of their areas of jurisdiction. The Regulation is particularly stringent on international waste movements to disposal facilities. Shipments of this type are not generally permitted to leave the EU at all; moreover, member states are allowed to prevent the import of waste for disposal into their territories on specified grounds. Hence the UK, for example, only permits waste shipments from Ireland for disposal purposes where they comprise hazardous waste and are to pass to high temperature incineration.

The Regulation approaches waste movements to recovery facilities slightly differently. In line with the provisions of the Directive on Waste, such movements are generally subject to EU free-trade rules and hence are usually allowed to occur. This is reflected by a detailed list of wastes in the Regulation which feature on the so-called Green List, many of which are recyclables such as scrap metal, cardboard and paper, plastic and so on.

Such movements do not need the advance approval of member states: an immediate contrast to the provisions in the Regulation affecting other types of waste. However, formal regulatory approval is needed for more complex and environmentally hazardous wastes which are to pass internationally for recycling and which feature on the Regulation's Amber and Red Lists.

Besides Regulation 259/93, certain additional rules apply to waste shipments to countries which are not members of the Organisation for Economic Co-Operation and Development (OECD). The legislation contains restrictions on the movement of certain types of waste for recovery into specified non-OECD states. The purpose is to facilitate a non-OECD country's wish to prohibit such movements. The relevant legislation is contained in EU Regulations 1420/1999 and 1547/99.

1.3.4. IPPC Directive

Directive 96/61 concerning Integrated Pollution Prevention and Control Directive (IPPC) came into force in October 1999. It introduced a new system of permitting for major potential pollution sources, such as chemical plant, steel works and power stations, as well as certain large waste management facilities. The aim of the Directive is to ensure that pollution control regulation is fully integrated – in other words is holistic in its approach – and seeks to systematically reduce emissions to air, water or land. An EU-wide application of the concept of best available techniques for pollution reduction or elimination is being imposed.

The Directive contains detailed requirements which apply to new facilities which have been subject to permit applications after the date the legislation came into force. Existing installations have until October 2007 to fully comply with the Directive. Provisions are also in place which require that existing facilities which are proposed to be subject to a "substantial change" will be subject to the Directive's environmental standards which already apply to new activities.

Table 1.3 shows those waste management facilities which are subject to the IPPC Directive. It can be seen that the legislation mainly applies to large facilities accepting hazardous waste, as well as major landfills and incinerators. In the case of landfills, the Directive states that its technical requirements are satisfied when there is compliance with the Landfill Directive (discussed below).

Table 1.3: Waste Management Activities Subject to the IPPC Directive

- | |
|--|
| <ul style="list-style-type: none"> • hazardous waste disposal facilities > 10 tonnes per day capacity • hazardous waste recovery facilities > 10 tonnes per day capacity and involving the processing of waste solvents, acids and bases, 'components used for pollution abatement' and waste oil, along with processes which use waste to generate energy • non-hazardous waste landfills, other than for inert wastes, of an input rate > 10 tonnes per day or of > 25,000 tonnes total capacity • municipal waste incinerators of a capacity > 3 tonnes per hour • disposal processes involving biological and physico-chemical waste treatment > 50 t per day |
|--|

1.3.5. Landfill Directive

The Council Directive on the Landfill of Waste (1999/91) was required to be transposed into Irish law on 16 July 2001. Its overall objective is to tightly define and unify the nature of acceptable landfill usage, as well as promoting EU-wide standards for landfill site design, operation and post-closure. Overall, the purpose is to reduce and minimise the potential environmental impacts which may otherwise occur at any point in the life-cycle of a landfill.

The Directive sets down detailed technical requirements, which when satisfied ensure compliance with the IPPC Directive. These provisions vary in stringency, being a function of whether a landfill site takes hazardous waste, non-hazardous waste or inert wastes such as sub-soils or bricks. These requirements must be reflected in how applications for landfill permits are processed and also in operational and site closure practices.

For the reason that a large number of landfills already exist across the EU, the Directive contains transitional measures to ensure that the technical performance of these facilities is upgraded over a defined period. Otherwise the site must be closed by July 2009.

The Directive requires that, with the exception of inert waste, all waste being landfilled must be pre-treated. For landfill projects which are started after 16 July 2001, this requirement applied immediately. For existing landfills, this must happen before July 2009.

Besides technical standards, the Directive also contains binding obligations for an EU-wide reduction of the use of landfill as an option for the disposal of biodegradable municipal waste. It contains explicit landfill use reduction targets which must be applied nationally. These are shown in Table 1.4. These targets are to be viewed against baseline of the national landfill use in each member state for the year 1995.

Table 1.4: Landfill Directive Biodegradable Waste Diversion Targets

Target	To be Achieved by	Possible Derogation*
75 %	2006	2010
50 %	2009	2013
35 %	2016	2020

Subsidiary to the Directive is a separate Council Decision (2003/33), which sets down specified requirements which must be satisfied for a waste to be allowed to be disposed of in a landfill site. These provisions partly came into force on 16th July 2004, with the rest following in July 2005.

1.3.6. Directive on Incineration

In December 2002, Directive 2000/76 on the Incineration of Waste replaced three earlier directives on the incineration of hazardous waste and on emissions from new and existing municipal waste incinerators. Like the Landfill Directive, the Directive on Incineration is subordinate to the requirements of the IPPC Directive. The Directive not only covers incineration facilities specifically established to handle wastes, it also embraces boilers and other facilities – cement kilns being an example – where co-fuelling with waste occurs. It sets out mandatory operating conditions for the combustion process, emission limit values, stack-gas monitoring and cleaning measures, and so on, at all of these types of development.

1.3.7. Animal By-Products Management, Food and Catering Waste Composting and Bio-Gas Production

In 2003, a complicated EU Regulation on Animal by-Products (1774/2002) came into force. This replaced a series of earlier Directives which applied to the more traditional sources of animal waste such as abattoirs and meat factories. However, the new Regulation is wider in its scope; it covers all forms of catering waste – including waste from household kitchens – as well as food waste from such commercial activities such as supermarkets and shops when it contains any type of meat or fish. The purpose of this legislation was to greatly tighten-up on the management of all forms of animal-related waste in light of the foot-and-mouth outbreak in the UK and the BSE issue.

The Regulation generally allows for catering waste contained in the normal mixed waste stream from households to be landfilled in the usual way. Similarly most food waste from shops and food production premises can be landfilled at present; however, when commercially-sourced food waste contains cooked meat or fish, this practice can only continue until the end of 2005.

If catering waste or any other waste of animal origin is separately collected and is to pass to a composting or to a bio-gas facility, the full requirements of the legislation apply. These have two main aspects. The first is that a separate permit must be obtained for the operation of such facilities; in Ireland this is issued by the Department of Agriculture and Food. The second is that the plants must be operated under the stringent hygiene and process-related requirements contained in the Regulation.

* some highly landfill-reliant member states can seek this derogation. It is understood that Ireland is unlikely to do this at present

In practice, this legislation affects virtually every composting and biogas plant in the country which use waste as feedstock; the only exception will be those facilities that solely utilise green waste, such as vegetation from domestic gardens or shredded wood.

1.3.8. Packaging Directive

The aim of Directive 94/62 on Packaging and Packaging Waste is to harmonise measures on the management of packaging waste across the EU. This is to preclude countries using packaging waste recovery laws and standards as barriers to free trade, as well as to encourage the reduction of the generation of packaging-related residuals. The Directive covers all packaging, including that from industry, commercial activities and householders.

The Packaging Directive required member states to have “recovered” between 50 – 65 % by weight of packaging by 30th June 2001. Within this general target, between 25 – 45 % of packaging must be “recycled”, with individual minimum limits being set so that the recycling rate is to be no less than 15 % for each packaging material. The Directive makes a distinction between “recovery” and “recycling”: “recycling” excludes combustion and subsequent energy recovery.

Ireland – along with Greece and Portugal – has been granted a dispensation from the overall obligations relating to recovery and recycling of packaging waste. These countries must instead have attained at least 25 % packaging waste recovery rate by 2001 and can postpone the achievement of the other targets until 31st December 2005.

The Directive also sets down heavy metal limits for packaging, as well as general requirements on the content of packaging. National packaging and packaging waste databases need to be established.

Finally, Article 14 of the Directive requires all waste management plans to include a specific chapter on packaging and packaging waste measures. This must address:

- packaging waste prevention
- how reuse systems for packaging are being encouraged

The Packaging Directive is due to be significantly amended in 2005 and new and more onerous targets are to apply. These require that, by 31st December 2008, no less than 60 % of packaging waste is recovered or incinerated and that between 55% and 80% of packaging waste is recycled. Recycling targets are also set for a range of different types of packaging: glass 60 %; paper and board 60 %; metals 50 %, plastics 22.5 %; wood 15 %. Again, the distinction between “recovery” and “recycling” described above applies in the respect of these percentages.

The Directive allows Ireland discretion to elect to postpone the achievement of these targets. However, they must instead be met by 31st December 2011.

It should also be noted that, when amended, the Packaging Directive will contain an obligation for the setting of further targets, beyond those described above and for a period ending in 2014.

1.3.9. Waste Oils

The Directive on the Disposal of Waste Oils was finalised in 1975, being revised in 1986. Besides prohibiting the uncontrolled disposal of oil, it requires EU member states to generally prioritise the regeneration of waste oil, rather than its disposal or combustion. EU states are also required to carry out promotional campaigns to ensure that waste oils are safely collected. All undertakings involved in the collection or subsequent management of waste oil must be registered with the regulatory authorities of a member state. Holders of oils are prohibited from mixing them with toxic substances such as PCBs.

1.3.10. Batteries

Two Directives set down provisions for the marketing, heavy metal content, labelling and disposal of batteries: Directives 91/157 and 93/86. Batteries can no longer be sold after January 1993 if mercury levels are above that stipulated. All batteries have to be labelled to show their heavy metal content and to indicate whether they can be separately collected and/or recycled.

Member states are required to draw up programmes to reduce heavy metal content and to promote batteries containing lower levels of hazardous substances. They are also required to take appropriate steps to ensure that batteries are collected separately for recovery or disposal. These programmes should contain initiatives for making the public aware of the dangers of uncontrolled disposal, the meaning of the new labelling systems and ways of abstracting batteries which are permanently affixed to appliances which are now redundant. The first programme should be of a four year duration, starting 18 March 1993. After that, it should be renewed and updated.

1.3.11. Polychlorinated Biphenyls

The purpose of the PCB Directive (96/59) is to ensure that all transformers and other electrical items containing significant quantities of PCBs are decontaminated and that the resultant PCBs are correctly disposed of. Transformers and other electrical items containing significant quantities of PCBs must be decontaminated by December 2010 at the latest.

An inventory must be drawn up of all PCBs of over 5 dm³ in the interim period to 2010. All holders of such quantities of PCB are required to notify the appropriate authorities of their existence. Member states were required to have put in place plans for the decontamination and disposal of PCB-inventoried equipment by 1999. PCBs are also not to be re-used, with the Directive setting decontamination performance standards. Premises in which PCBs are stored must be appropriately labelled to make the emergency services aware of their presence in the event of an accident such as a fire.

1.3.12. Directive on Asbestos

This Directive (87/217) is primarily concerned with emissions from the manufacture, use and disposal of all types of asbestos product. It came into force in December 1998. The overall objective is to prevent and reduce asbestos emissions. It thereby sets down emission limits from asbestos dust collection equipment and on aqueous discharges from asbestos manufacture. It also requires emission monitoring be carried out when asbestos products are made or are disposed of.

The Directive states that activities connected with the use or installation of asbestos products should not cause significant pollution from asbestos dust or fibres. This requirement also extends to the demolition of buildings and asbestos stripping operations. In addition, the Directive requires that no fibres should be emitted when asbestos waste is transported. When asbestos is to be landfilled, it is to be treated or packaged in such a manner as to prevent the release of asbestos particles.

1.3.13. Regulation on Ozone-Depleting Substances

At least 170 countries, including Ireland, have ratified the Montreal Protocol - the international treaty to protect the stratospheric ozone layer. For the EU as a whole, the Protocol is enforced by Regulation 2037/2000 on Substances that Deplete the Ozone Layer.

Much of the Regulation became law in Ireland in October 2000. It affects users, producers, suppliers, maintenance and service engineers and those involved in the disposal of ozone-depleting substances. The latter include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, 1 1 1 trichloroethane and carbon tetrachloride. All of these materials are commonly present in refrigeration equipment, air conditioning plants, foams, solvents and in fire fighting equipment. The Regulation contains an extensive list of these substances.

Much of the Regulation is concerned with bans on the supply and use of these materials. What has more relevance to this Waste Management Plan are the requirements on the disposal and recycling of ozone-depleting substances, particularly in respect of the deadlines for the removal of these materials from scrap goods such as domestic fridges and so on.

Already in place under an earlier EU Regulation was a ban on the use of HCFCs in fridges, freezers, air conditioning systems and so on. However, as this equipment can have an average life of over ten years, an existing stock of domestic and industrial equipment of this nature will still contain significant quantities of HCFCs. These must be removed in accordance to Regulation 2037/2000.

Regulation 2037/2000 requires that all ozone-depleting substances used in air conditioning and refrigeration equipment must be recovered during the servicing and dismantling of this equipment. This requirement came into force on 1 January 2001. CFCs and any other specified solvents must be destroyed in an environmentally acceptable fashion such as by incineration. As an exception, HCFCs can be either re-used until 2015 or destroyed.

A second deadline applies to domestic refrigerators and freezers. From 1 January 2002, all ozone depleting substances must be removed from this equipment prior to disposal. This requires not only CFC-degassing, but also the removal of any CFC-based foam which may be present. Naturally, this will affect significant quantities of "white goods" which are delivered to local authority recycling facilities in County Kildare or are otherwise collected by scrap metal dealers.

1.3.14. End-of-Life Vehicles

The Directive on End-of-Life Vehicles (2000/53) was finalised on 21 October 2000. It required Ireland to transpose its requirements into national legislation by 21 April 2002.

The primary purpose of the Directive is to reduce the amount of waste produced by the dismantling of scrap motor vehicles, thereby enhancing recycling levels. The Directive contains certain requirements which must be met by the 2002 deadline, with other provisions coming into effect later.

The 2002-related requirements include the need for dismantlers of vehicles to be duly authorised by a regulatory body and that all authorised dismantling facilities must meet certain environmental performance standards and defined recycling levels. In addition, a national network to collect and process end-of-life vehicles must be established.

Further targets are to be achieved between 2003 to 2015. These include restrictions on the use of heavy metals into new vehicles, as well as for increasing recycling levels, which are set at 85% by 2006 and 95% by 2015. By 2007, householders wishing to scrap a vehicle must be able to deliver it to a dismantling facility free of charge. Such initiatives have to be at least partly funded by the vehicle manufacturers.

1.3.15. Waste Electrical and Electronic Goods

This initiative is composed of two Directives, Directive (2002/96) on Waste Electrical and Electronic Equipment (known generally as the "WEEE Directive") and Directive (2002/95) on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (often referred to as "RoHS"). Both Directives have been transcribed into national law by the following regulations:

- Waste Management (Electrical and Electronic Equipment) Regulations 2005 (SI 290 of 2005)
- Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005 (SI 340 of 2005)
- Waste Management (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) Regulations 2005 (SI 341 of 2005)

The purpose of these initiatives is to address the burgeoning mountain of spent electronic goods such as obsolete computers and used household equipment such as refrigerators and cookers, as well as to reduce the toxic nature of certain of their components. The proportion of electrical goods which can be recycled is to be enhanced, thereby causing an associated reduction in volumes of waste passing to disposal facilities. A prevention initiative is also included, which is intended to reduce the environmental significance of certain components, such as mercury.

The WEEE Directive requires manufactures and retailers of electrical equipment to set up systems to ensure that such products can be recovered at the end of its lifetime. The Directive contains specific targets in this respect. By 1st January 2006, recovery rates across most EU states are to be 80 % of the total weight of large household appliances, with component and material re-use being at least 75 % by weight. A range of other targets are to apply to other household and commercially-utilised electrical items. However, Ireland has been given an additional 24 months to comply with these targets if it needs to.

An essential component of the WEEE initiative is the establishment of a separate collection network for waste electronic goods. It is proposed that each member state will ensure that a nationwide network of bring centres is set up, where electronic and electrical goods can be delivered by householders free of charge. This has to be done by 13th August 2005. Take-back schemes must also be established, whereby a retailer that supplies electronic equipment is responsible for dealing with the unit it replaces. National agreements between retailers, distributors and manufactures can be used to set up a way of funding such initiatives. However, any provision for funding by such bodies must be in place by 13th August 2005.

The Directive sets down a general target of an average of four kg of waste electrical equipment to be collected per inhabitant each year by January 2006; however, this is also subject to a proviso which allows Ireland to put back this deadline by up to 24 months.

Like the system for end-of-life vehicles, all facilities which are involved in the dis-assembly of electronic goods are required to have permits from the state authorities. The Directive sets down environmental and operational standards for the treatment of this equipment. Such facilities must remove all fluids, as well as components such as batteries, printed circuit boards, cathode ray tubes and chlorinated fluorocarbons (CFCs). All WEEE storage and treatment facilities are also mandated to have roofing and impermeable surfacing. WEEE treatment facilities must have weighing arrangements, appropriate storage areas and equipment for dealing with contaminated water.

The RoHS Directive primarily involves requirements to further the reduction of the use of hazardous substances in WEEE. This is partly as a response to contamination problems which currently occur in the management of scrap materials. These problems primarily are caused by heavy metals and also from brominated fire retardants. Accordingly, the Directive requires manufacturers not to produce electronic goods which contain lead, mercury, cadmium, hexavalent chromium, as well as two types of brominated fire retardants, after 1st July 2006. The only exceptions are for those electronic goods listed in the annex to the Directive. Further targets are also to be set later for some of those products.

1.3.16. Renewable Energy Directive

On 27th September 2001, a Directive on the Promotion of Electricity from Renewable Energy Sources in the Internal Electricity Market was agreed by EU member states. The Directive is intended to ensure that there is a significant EU-wide increase in the use of energy from renewable energy sources. The Directive requires each EU member state to set targets for the promotion of renewable energy. A second, more long-term, objective is to harmonise schemes across the EU, which provide support to renewable energy projects, usually by way of premium pricing. The Directive is also intended to facilitate an increasingly open level of access to the national electricity generation network by producers of renewable energy.

The Renewable Energy Directive has relevance to the discussion in this Plan for the reason that certain waste management technologies fall within its definition of a renewable energy source. These will include not only landfill gas production, but also waste composting and biogas processes which result in the production of energy. Such projects may therefore benefit from being defined as renewable energy sources and subject to premium price support when the Directive is enacted.

1.3.17. EU Regulation on Waste Statistics

Regulation 2150/2002 on Waste Statistics came into force in January 2003. Its aim is to harmonise the manner by which EU member states collate statistics on waste management in order to ensure greater comparability between the data of individual countries. This is necessary to more effectively monitor national compliance with the national targets described elsewhere in this Chapter. It is also desirable so that national and international trends in waste arisings, recycling and disposal can be more accurately measured.

The Regulation sets out a system of waste classification, as well as prescribing conventions for the compiling of information on the generation of waste and the use of recovery and disposal facilities. Trans-frontier waste movements are also covered.

1.4. EU Legislation Expected to be Finalised in the Plan Period

The EU is currently drafting additional provisions which have yet to be completed. An indicative list is set out in the Sixth Environmental Action Programme and has been covered earlier in this chapter. It is important, however, that readers appreciate that none of these provisions have been finalised. This means that their content and implementation dates are likely to change and that future amendments will have a bearing on the long-term accuracy of what is discussed below. It is therefore not possible later on in this Plan to predict the effects of these initiatives upon County Kildare with any reliability.

1.4.1. Trans-frontier Waste Shipments

At the time of writing (October 2004), a proposal to amend EU Regulation 259/93 on Trans-frontier Waste Shipments is at an advanced stage of scrutiny by the institutions of the EU. Alterations are partly necessary to fine-tune the Regulation to better accord to recent changes in international treaties of trans-boundary waste movements. A further key issue is to clarify the criteria relating to the acceptability of waste moving out of the European Community, particularly in relation to environmentally appropriate standards of operation at the proposed destination of the shipment. Clarifications relating to the classification of recyclables as falling within the Regulation's so-called Green and Amber Lists also are being considered.

For the reason that it would appear that the final form of these changes is very much in a state of flux, they will not be described further here.

1.4.2. Batteries

Revised measures are being considered at EU-level in relation to the upgrading of the Directive on Batteries and Accumulators. This is partly because the existing EU Directive has a limited scope, being applicable only to batteries with a specified cadmium, lead or mercury content. As such batteries constitute about 7 % of the total EU battery market, it is considered that not enough is being done to further the general recycling of all types of battery.

Accordingly, this new initiative will apply to all batteries and accumulators marketed in the EU, with only a small number of exceptions. The proposed Directive will require member states to ensure that comprehensive recycling systems for batteries are established by manufacturers. Consumers will be able to drop-off batteries at collection points without a charge being made. Producers of motor vehicle and industrial batteries will be required to set up take-back schemes. Collection targets for consumer-sourced batteries are to be set.

Neither the final form of the requirements of the Directive nor a transposition date is clear at present.

1.4.3. Bio-waste: Composting

As an aid towards EU states meeting the Landfill Directive's targets for the diversion of biodegradable wastes from landfill sites, a draft directive was originally mooted on the Biological Treatment of Bio-waste. The idea was for EU-wide harmonisation of the requirements for the biological treatment of bio-waste – for example by setting performance standards for composting activities – in order to reduce the potential for negative impacts. Such impacts could stem either from the operation of the process itself or from the placement of the resultant residues onto agricultural or other land.

A Bio-waste Directive was also meant to provide clarity and further detail on the nature of the requirements stemming from EU Regulation 1774/2002 on Animal by-Products which apply to the composting and bio-gas sector.

In a significant change of tack, the proposed Bio-waste Directive was subsequently merged with EU work on a wider and more general Framework Directive on Soils. This will cover wider issues to do with soil protection and its long-term management. Accordingly, neither the scope of the requirements which will affect composting and bio-gas facilities are at all clear at the present time, nor is there an indication of a date when this important legislation will be finalised.

1.4.4. Mining and Mineral Waste

On 2 June 2003, the European Commission published a proposed Directive on the Management of Waste from the Extractive Industries. This proposal was partly in light of spectacular – and highly environmentally damaging – mine waste storage facility collapses in Spain and Romania. A further motivation was recent legal clarification of the EU definition of “waste” – which indicated that mineral spoil is subject to the Directive on Waste - and resultant concerns about the potential overlap of the Landfill Directive onto the mining and quarrying sector.

It is proposed that, in light of the requirements of the Directive on Waste, places where waste resulting from the extraction of mineral resources or the working of quarries is deposited are subject to a regulatory permit. This can only be granted when the regulatory body determines that what is proposed is environmentally acceptable. Each facility operator is proposed to be required to draw up a waste management plan for the facility, the focus of which is upon the prevention and re-use of waste at the site, as well as post-closure restoration and after-care measures. In light of the mine waste collapses in Spain and elsewhere, facilities are required to be categorised in accordance to their hazard. Category A sites are those associated with a possible potential hazard unless the defined precautions are taken; Category B locations are all other affected mining and mineral extraction facilities. Financial guarantees are proposed to be obtained from site operators to ensure that funds are available for environmentally appropriate site closure measures.

At the time of writing, this proposal is under negotiation at EU-level and hence the final form of the legislation remains unclear.

1.5. National Waste Management Policy

1.5.1. Introduction

National waste management policy is made by the Department of the Environment, Heritage and Local Government. Not surprisingly, a significant proportion of it relates to compliance with EU legislation. It is executed primarily by the local authorities and by the EPA; however, private bodies such as Repak Ltd and the Irish Farm Film Producers Group Ltd (IFFPG) also have a role. The respective duties of these implementation bodies will be set out in this Section, along with summary descriptions of the main policy statements and legislative provisions.

1.5.2. A Sustainable Development Strategy for Ireland

The national policy document “*Sustainable Development – A Strategy for Ireland*” was published in 1997. Its discussion of waste management issues endorses the EU waste management hierarchy, as well as the major policy objective of the attainment of more sustainable waste management practices.

The Strategy also sets down the following objectives:

- a stabilisation and reversal of the growth in waste production
- an intensification of reuse and recycling activity
- the implementation of improved planning and organisational arrangements set out in the Waste Management Act 1996
- the use of economic instruments to reduce waste, promote reuse/recycling, and increase management efficiency

Most of these proposals were subsequently taken up in later national policy statements.

1.5.3. The 1998 Ministerial Policy Statement on Waste

In September 1998, the Minister of the Environment and Local Government issued a policy statement on waste, entitled “Waste Management – Changing Our Ways”. This statement set out national objectives for the future management of waste. In summary these involve:

- meaningful strategic waste management planning, on a regionalised basis
- a dramatic reduction in reliance on landfill, in favour of integrated waste management approaches which utilise a range of waste treatment options to deliver ambitious recycling and recovery targets
- greater participation by the private sector in the provision of waste management services
- a more effective and equitable system of waste charging to stimulate waste minimisation and recovery
- greater utilisation of legislative initiatives to the scope of producer responsibility initiatives to particular waste streams
- the mobilisation of public support and participation

A key objective of the policy statement is to stabilise, and in the longer term reverse, the growth in waste generation. Specific targets to be achieved over a fifteen-year timescale are set out and these are discussed further in Section 7 of Volume 2 of this document.

The policy document lays down the challenge that good waste management practices should be the test of the quality of local authority environmental management and responsibility.

The document contains a detailed discussion of the function and purpose of waste management plans. It clearly views these documents as being more than a reflex response to EU or national legislative requirements. Such plans are instead described as providing a vital national framework within which various stakeholders can interact and achieve clearly understood objectives. They are also described as intended to address a number of key objectives, which are shown in Table 1.5.

1.5.4. National Climate Change Strategy

The most significant international protocol relating to the reduction of emissions of greenhouse gases was founded at Kyoto in 1997. Under an EU burden-sharing arrangement agreed after Kyoto, Ireland is permitted a limit of 13% over its 1990 emission levels by 2010. However, this target is proving highly challenging due to the current sustained levels of national economic growth.

In amongst other matters, the Kyoto Protocol requires a significant reduction in methane emissions from landfill activities. This is because methane has a virulent effect as a greenhouse gas.

While agriculture accounts for about three-quarters of Ireland's methane emissions - with enteric fermentation in ruminant animals being the principal source - waste disposal operations such as landfill in 1998 were estimated to contribute nearly 12 % of all methane emissions (1.5 million tonnes of CO₂ equivalent) and an overall 2.5 % of all global warming-related gases.

Table 1.5: Government Policy on Waste Management Plans*

"Traditionally local authorities have exercised their waste planning and management functions in isolation from each other and from other service providers, and essentially have seen themselves as the sole providers of public services and infrastructure in this area. Planning for the future must reflect a new approach to environmental management, involving constructive cooperation with local communities and neighbouring local authorities, and utilising the potential of the private sector to contribute in the delivery of public services.

"Planning must also be undertaken with a full appreciation of legislative and technological developments, which will have a critical bearing on the outcome. The implications of these new developments must be identified and quantified, so that they can be factored into local authority waste planning.

"Waste management plans should reflect an overall philosophy and must outline general objectives which will be pursued. It is also necessary that they establish more detailed and meaningful objectives, including where appropriate specific targets, towards which actions may be directed and against which performance may be measured. A general statement of intent, unsupported by a clear plan of action, will not serve a local authority well and would be a disservice to the developing waste industry and to the general public.

"From inception, a plan should involve a triple track approach, with work proceeding simultaneously and in parallel on each track to deliver an integrated waste management solution for the region concerned. The three essential components are:

- a comprehensive waste recovery programme, aimed in particular at substantially increasing recycling rates for municipal waste and C&D waste;
- planning for and the provision of requisite infrastructure, which should substantially come on stream within a period not exceeding 7 years, and
- access to adequate, environmentally sound, residual waste disposal capacity."

* Source: DELG (1998) "Waste Management – Changing Our Ways" pp 9-10, 20

While the relative contribution of methane emissions from landfill sites is small, these facilities represent one of the more readily controllable point-sources. Hence a very significant reduction in such emissions is envisaged in the National Climate Change Strategy which was published by the Department of the Environment in 2000. This document envisages a 60 % reduction in methane emissions by 2010, which becomes an 80 % reduction by 2015. This is to be achieved by landfill gas combustion processes such as flaring or energy generation, with an additional contribution resultant from the diminution of the proportion of biodegradable waste passing to landfill in accordance with EU and national targets. When combined with greatly increased levels of thermal treatment of waste, energy generation from the combustion of landfill gas is also envisaged by the Strategy to significantly off-set emissions from fossil fuel-related energy generation, thereby displacing 800,000 tonnes of CO₂ equivalent from such sources.

1.5.5. The 2002 National Policy Statement “Delivering Change”

A second waste-specific policy statement was published by the Department of the Environment in 2002, entitled “Preventing and Recycling Waste: Delivering Change”. This complemented and developed upon some of the themes of the earlier policy document “Changing Our Ways”, particularly in relation to waste prevention, re-use, recovery and recycling. It also emphasised the need for “meaningful and comprehensive” waste management planning, noting that there was a need to make the transition from plan-making to plan implementation, particularly in respect of matters to do with segregated waste collection, waste minimisation, provision of recycling infrastructure and public education. An additional emphasis was also placed on the need to significantly improve the enforcement of the existing waste management legislation.

The policy statement promoted the notion of a National Waste Prevention Programme to reduce waste, as well as a National Waste Management Board to support waste management policy-making. In respect of recycling levels, it was noted that Ireland lagged behind many of other EU states. Hence the need for enhanced waste collection and reprocessing systems was emphasised in light of an identified significant infrastructure deficit.

“Delivering Change” contains a range of policy initiatives to promote re-use and recycling. One of the most prominent is the introduction of user-based waste charges by all local authorities, thereby ensuring that waste generators are accountable for the full economic cost of the management of the waste they produce. This was supported by the introduction of the landfill levy to provide an incentive for the diversion of waste away from landfill sites, as well as by the introduction of a ban on the landfilling of particular types of waste that can be recycled. A theme of this policy statement is producer responsibility, whereby manufacturers, retailers and distributors of particular goods should be made responsible for the management of wastes that are consequent to the use of the items or the need to dispose of them.

A Market Development Group was proposed to progress the development of new ways of recycling and re-using waste. Performance indicators were to be introduced in order to more transparently assess a local authority's progress in providing the required new waste infrastructure. A National Strategy for Biodegradable Waste was to be drawn up in order to demonstrate how Ireland is to achieve the biodegradable waste diversion targets contained in the Landfill Directive.

1.5.6. The 2004 Policy Statement, “Waste Management: Taking Stock and Moving Forward”

On 5th April 2004, a further national waste management policy document – “Waste Management: Taking Stock and Moving Forward” – was launched. Taking Stock assesses progress on the implementation of a variety of aspects of the Waste Management Act 1996 over the last five years. It sets down new challenges in light of the findings of this assessment.

Substantial progress is noted to have been made in the provision of recycling infrastructure – a deficit that was a theme of the earlier national policy documents discussed above; however, there was an outstanding need to make early and substantial progress on the provision of biological waste treatment capacity in many parts of Ireland. Given new national recycling initiatives, concerns are raised about the size and distribution of civic waste sites, suggesting that existing sites need to be enlarged and/or that more sites be provided. Taking Stock also cautions against an over-provision of landfill sites, particularly that which is incompatible with landfill’s ‘residual’ role in integrated waste management. Finally - and following the earlier initiatives on packaging and farm plastics - new producer responsibility initiatives are proposed for newsprint/magazines, tyres, end-of-life vehicles, waste electronic goods and batteries.

Also published at the same time as Taking Stock was a review of all of the existing waste management plans - “National Overview of Waste Management Plans”. Overall, both of these documents emphasise that the concept of integrated waste management in a waste plan means exactly what is said: if a plan states that a full range of options needs to be pursued in parallel, then all need to be progressed. Hence there was criticism in relation to a lack of regional progress in developing waste-to-energy capacity in some parts of Ireland. As a result, all revised waste plans are required to set out a timetable for the provision of each of the elements of the infrastructure required to make up the integrated mix of options.

Taking Stock requires that revised waste plans must better address the role and needs of private sector waste management service providers. It also states that there is insufficient public awareness about waste plans. Hence €1m from the Environment Fund was to be allocated to communicate progress about the implementation of waste plans. Finally, this policy document requires that all revised waste plans must be subject to a mechanism to monitor implementation, with local authorities being obligated to prepare an annual report on waste plan progress within three months of the end of each year.

1.5.7. Draft National Biodegradable Waste Strategy

A requirement of the Landfill Directive is for each member state to publish a programme for the achievement of the biodegradable waste diversion targets which run until 2016. As a consequence, a Draft Strategy Report on the National Strategy on Biodegradable Waste was published by the Department of the Environment, Heritage and Local Government in April 2004. It focuses on biodegradable waste from municipal sources, such as from domestic dwellings and commerce and is discussed in Section 5 of this Volume.

1.5.8. Taskforce Report on Waste Electrical and Electronic Equipment

In April 2004, a Taskforce Report on Waste Electrical and Electronic Equipment was published by the Department of the Environment, Heritage and Local Government. It reviewed the likely issues affecting the implementation of the WEEE and RoHS Directives in Ireland.

In the context of this waste management plan, it should be noted that the Taskforce Report places significant emphasis on the role of civic waste facilities as critical points for WEEE collection. It is also recommended that reviews of already-approved waste management plans address the infrastructural issues stemming from this Directive. It was asserted that such a review must also take on board the private sector's role in the provision of WEEE collection and processing facilities.

The Taskforce Report states that, unless numbers and sizes of civic waste facilities were significantly expanded, infrastructural inadequacies are envisaged to present a significant barrier to the implementation of the Directive. Many existing sites are considered too small to accept or store the volumes of WEEE expected. Coverage was noted to be inadequate in some areas, particularly when related to local population figures. Besides the need for local authorities to address these issues, the Taskforce Report also indicates that hours of opening of civic waste facilities should be extended to accommodate users, and should include weekends.

WEEE processing infrastructure in Ireland is described by the Taskforce as "poor", and hence there is an over-reliance on the export of untreated WEEE from Ireland. Accordingly, there is a recognised need to improve the quality and provision of the treatment infrastructure.

Overall, the main requirements for local authorities which are set out in the WEEE Taskforce Report are as follows:

- providing an adequate number of civic waste sites, which are adapted to accommodate WEEE collection
- exploring alternative WEEE collection methods in line with the authority's statutory duty to arrange for the collection of domestic waste
- the full enforcement of the expected WEEE regulations
- providing a comprehensive system for the authorisation and oversight of private sector waste collection activities, as well as the regulation of facilities which undertaken the treatment, recycling or management of WEEE

1.5.9. Department of Agriculture Guidelines for Composting and Biogas Plants

On 28 October 2004, the Department of Agriculture and Food issued draft guidelines on how the elements of EU Regulation 1774/2002 on Animal By-Products which relate to composting and biogas plants will be implemented in Ireland. These guidelines also take into account the requirements of the current national legislation on animal health, which are mainly set down in the Prohibition and Use of Swill Order 2001 (SI 597 of 2001). They were issued for consultation purposes and hence may be subject to change. Indeed, the draft document itself acknowledges that the existing national legislation may need to be amended to allow for greater flexibility in relation to both the location of composting and biogas plants and also the end-use of compost or digestion residues. However, it is important that this waste management plan acknowledges the existence of the present form of the legislation and undertakes a preliminary evaluation of the most crucial requirements.

As the legislation stands, composting and biogas plants generally cannot be established on a farm or other premises where animals are kept. This requirement includes any composting plant taking catering waste, including those accepting food wastes sourced from household kitchens. There must be total separation between the facility and the farm, including different entrances and exits. All processing must be undertaken undercover, and in general the composting reactor must be of a totally enclosed design. Processing and operating standards are also prescribed. The main exception from these general rules relates to facilities using only manure as a feedstock for composting and biogas production. In addition, facilities solely processing non-animal waste - for example green waste – are excluded.

The end-use of compost derived from affected composting and biogas plants is also subject to the draft guidelines. In accordance with EU Regulation 177/2002, this material cannot be spread on pastureland at all. This is a very significant constraint and one that affects the choice of waste management options which are set out later in this waste management plan. The only exceptions to this general rule relate to compost produced and spread on the same farm or that which is composed solely of manure.

Both EU Regulation 1774/2002 and the draft guidelines allow compost derived from catering wastes – including food waste sourced from households – to be applied to horticultural land, such as forestry, parkland, land reclamation, old bog land, road verges and so on. This type of compost also can be used in private and domestic gardens. But in all cases, the proviso of the draft guidelines is that these areas are secure and that livestock cannot gain access to them.

1.5.10. Draft Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects

The construction/demolition industry is one of the largest waste producers in Ireland. The National Waste Database Report 2001 estimates that approximately 3.65 million tonnes of C&D waste arose in 2001. While significant progress has been made in the recycling of the C & D waste, with success in meeting the 2003 recycling target of 50 %, intensified efforts are required to achieve the target of 85% recycling set for 2013 in the policy document, *Changing Our Ways*.

The purpose of the draft guidelines is to promote an integrated approach to C&D waste management mainly through the optimum use of resources and materials. The draft guidelines provide guidance on the preparation of construction and demolition waste management plans for certain classes of project, which exceed specified threshold limits. The Guidelines emphasise that management of C&D waste should respect the waste management hierarchy of options with waste prevention and minimisation being the first priority succeeded by reuse and recycling; disposal should only be considered as a last resort and suggestions are made as to how the latter can be avoided.

While the Guidelines will operate generally on a voluntary basis, planning authorities may attach a condition to permissions for the types of development outlined above.

The Guidelines provide advice on the application of waste management Best Practice in the five phases of construction project: project conception/asset management, planning, design, pre-construction demolition, and construction.

1.6. National Legislation on Waste

1.6.1. Introduction: the Waste Management Acts 1996 to 2003

Ireland's waste management legislation was completely revised by the enactment of the Waste Management Act 1996. Since the Act came into force, it has been amended a number of times. Besides the Waste Management Act itself, a significant number of items of secondary legislation are now in force. These set down detailed provisions on various aspects of the Act and national waste management system. A full list of the legislation is shown in Table 1.6.

The Waste Management (Amendment) Act 2001 became law in 2001, causing some significant changes to the Waste Management Act 1996. Its primary purpose was to speed up the adoption of waste management plans. This was done by moving the ultimate responsibility for their approval from the elected members of a local authority to the county or city manager.

The Protection of the Environment Act 2003 later made further – and very significant – amendments to the Waste Management Act 1996. These came into force at different times in 2003/4. Following from the changes consequent to the Waste Management (Amendment) Act, the 2003 Act contained provisions which moved the responsibility for the variation, review and replacement of waste management plans from the elected members to the county or city manager.

The Act also contained a provision which allows a waste plan to take precedence where there is a direct conflict between it and a development plan drawn up under the Planning and Development Act 2000.

The 2003 Act also contained important reforms on waste charges. Since September 2003, these are set by the manager of a local authority instead of by its members. Allied to these provisions, the Act also confirms that waste does not need to be collected from householders who have not paid refuse charges.

Significant amendments also have been made by the 2003 Act to the waste licensing regime set out in the Waste Management Act 1996, and the boundary between waste licensing and IPPC licensing was clarified. Similarly, improvements to the package of measures contained in the 1996 Act in relation to enforcement were also made. The powers conferred on the EPA in relation to the oversight of local authority environmental activities were greatly strengthened.

However, not all of the remainder of the provisions set out in the 2003 Act became law with these new developments. For example, the regulations setting out the new provisions on end-of-life vehicles recovery have not yet been finalised at the time of writing (October 2004).

Table 1.6: Ireland's Waste Management Legislation

Ireland's Waste Management Legislation
<p>Primary:</p> <ul style="list-style-type: none"> • Waste Management Act 1996 • Waste Management (Amendment) Act 2001 • Protection of the Environment Act 2003 <p>Secondary:</p> <ul style="list-style-type: none"> • Waste Management Act 1996 (Commencement Order) 1996 (SI 192 of 1996) • Waste Management (Planning) Regulations 1997 (SI No 137 of 1997) • Waste Management (Register) Regulations 1997 (SI No 183 of 1997) • Waste Management (Movement of Hazardous Waste) Regulations 1998 (SI No 147 of 1998) • Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998 (SI No 148 of 1998) • Waste Management (Trans-frontier Shipment of Waste) Regulations 1998 (SI No 149 of 1998) • Waste Management (Hazardous Waste) Regulations 1998 (SI No 163 of 1998) • Waste Management (Miscellaneous Provisions) Regulations 1998 (SI No 164 of 1998) • Waste Management (Permit) Regulations 1998 (SI No 165 of 1998) • Waste Management (Hazardous Waste) (Amendment) Regulations 2000 (SI No 73 of 2000) • Water Quality (Dangerous Substances) Regulations 2001 (SI No 12 of 2001) • Waste Management (Use of Sewage Sludge in Agriculture) (Amendment) Regulations 2001 (SI 267 of 2001) • Waste Management (Farm Plastics) Regulations 2001 (SI No 341 of 2001)

- Waste Management Act 1996 (Prescribed Date) Order 2001 (SI 345 of 2001)
- Waste Management (Prescribed Date) Regulations 2001 (SI 390 of 2001)
- Waste Management (Collection Permit) Regulations 2001 (SI 402 of 2001)
- Waste Management (Collection Permit)(Amendment) Regulations 2001 (SI 540 of 2001)
- Waste Management (Environmental Levy)(Plastic Bag) Regulations 2001 (SI 605 of 2001)
- Waste Management (Landfill Levy) Regulations 2002 (SI 86 of 2002)
- Waste Management (Packaging) Regulations 2003 (SI No 61 of 2003)
- European Communities (Animal by-Products) Regulations 2003 (SI No 248 of 2003)
- European Communities (Incineration of Waste) Regulations 2003 (SI 275 of 2003)
- Protection of the Environment Act 2003 (Commencement) Order 2003 (SI 393 of 2003).
- Protection of the Environment Act 2003 (Commencement) (No 2) Order 2003 (SI 413 of 2003)
- Waste Management (Environmental Fund)(Prescribed Payments) Regulations 2003 (SI No 478 of 2003)
- Protection of the Environment Act 2003 (Commencement) (No 3) Order 2003 (SI 498 of 2003)
- Protection of the Environment Act 2003 (Commencement) Order 2004 (SI No 393 of 2004).
- Waste Management (Licensing) Regulations 2004 (SI No 395 of 2004)

1.6.2. Waste & Hazardous Waste

The Waste Management Act sets out legal definitions of both “waste” and “hazardous waste”. These are vital as the Act and its subsidiary regulations only affect materials which fall within these terms. Although it is important that these concepts are correctly understood, the issues involved can get complex, particularly in relation to spent materials which are potentially recoverable. Case law of the European Court of Justice also has a key influence to the interpretation of these definitions.

Waste is defined in the Act as something which is “discarded”. While the term “discarded” may usually mean “throwing something away”, in the Waste Management Act it needs a somewhat wider legal interpretation. This is because materials passing to recovery or recycling often fall within the legal definition of waste. The legislation views such substances as “discarded” when consigned to these activities.

This means that the definition of waste can include scrap, such as metal or an old car sent for dismantling. The definition also means that materials such as soils, used bricks or broken-up concrete may fall within the definition of waste if they are removed from a site and taken elsewhere for disposal or recovery. An understanding of the breadth of the definition of waste is particularly important in the context of this Waste Management Plan, for the reason that the Plan must make provision for the handling of all of the affected materials.

The term “hazardous waste” is also given a legal meaning in the Waste Management Act. This is done by separately identifying all types of hazardous waste in the European Waste Catalogue and Hazardous Waste List. In summary, for a substance to be defined under the Waste Management Act as a hazardous waste, it must:

- fall within the definition of waste just described
- be appropriately identified on the European Waste Catalogue and Hazardous Waste List
- exhibit certain hazardous properties (such as flammability or toxicity) which are set out in the Second Schedule to the Waste Management Act

1.6.3. Waste Planning

(i) *Local Authority Waste Management Plans*: the requirements for waste management plans are set out in Part II of the Waste Management Act. While the EPA has to make a national hazardous waste management plan, local authorities must make plans for non-hazardous wastes. The local authority plans must also set out measures relating to the implementation of all of the relevant provisions of the EPA's hazardous waste plan. Plans can be drawn up either by a local authority acting singly or as joint, regional, waste plan covering a number of neighbouring local authorities. Figure 1.1 shows a map of Ireland divided up by the current waste management planning areas. Kildare County Council has decided to act on its own in the making of its waste management plan.

The process by which a local authority waste management plan is drawn up is mainly provided for in Sections 22 and 23 of the Waste Management Act. However, those statutory bodies which are required to be consulted are identified in the Waste Management (Planning) Regulations 1997.

The waste management planning process can be summarised as follows. It is initiated by the publication of a notice in a local or national newspaper announcing the intention to make a waste management plan or a revision or variation to it. This opens a two-month period for interested parties to make submissions. A draft plan is then produced. Prior to it being adopted, the existence of the draft plan must be publicly advertised in a relevant newspaper. It must also be sent to the Minister of the Environment, to the EPA and to other prescribed consultees.

There then follows a period of two months from the date of the second advertisement for persons to inspect the plan, obtain a copy if they so wish and make written representations on it. Any such representation needs to be taken into account when the plan is being finalised – provided it has been received within the statutory time period. The plan can then be adopted by each local authority. The plan is renewable every five years. Once the waste management plan is adopted, the local authorities affected are under a duty to further the objectives of the waste management plan.

Waste Management Planning Areas

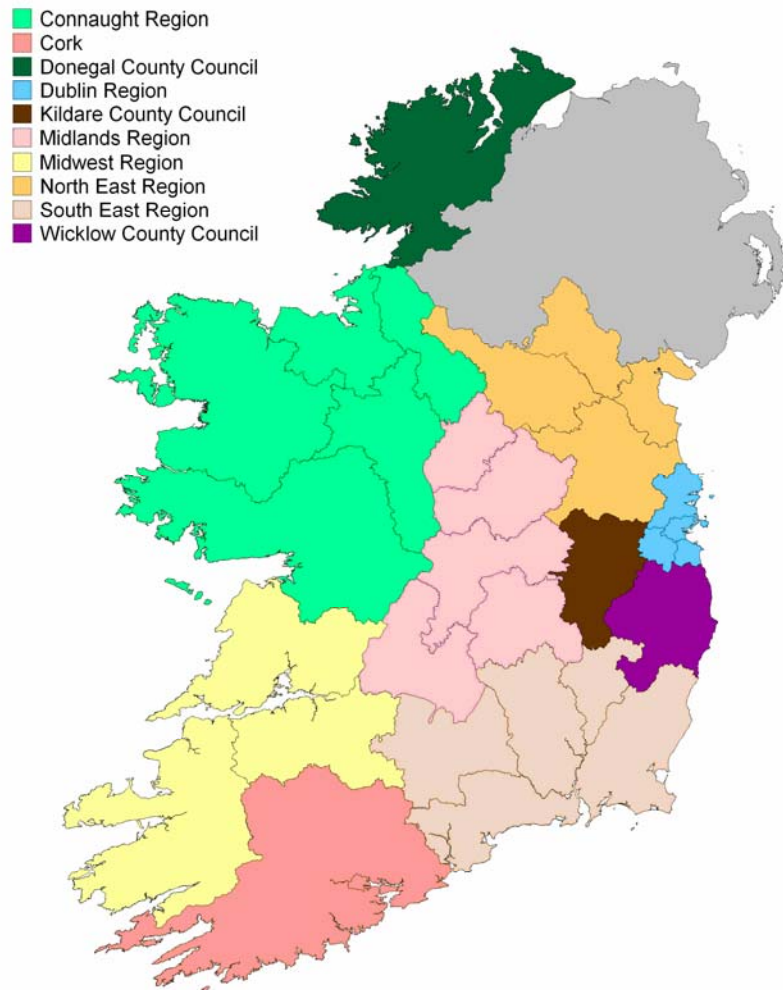


Figure 1.1: Waste Management Planning Areas in Ireland

The principal objectives of a waste management plan are shown in Table 1.7. It is of note that they relate only to non-hazardous waste, for the reason that similar objectives are already dealt with by the EPA in the making of the National Hazardous Waste Plan.

Table 1.7: Objectives of a Waste Management Plan

Objectives of a Waste Management Plan
<p>“A waste management plan shall, in respect of non-hazardous waste, contain such objectives as seem to the local authority or local authorities concerned to be reasonable and necessary –</p> <ul style="list-style-type: none"> a) to prevent or minimise the production or harmful nature of waste b) to encourage and support the recovery of waste c) to ensure that such waste as cannot be prevented or recovered is disposed of without causing environmental pollution d) to ensure in the context of waste disposal that regard is had to the need to give effect to the polluter pays principle <p>and shall specify such measures or arrangements as are to be taken or entered into by the local authority or local authorities, with a view to securing the objectives of the plan.”</p> <p>Waste Management Act, Section 22(6)</p>

What should be set out in a waste management plan is described in Sub-Sections 22(7) and (8) of the Waste Management Act. In summary, the plan should cover:

- policies, objectives and priorities for waste management for the area
- data and forecasts of wastes arising in the locality
- information on waste disposal and recovery facilities
- infrastructure which will be required in the planning period
- steps to be taken by a local authority to enforce the Waste Management Act
- an identification and risk assessment of closed waste facilities
- information on the implementation of the National Hazardous Waste Plan

Further requirements are given in the Schedule to the Waste Management (Planning) Regulations 1997. The latter, for example, requires a set structure to be followed and indicates the minimum content of each Part. It also mandates that a separate section on the implementation of the Packaging Directive must be included.

(ii) The National Hazardous Waste Plan: it has been noted that the EPA is required to publish a hazardous waste management plan for Ireland. The Waste Management Act requires local authorities to draw up proposals for the implementation of the National Hazardous Waste Management Plan in their areas.

The EPA published the National Hazardous Waste Plan in 2001. Some of its recommendations include:

- setting up a national hazardous waste prevention programme
- arranging for the separate collection of hazardous wastes from households
- recognising the need for Ireland to greatly reduce the level of exports of hazardous wastes
- establishing at least one hazardous waste incinerator and two hazardous waste landfills in Ireland

The National Hazardous Waste Plan is to be reviewed by the EPA on a five yearly basis. Its policies are considered further in Section 3 of this Volume.

1.6.4. Local Authority Duties on Waste Collection and Waste Facility Provision

Part IV of the Waste Management Act sets out the duties of local authorities relating to the collection and management of waste. Subject to certain prescribed exceptions, a local authority is under a statutory duty to collect household waste. It also has the discretionary power to arrange for the collection of other types of waste. These duties can be exercised by a local authority singly, by local authorities jointly or by a third party acting at the behest of a local authority.

Part V of the Act allows local authorities to operate waste recovery or disposal facilities. These can include civic waste facilities and other activities which involve waste processing or recovery. Again, such facilities can be provided by local authorities acting singly, jointly, or in conjunction with the private sector.

1.6.5. Movement of Waste & Hazardous Waste

Section 34 of the Waste Management Act requires that waste hauliers should be subject to Waste collection permit. This is done in conjunction with the Waste Management (Collection Permit) Regulations 2001.

These provisions required all specified organisations involved in the business of collecting waste to make an application for a collection permit by 30 November 2001. The only exceptions are for wastes moved by small waste producers, animal by-product carriers, etc; while persons involved in the collection of certain types of farm waste were granted a later application deadline of 30 June 2002. Besides waste collectors, waste brokers and dealers were required to identify themselves to the local authority in which their principal place of business is situated.

The issuing of waste collection permits is a local authority function. Ten local authorities issue permits in Ireland as a whole, with the boundaries being the same as those affecting waste planning. Hence Kildare County Council issues collection permits for waste hauliers who are involved in gathering waste in the County.

Waste collection permits can contain a variety of conditions on such matters as the use of licensed facilities, record keeping, insurance and skip lighting. They can be refused or revoked on the grounds set down in the legislation, the most important of which concerns whether a collection permit applicant or permit holder has been successfully prosecuted for breaching the Waste Management Act. In all cases, permits must be reviewed at least every two years by the local authority that issued them.

The Waste Management Act forbids a local authority granting a waste collection permit unless that body is satisfied that the issuing of the permit consistent with the objectives of the relevant waste management plan and the National Hazardous Waste Plan.

The Waste Management (Movement of Hazardous Waste) Regulations 1997 allow a local authority to track the transportation of hazardous waste. This process ensures that this waste ends up at a properly authorised waste management facility. Unless the waste is to be exported from Ireland, this tracking process involves the use of a consignment note, known as a "C1 form". Each party to a hazardous waste movement must complete this form so that the movement can be traced back to where it came from. Copies must be retained for a period of between three and five years.

Local authorities and the EPA may request to see completed C1 forms to verify that hazardous waste has been dealt with properly. A local authority is also required to send the EPA annual summary information on the movement of hazardous waste in its area.

If wastes are moved from Ireland to another international destination, they are subject to the Waste Management (Trans-frontier Shipment of Waste) Regulations 1998. Like the provisions controlling hazardous waste movements within Ireland, these set down a tracking system which is based on duplicated consignment notes. However, the system is rather more complicated. The legal requirements stem not only from the 1998 Regulations, as most of the detailed procedures are contained in EU Regulation 259/93 on the Supervision and Control of Shipments of Waste within, into and out of the European Community. The nature of this Regulation has been summarised earlier in this Chapter.

It is the local authority – rather than the EPA – that is the body with responsibility for this legislation in respect of the exportation of waste from Ireland. Imports into Ireland, as well as transit waste shipments, are controlled by the EPA.

1.6.6. Waste Licences and Waste Permits

The Waste Management Act requires most waste disposal and recovery facilities to have:

- a waste permit granted by a local authority
- a waste licence granted by the EPA
- a registration certificate issued by either the local authority or the EPA

A person who makes an unlawful use of a waste facility may be open to prosecution, as may the actual operator of the site.

Waste Licences: Part V of the Waste Management Act sets out the nature of waste licensing. Once granted, a waste licence defines the nature of environmentally acceptable waste management activities at a waste facility through the licence's conditions.

A waste licence cannot be changed unless the agreement of the EPA has been obtained. Usually, this process is formalised by a licensee applying to the EPA for a review of the licence. Licences cannot be surrendered or transferred without the approval of the EPA. These provisions are to ensure that any long-term environmental liabilities are always dealt with by the licensee. The procedures under which such applications are made are set out in Part V of the Waste Management Act and in the Waste Management (Licensing) Regulations 2004.

In summary – and subject to some exceptions - the following types of activity require waste licences:

- landfills
- incinerators
- disposal and recovery facilities for hazardous waste
- composting facilities holding more than 1000 tonnes of compost
- transfer stations and other non-hazardous waste disposal facilities, where the annual intake exceeds 5000 tonnes per annum
- other waste recovery and disposal facilities operated by local authorities

Since the enactment of the Waste Management (Amendment) Act 2001, most incinerators and other forms of thermal treatment plant now fall within the waste licensing regime of the Waste Management Act. The only exception relates to waste incinerators which are situated as industrial activities that are themselves subject to an Integrated Pollution Prevention and Control (IPPC) licence issued by the EPA. An example is an incinerator on premises which is involved in the production of pharmaceuticals.

There is an interconnection in the Waste Management Act between waste management plans and the issuing of a waste licence. The EPA is required to have regard to the content of a waste management plan in the process of considering a licence application. It must also ensure that licences are only issued to waste facilities where what is proposed is consistent with the objectives of the plan, and that no licence is issued to authorise a facility which might prejudice the implementation of the plan.

Waste Permits: certain types of waste management facility do not require waste licences, being instead subject to either waste permits or to registrations. The system of waste permits was started on 1 October 1998. Rather than the EPA, it is the local authority that deals with waste permits. They relate to the following type of activities:

- waste incinerators (other than for hazardous or hospital waste) with a capacity of less than one tonne per hour
- scrap metal recovery
- motor vehicle dismantling
- recovery of waste which involves mercury or its compounds (e.g. lamp crushers)
- recovery of non-hazardous waste (excluding any composting plant which deals with over 1000 m³ of compost at any one time)
- a non-hazardous waste disposal facility (but not a landfill) where the annual waste intake does not exceed 5,000 tonnes per annum

It should be noted that quite substantial recovery facilities can be subject to waste permits – provided that (a) they do not deal with hazardous waste or make compost from waste and (b) they are not operated by local authorities.

Registrations: instead of being required to have permits or waste licences, a small number of minor waste management facilities are subject to registrations. The registration authority is either the EPA or the local authority.

The EPA is required to register two types of local authority waste management activity:

- facilities where less than 5000 tonnes of waste is recovered
- sites where no more than 1000 tonnes of compost is held

In practice, most of these facilities will be local authority-run bottle banks and other similar infrastructure.

It should be noted that the system of permits under the Waste Management (Permit) Regulations 1998 is under review at the time of writing (October 2004). It is expected that the scope of those waste management activities which are subject to waste permits will be changed in the immediate future.

1.6.7. Packaging Waste

The Waste Management (Packaging) Regulations 2003 transpose the Packaging Directive 94/62 into Irish law. As noted earlier, the Directive requires that 25 % of Irish packaging waste was recovered by 1st July 2001. By the end of 2005, at least 50% must be recovered and over 25 % recycled, including a minimum recycling rate of 15 % for each type of packaging material. The Packaging Regulations apply to all organisations which supply packaging to the Irish market, be they retailers, packers/fillers, packaging distributors or manufacturers. Such organisations are classified as either “producers” or “major producers” of packaging.

A major producer is an organisation whose packaging production or the volume supplied exceeds 25 tonnes per year and has an annual turnover greater than € 1 million.

The Regulations set down stringent requirements on packaging waste management. These apply principally to major producers. An exemption from these obligations can be obtained when the organisation joins an "approved body". At present, the only approved body is Repak Ltd. Members pay fees to Repak. The monies accrued are re-distributed as grants and subsidies to ensure that packaging waste is recovered.

Repak Ltd is a not-for-profit limited company established under a voluntary agreement between the packaging industry and the Department of the Environment, Heritage and Local Government. The main purpose of Repak is to ensure that the packaging waste recovery targets set down in the EU Directive are achieved by Ireland.

While much of the focus of the Packaging Regulations relates to statutory requirements imposed on major producers, new provisions were introduced in 2003 which affects all organisations – including small shops – which produce any amounts of packaging waste. All such bodies are required to segregate their packaging waste and make it available for collection. Effectively, this element of the legislation is intended to ban the landfilling of packaging waste arising from commercial and industrial premises.

The Packaging Regulations are enforced by local authorities, with the Waste Management Act setting down penalties for non-compliance.

1.6.8. Farm Plastics

The Waste Management (Farm Plastics) Regulations are intended to greatly increase the recycling of farm plastics, thereby reducing rural litter and the open-burning of silage wrap on farms. They came into operation in August 1997, with replacement regulations being issued in 2001.

In a similar manner to the Packaging Regulations, the provisions on farm plastics principally rely on a voluntary scheme operated by the Irish Farm Films Producers Group Ltd (IFFPG). This company comprises manufacturers and importers of farm plastics. It provides a collection service to farmers, which is free of charge.

Manufacturers or importers are required by the regulations to join the IFFPG scheme. Those that do not can set up their own system but, like the Packaging Regulations, the requirements upon this option are much more onerous.

Enforcement of the Farm Plastics Regulations is carried out by the local authorities.

1.6.9. Waste Oil

The Waste Management (Hazardous Waste) Regulations 1998 outlaw the disposal of waste oil to watercourses or other drainage systems. It is also prohibited to mix oil with PCBs or other wastes. The Regulations impose particular requirements on persons who produce more than 500 litres of waste oil annually, who must keep records on the quantity, quality, origin and location of waste oil. When waste oil transfers occur, details of the date of transactions and the identity of the parties must be recorded.

1.6.10. Sewage Sludge

The Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998 control the spreading of sewage sludge on farmland. They require that only treated sludge is directly disposed of on agricultural land, with untreated sludge having to be injected. Septic tank sludge can be spread on grassland provided that it is not subsequently used for grazing purposes for six months. Suppliers of sludge need to have it regularly analysed to ensure that any heavy metal contamination is within acceptable limits. Local authorities have the duty to enforce these regulations.

1.6.11. Polychlorinated Biphenyls

The Waste Management (Hazardous Waste) Regulations 1998 set down obligations on all persons who hold PCBs, used PCBs, PCB-contaminated equipment and other similar types of PCB derivative. Industrial users of the older type of electrical transformers are likely to be the most affected.

The Regulations require all holders of this equipment to ensure that it is decontaminated or disposed of as soon as possible. There is also a requirement to provide labelling at premises where any of the larger PCB-containing equipment remains in use. Both the equipment itself and the doors to the particular premises must be clearly labelled to indicate that PCBs are inside.

Transformers containing specified levels of PCBs must be decontaminated. A deadline is set for this action: 31 December 2010. If such transformers are to be put back into service, the replacement fluid must not make the transformer difficult to dispose of. After decontamination, the transformer must be appropriately labelled.

The Waste Management (Hazardous Waste) Regulations also require that holders of equipment containing PCBs above stipulated levels must notify the EPA of the existence of the equipment. This must have been done by 1 September 1998. Details are given of the information required. This notification must be repeated annually thereafter.

The Regulations ban the importation, production and supply of PCBs in Ireland. PCBs cannot be re-used nor can transformers be topped up with PCBs. Similarly, it is an offence to hold specified levels of PCBs or PCB-containing equipment which has not been notified to the EPA.

While the EPA is required to draw up a national inventory of affected equipment and processing notifications from users, the remainder of the regulations is enforced by local authorities.

1.6.12. Batteries

As required by the Directive on Batteries, certain types of batteries with significant mercury content are banned from being supplied in Ireland. Subject to certain exclusions, restrictions also apply to electrical appliances which are operated by batteries containing mercury above defined levels. These appliances may not be marketed unless the battery can readily be removed. The appliance and any batteries supplied for it must be labelled in the manner set out in the Regulations. These requirements are enforced by local authorities.

1.6.13. Asbestos

The Waste Management (Hazardous Waste) Regulations 1998 require that the concept of Best Available Techniques Not Entailing Excessive Cost (BATNEEC) is to be utilised to prevent or limit the production of asbestos waste. The main relevance will be on companies involved in the manufacture of asbestos products, such as asbestos cement, paper and board, asbestos floor coverings and fillers.

The Hazardous Waste Regulations also require that no asbestos fibres or dust is emitted by any person involved in the transportation of asbestos wastes. While both local authorities and EPA have responsibility for any manufacturer of asbestos products – as these will often also need an IPPC licence from the EPA – the matter of the control of fibre releases is primarily a local authority function.

1.6.14. Waste Management Act Enforcement Powers

The enforcement of the Waste Management Act is split between the local authorities and the EPA. The EPA is responsible for the enforcement of waste licences. It may also be involved in enforcement of the Act's provisions on unauthorised waste management activities, but Section 59 of the Act makes clear that the affected local authority has primary responsibility.

Besides powers which can be used against unauthorised waste management activities, the local authorities are responsible for compliance with the Waste Management (Hazardous Waste) Regulations 1998, the Waste Management (Movement of Hazardous Waste) Regulations 1998, the Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998, the Waste Management (Permit) Regulations 1998, the Waste Management (Farm Plastics) Regulations 2001, the Waste Management (Collection Permit) Regulations 2001 and the Waste Management (Packaging) Regulations 2003. They are also responsible for the development control aspects of waste facilities, such as in the issuing and enforcement of planning permissions, which emanate from the Planning and Development Act 2000.

The Waste Management Act sets down penalties for breaching its requirements. Prosecution by local authorities or the EPA may lead to fines of up to €3000, as well as up to 12 months' imprisonment. More serious cases are taken by the Director of Public Prosecutions, and can involve fines of up to €15 million and prison sentences of up to 10 years. The legislation also contains provisions which single out company directors, managers and other senior staff in an organisation. These individuals can be prosecuted personally, as well as their company.

The Waste Management Act also allows the EPA to refuse a waste licence application if the applicant has been convicted of waste management offences. Similarly, an application for a waste collection permit can be refused - or the permit revoked - by a local authority on these grounds.

1.6.15. Plastic Bags

The plastic bag levy came into force on 4 March 2002, being set at 15 cent a bag. All retailers are required to charge it at the point of sale. Re-usable bags sold to customers for more than 70 cent each are exempt, and there are limited exemptions from the levy for plastic bags containing non-packaged fruit, vegetables and other similar goods, as well as bags used to contain fresh meat, fish and poultry.

Details of the amount of the levy charged must be included on all till receipts issued by retailers to customers. The levy is collected by the Revenue Commissioners, by way of returns which are generally to be sent in at three-month intervals. Non-payment of the levy is dealt with under the normal income tax legislation or under the Waste Management Act's criminal provisions. Unpaid levy can be recovered, and persons involved can be subject to fines or imprisonment.

Revenues from the plastic bag levy pass to the national Environmental Fund. The Fund is used to provide grants to assist waste management projects and local authority waste enforcement.

1.6.16. Landfill Levy

A landfill levy was introduced in June 2002, using powers contained Section 73 of the Waste Management Act. The rate is set at €15 per tonne, being collected from all operators of landfill sites: both local authority and private sector.

The levy applies to wastes delivered for disposal at landfill sites, including construction and demolition waste. However, there are limited exemptions from the levy for wastes used for landfill site engineering works, street cleaning wastes, dredging materials, etc. Moreover, it does not apply to land reclamation activities subject to permits under the Waste Management (Permit) Regulations.

The levy is collected by the local authorities and then paid into the Environmental Fund.

2. ANTICIPATED DEVELOPMENTS IN EU AND NATIONAL WASTE MANAGEMENT POLICY

2.1. Introduction

This Section is the first in a series which considers the anticipated developments which are expected to occur over the duration of this waste management plan. The Section considers the EU and national policy initiatives which are either in place or will come to fruition within the plan period and which will have a significant influence on the management of wastes over the next five years. These have been described in general terms in Section 1 of this Volume.

Section 1 of this Volume also covered a small number of proposed EU legislative initiatives which are – at the moment - more tenuous in their nature. This is because they have not been subject to the agreement of the governments of member states. While they are mentioned here for reasons of completeness, readers are reminded that the final form of these initiatives may well be somewhat different to what has been discussed. For obvious reasons, it is not possible to make provision in this Plan for these unfinished initiatives.

2.2. Existing Obligations and Prescribed Targets

As was set out in Section 1 of this volume, both EU and national waste management policy-making establishes general obligations and specific targets for the management of particular types of waste. Some of these are already extant. Others are expected to come to fruition over the plan period. Both of these types of initiative will be considered further here.

2.2.1. Landfill

Both the Landfill Directive and the 1998 national policy document “Waste Management – Changing Our Ways” sets down targets which apply to the use of landfill.

As discussed in Section 1 of this Volume, the Landfill Directive contains requirements which affect virtually all landfills, albeit that it sets out a transitional period for compliance by existing facilities. Under the Directive, an existing landfill includes those sites which were in operation prior to 16 July 2001, as well as any landfill which has been granted a permit by that date.

The Directive will have a significant influence on the design of new landfill sites over the Plan period, as it sets down detailed technical requirements on such matters as lining, leachate control and site closure. These requirements have already become standard practice in Ireland. More significantly, the Directive also requires that such facilities shall only accept waste which is pre-treated. Again, this requirement applies to new facilities from the July 2001 deadline onwards. Hence there is a need to ensure that there is adequate pre-treatment infrastructure in place to serve any new landfill proposal. The requirement for waste to be pre-treated will also relate to inputs to existing landfill sites after 16th July 2009.

Besides setting down a more stringent series of environmental standards for the operation of landfill sites, the Directive also contains targets for the national use of landfill. The attainment of these targets will have a significant affect on the type and content of the waste management strategy selected later in this Waste Management Plan.

The targets set down in the Directive are shown in Table 2.1. It can be seen that these will cause the reduction of the use of landfill for the disposal of biodegradable waste to 35% by 2016.

Table 2.1: Landfill Directive Biodegradable Waste Diversion Targets

Target	To be Achieved by
75 %	2006
50 %	2009
35 %	2016

Section 1 of this Volume has also alluded to the publication of similar targets in the national policy statement "Waste Management – Changing Our Ways". The most important are contained in Table 2.2 and include a diversion of up to 50% of household waste from landfill by 2013.

Table 2.2: Changing Our Ways – Landfill Targets: 1998 - 2013

A diversion of 50 % of overall household waste away from landfill
A minimum of 65 % reduction in biodegradable waste consigned to landfill
the rationalisation of municipal waste landfills in Ireland to 20 state-of-the-art facilities
reducing by 80 % uncontrolled methane emissions from landfills

2.2.2. Packaging Waste

Section 1 of this Volume has set out how the Packaging Directive and the Waste Management (Packaging) Regulations 2003 will cause the reduction of the production of packaging waste. The targets set out in the Directive are shown in Table 2.3. As was discussed in Section 1 of this Volume, more long-term targets are currently under review.

Table 2.3: Packaging Waste Targets for Ireland

<p>30 June 2001:</p> <ul style="list-style-type: none">• 25 % packaging waste recovery <p>31 December 2005:</p> <ul style="list-style-type: none">• 50 – 65 % packaging waste recovery• 25 % to 45 % packaging waste recycling*• no less than 15 % recycling for each type of packaging material <p>before 31 December 2011†:</p> <ul style="list-style-type: none">• > 60 % of packaging waste recovery or incineration• 55 – 80 % packaging waste recycling• recycling targets for each packaging material: glass 60 %; paper and board 60 %; metals 50 %, plastics 22.5 %; wood 15 %

Ireland's reaching the 2001 target was mainly achieved by the increased recycling of packaging waste derived from the commercial and industrial sectors. However, meeting the more onerous targets for 2005 and later will inevitably require significant recovery initiatives affecting the household waste stream. This will mean the provision of comprehensive kerbside collection arrangements for dry recyclables and associated public information initiatives to ensure their use.

2.2.3. Waste Oils

The legislation on waste oils has been in place for some time and no new initiatives are envisaged over the Plan period. However, the Waste Management (Planning) Regulations 1997 require that a waste management plan sets out information on how the processing of waste oils is to be prioritised.

2.2.4. Batteries

The legislation on batteries has been in place for some time. As discussed in Section 1 of this Volume, it only affects a small percentage of all batteries in the municipal waste stream. Besides the effects of the proposed revised Directive on Batteries and Accumulators – which is discussed later – the end-of-life vehicle and WEEE initiatives will inevitably cause a stimulation of the source segregation of batteries of all types by householders.

2.2.5. PCBs

The PCB Directive (96/59) and the Waste Management (Hazardous Waste) Regulations 1998 require transformers and other electrical items containing significant quantities of PCBs are decontaminated by December 2010 at the latest. The EPA has to set up an inventory of all PCBs of over 5 dm³, with holders of such quantities of PCB having a duty to notify the EPA of their existence. All PCBs from these sources will need to be processed by 2010 in the manner required by the legislation and as described in Section 1 of this Volume.

* The terms "recycling" and "recovery" are differentiated by "recycling" being a narrower concept which excludes energy recovery by such processes as incineration.

† This date assumes that Ireland will elect to take the derogation permitted under the amended Directive. If not, the relevant compliance date is 31st December 2008.

2.2.6. Asbestos

The relevant legislation has been in place for some time and no further developments are anticipated in the Plan period.

2.2.7. Ozone-Depleting Substances

The legislation on ozone-depleting substances has been in place for some time. However, it is expected that the implementation of the Directive on WEEE will result in significantly greater volumes of white goods requiring degassing prior to their recovery. Moreover, as a consequence of the recommendations of the Taskforce Report on WEEE, the required upgrading and expansion of the civic waste collection network inevitably places additional demands on the provision of such arrangements.

2.2.8. End-of-Life Vehicles

This Directive (2000/53) was required to be transposed into national legislation by 21 April 2002. The Directive sets the following requirements which must be met by April 2002:

1. all end-of-life vehicles are to be scrapped only at dismantlers which have been appropriately authorised by a regulatory body
2. all authorised dismantling facilities must meet certain environmental performance standards, such as having concreting, drainage, oil interceptors, as well as ensuring the correct storage of liquids and batteries
3. authorised facilities are to attain enhanced levels of recycling to ensure that materials such as catalysts in catalytic converters, windscreen glass, tyres, plastics, etc, are recovered
4. the establishment of a national network to collect and process end-of-life vehicles

In respect of items (1) and (2) above, these matters are partially addressed by existing legislation. The Waste Management (Permit) Regulations 1998 requires scrapyards and motor vehicle dismantlers to obtain permits from the relevant local authority. Such permits cannot be issued unless appropriate environmental controls are in place to avoid the facility causing environmental pollution. However, it should be noted that the End-of-Life Vehicles Directive makes much more explicit the nature of the technical changes which are necessary to ensure long term environmental protection from vehicle dismantling activities.

The Directive also sets further targets to be achieved between 2003 and 2015. These include:

1. restrictions on the incorporation of certain levels of heavy metals into new vehicles by July 2003
2. targets for increasing recycling levels, which are set at 85% by 2006 and 95% by 2015
3. householders wishing to scrap a vehicle must be able to deliver it to a dismantling facility without charge by January 2007
4. producers of motor vehicles should fund all or a significant part of the cost of arranging the free take-back scheme for householders by the time it comes on stream in January 2007

Some of these functions are within the remit of central government. For the reason that national regulations are not in place at the time of writing to transpose these requirements, the body responsible for the implementation of some of the other functions is not clear. However, it would seem likely that local authorities will have to deal with the additional environmental standards needed at end-of-life vehicle storage and dismantling facilities.

This may well require changes to permits already issued by Kildare County Council, and these will probably extend to setting down requirements for the enhanced levels of recycling of materials such as windscreen glass.

2.2.9. Waste Electrical and Electronic Goods

The Directive contains specific targets for each member state, with Ireland being granted an additional 24 months to comply with these targets if it needs to. Taking into account this derogation, the Directive requires that WEEE recovery rates will be 80 % of the total weight of large household appliances by 1st January 2008, with component and material re-use being set at least 75% by weight. Similarly, the Directive sets down a general target of an average of four kg of waste electrical equipment to be collected per inhabitant each year no later than by January 2008.

As noted in Section 1 of this Volume, an essential component of the WEEE initiative is the establishment of arrangements for a separate collection network for waste electronic goods, which is accessible to householders without charge. This has to be done by 13th August 2005.

Like sites processing end-of-life vehicles, all facilities which are involved in the dis-assembly of electronic goods are required to be granted either waste licences or waste permits. These are subject to the environmental and operational standards set down in the Directive. In some cases, licences or waste permits already issued may need to be amended to ensure compliance with the Directive.

Earlier in this waste management plan, it was noted that the Taskforce Report of WEEE emphasised the role of civic waste facilities as critical points for WEEE collection. Concerns were raised that, unless numbers and sizes of civic waste facilities were expanded, infrastructural deficits would hamper the implementation of the Directive. This point is also endorsed by the 2004 waste policy document, "Taking Stock and Moving Forward". Similarly, the Taskforce Report noted that WEEE processing infrastructure in Ireland is inadequate.

While the relevant national legislation has yet to be finalised, it would seem that considerable additional volumes of WEEE are likely to be received by Kildare County Council from householders in the local area. This may require expanded storage capacity at existing civic waste facilities, as well as the possible establishment of new sites.

2.2.10. Other Targets in "Changing Our Ways"

The 1998 Government policy statement also sets down a number of other targets which do not directly follow from EU waste management policy initiatives. With one exception, these need to be met within 15 years of the statement's date of publication. Table 2.4 shows the remaining targets, outside those discussed above, in relation to the diversion of waste from landfill sites.

Table 2.4: Non-Landfill Targets in Changing Our Ways

• recycling at least 50 % of construction and demolition waste by 2003
• recycling at least 85 % of construction and demolition waste by 2013
• development of 300,000 tonnes per year of capacity for composting and other biological treatment methods by 2013
• recycling at least 35 % of all municipal waste by 2013

It can be seen that the most pressing target which needs to be addressed concerns the recycling of construction and demolition waste.

2.2.11. Targets in the Biodegradable Waste Management Strategy

The Draft Strategy Report on the National Strategy on Biodegradable Waste is discussed in Section 5 of this Volume. It addresses how Ireland should meet the targets for landfill diversion which are contained in the Landfill Directive, which should reduce the amount of biodegradable waste passing to landfill to less than 400,000 tonnes by 2016. As set out in Section 5 of this Volume, this can only be achieved by a very significant national investment in non-landfill infrastructure.

2.3. EU Legislation Entering into Force in the Plan Period

The Waste Management (Planning) Regulations require a waste management plan to include information on pending EU legislation on waste management. The following is a review of the relevant provisions in the light of those requirements. However, it will be clear from Section 1 of this Volume that there is considerable uncertainty associated with virtually all of the proposed EU legislation that is likely to affect the waste sector in the next few years. This is because none is in a final form. In addition, transposition dates are not available. In this respect, this is a significantly different situation to that facing the previous edition of this waste management plan, where a significant amount of EU legislation had been finalised but was at an interim stage whereby the transposition date had not been passed.

2.3.1. Batteries

As discussed in Section 1 of this Volume, the purpose of the proposed revised Directive on Batteries and Accumulators is to cover all types of battery rather than just those containing specified heavy metals. When enacted, this legislation will require the provision of significant new infrastructure for the collection of all spent batteries. However, as the amended Directive has not been agreed at the time of writing (October 2004), details of the relevant timescales are not available at present.

2.3.2. Trans-frontier Waste Shipments

As has been noted in Section 1 of this Volume, the amendments proposed to Regulation 259/93 on Trans-frontier Waste Shipments are still under negotiation. Hence it is difficult to determine what, if any, effects they will have over the duration of this waste management plan. However, it would seem that they constitute fine-tuning rather than a fundamental review. Hence it is expected that the current restrictions on the export or import of waste to disposal facilities situated in the EU will remain essentially unchanged. Similarly, the general proviso that recyclable waste can be exported and subject to EU free-trade rules is likely to remain. What may well happen is that regulatory bodies may be required to more closely scrutinise the environmental performance of the proposed destinations of recyclable wastes, particularly those that are to be transported to non-EU countries. Moreover, it is expected that there may be greater clarity about the nature of those wastes that can be exported from the Community for such purposes and those where export should be more restricted for environmental and public health reasons.

2.3.3. Mineral and Mining Waste

It seems likely that this initiative will mainly reinforce existing environmental controls on the mining and quarrying sector, which mainly emanate from the Planning and Development Act 2000.

3. NATIONAL HAZARDOUS WASTE MANAGEMENT PLAN

3.1. Introduction

The Environmental Protection Agency (EPA) finalised the National Hazardous Waste Management Plan for Ireland in July 2001. Work on this plan started in 1997, with a proposed plan being published for public consultation purposes in 1999. The finalised Plan has to be reviewed every five years, with the first review being scheduled to be finalised by 2006.

The making of the Hazardous Waste Plan is a requirement of Section 26 of the Waste Management Act, which obligates the EPA to draw up the Plan. Section 28(8) of the Act requires local authorities to set out in their waste management plans the manner by which the policies contained in the Hazardous Waste Plan are to be implemented in their functional areas. This Chapter addresses this requirement, by outlining the major issues in the Plan which affect the management of wastes in Kildare and by showing how these will be responded to in the context of the EPA's recommendations.

At the outset, it is considered appropriate to set out the fact that responses to the National Hazardous Waste Plan by local authorities do have certain limitations and constraints. Readers need to be aware of this, particularly when they are tracing how various initiatives set out in the National Hazardous Waste Plan are reflected in this waste management plan for Kildare. The Hazardous Waste Plan contains a variety of recommendations which are directed towards different stakeholders such as central government, the local authorities, hazardous waste contractors and industry. A significant number of these proposals require the establishment of national bodies and their associated funding – an example is the proposed national hazardous waste prevention team. There are other similar proposals. Indeed, a number of them are expressed in the Hazardous Waste Plan as being recommendations from the EPA to central government.

While the next section will summarise the findings of the Plan as a whole, this issue does provide certain constraints to the final part of this Chapter, which identifies the initiatives in the Hazardous Waste Plan that warrant a response in the waste management plan for the Kildare as a whole.

3.1.1. Overall Objective of the Hazardous Waste Plan

The primary objective of the National Hazardous Waste Plan is shown in Table 3.1. This objective is fulfilled by a series of sub-objectives which are reproduced as Table 3.2.

Table 3.1: Primary Objective of the National Hazardous Waste Plan⁶⁶

<p>“The primary objective of the National Hazardous Waste Management Plan is to prevent the production of hazardous waste and to minimise the effect of hazardous waste on the environment. The secondary objective is to manage hazardous waste which cannot be prevented in such a manner as to ensure that environmental pollution is minimised and not transferred from one environmental medium to another; in other words, to bring about a qualitative reduction in the quantity of hazardous waste requiring management.”</p>

Table 3.2: Objectives of the National Hazardous Waste Plan

- “to describe and predict the type, quantity and origin of hazardous waste, its movement within, into and out of the country and facilities available for the collection, recovery and disposal of the waste
- to specify objectives and, where appropriate, targets in relation to the prevention and minimisation of the production of hazardous waste, the minimisation of the harmful nature of such waste and the recovery or disposal of such waste
- to provide for, as appropriate, the identification of sites at which waste disposal activities that to a significant extent involved hazardous waste have been carried on, the assessment of any risk of environmental pollution and the recommending of measures to prevent or limit such pollution and to identify remedial measures
- to have regard to the need to give effect to the polluter pays principle
- to have regard to the precautionary principle in relation to the potentially harmful effects of emissions and the risk of environmental pollution
- to make Recommendations, as respects the management of hazardous waste, regarding:
 - priorities, measures and programmes which could be pursued
 - infrastructure, facilities or other physical resources considered to be necessary
 - the functions of any relevant public authorities
- to specify policies which the Agency proposes to pursue”

3.2. Summary of the Policies in the Hazardous Waste Plan

3.2.1. Prevention of the Production of Hazardous Waste

The Hazardous Waste Plan places primary emphasis on the need for the prevention of the production of hazardous waste. This in order to reduce the production of hazardous waste to 1996 levels, thereby nullifying the increases resultant from Ireland's rapid economic growth between 1996 to 2001. Without a prevention programme, the Plan indicates that the amount of hazardous waste generated will continue to grow.

The Hazardous Waste Plan proposes out an extensive prevention programme which is to have a budget of nearly € 56 million over seven years. As an initial step, it is proposed to establish a “prevention team” to develop and co-ordinate hazardous waste prevention initiatives across Ireland. A key issue identified - which the Plan leaves unresolved - is how this team and the associated prevention programme are to be funded.

3.2.2. Elimination of “Unreported” Hazardous Waste

The Hazardous Waste Plan makes much of the claim that significant quantities of hazardous waste are unquantified and do not pass to legitimate waste management outlets for environmentally acceptable disposal or recovery. In total, the EPA considers that 74,000 tonnes of hazardous waste in Ireland is unreported, and which is also not managed correctly. This is approximately 25% of the total hazardous waste arising in Ireland.

Much of this unreported waste stems from small generators, such as households, agriculture and small firms. Often it is mixed with other general wastes. The Hazardous Waste Plan indicates that a significant quantity of this material probably ends up at landfill sites.

The Plan therefore proposes certain initiatives to eliminate the existence of unreported hazardous waste. These are discussed in the sections which follow.

3.2.3. Collection of “Unreported” Hazardous Waste

The Hazardous Waste Plan claims that much of the unreported hazardous waste is not managed correctly. While the majority of hazardous waste stems from large companies and is managed properly, much of the unreported hazardous waste arises from the premises of small companies and in limited quantities. Proprietors of these premises do not generally avail of the services of the existing hazardous waste collection network. Hence the EPA indicates that there is a need for an effective collection network to ensure that the unreported waste ends up where it should do. It also notes the need to provide information to generators on the obligations for the correct handling of this material to ensure that it is properly segregated and separately collected.

The National Hazardous Waste Plan singles out household hazardous waste as a category which should be segregated from the remaining household waste stream. The EPA indicates that each local authority should make provision for a household hazardous waste collection service. It is asserted that this should be extended so that it can be accessed by other small generators of hazardous waste.

3.2.4. Enforcement on “Unreported” Hazardous Waste

The Hazardous Waste Plan states that an important aspect of correctly managing the hitherto unreported hazardous waste is improved regulatory enforcement. Indeed, it describes this aspect as “the key” to attaining the target of eliminating unreported hazardous waste.

3.2.5. Export of Hazardous Waste

The Hazardous Waste Plan states that Ireland has become increasingly reliant on the export of hazardous waste to specialist handling facilities in continental Europe. In line with EU policy in relation to international waste movements for disposal, the Plan recommends that Ireland becomes self-sufficient in disposal sites for hazardous waste. Indeed, it describes the lack of hazardous waste disposal capacity as a “major bottleneck in terms of security of disposal outlets for hazardous waste”, meaning that Ireland’s industry may be negatively affected if any of these disposal outlets ceased to accept exported Irish hazardous waste. The Plan also supports national self-sufficiency extending to hazardous waste recovery infrastructure.

3.2.6. Disposal and Recovery Infrastructure for Hazardous Waste

The Hazardous Waste Plan notes that nationally there are 17 facilities which are authorised to store, recover or dispose of hazardous waste. It is also noted that this network has been subject to grant aid from national government in the past. The need for the continuation of this grant aid is stressed.

The EPA also assesses the adequacy of capacity to deal with certain key hazardous waste types. A summary of this assessment is set out in Table 3.3. What is immediately apparent is that a number of these key waste streams are not being correctly managed.

Table 3.3: National Hazardous Waste Management Plan – Key Waste Types

Waste Type	Capacity Availability in Ireland	Current Problems
waste oil	adequate	need for more oil regeneration
oil filters	adequate	significant improvement needed in collection rates
lead/acid batteries	adequate	significant improvement needed in collection rates
other batteries	none in Ireland	no capacity and negligible collection
fluorescent lamps	adequate	significant improvement needed in collection rates
photochemical waste	adequate	significant improvement needed in collection rates
solvents	inadequate	significant scope for new recovery capacity
healthcare risk waste	adequate for potentially infectious wastes. no capacity for blood products, anatomical waste, chemical and medical wastes	additional capacity needed and scope for improved segregation
sludges	inadequate	significant improvement in capacity for hazardous sludges needed
acid & alkali wastes	inadequate – due to lack of landfill capacity for sludges	inadequate for hazardous sludges
paints, ink and related packaging	inadequate	little segregation and no recovery or disposal infrastructure
agri-chemical waste (including its packaging)	inadequate	inappropriate disposal on farms, no segregation and no separate processing
contaminated drums and containers	adequate	increased regulation of unauthorised disposal needed
asbestos	inadequate for hazardous types	additional landfill capacity needed
PCBs and PCB-contaminated equipment	inadequate	no capacity - a national inventory is needed
contaminated soils	available*	“no major bottlenecks identified”
contaminated dredging spoil	inadequate	no such waste arising in Ireland
residues from thermal treatment	inadequate	needs to be developed in conjunction with thermal treatment proposals

However, in many cases Table 3.3 shows that there is already adequate infrastructure in place to collect and process these materials. This again emphasises the need for a tighter application of current environmental legislation as the key to dealing with the issues applicable to many of the waste categories shown in Table 3.3.

In other cases, Table 3.3 also shows that certain wastes do not currently have either an adequate collection or disposal infrastructure. This applies particularly to hazardous sludges, agrochemical wastes and asbestos. Hence there is a need for additional indigenous capacity. Indeed, the Hazardous Waste Plan states that there is now sufficient hazardous waste generated in Ireland to justify the establishment of a hazardous waste incinerator. In addition,

* while the EPA would seem to indicate that there is no problem with the management of contaminated soils, it has to be pointed out that much of the heavily contaminated material has to be exported to Europe for processing. This causes Ireland to be unhealthily dependent on the goodwill of other EU Member States in respect of access to contaminated soil processing capacity.

two hazardous waste landfills are proposed, being situated in the regions which generate the most hazardous waste – Cork and Dublin.

3.2.7. Closed Hazardous Waste Facilities

The Hazardous Waste Plan indicates that a number of closed hazardous waste facilities exist in Ireland. Some of these may be presenting significant environmental problems, while there may well be an absence of reliable information on the environmental impacts of others.

Out of an estimated 3000 contaminated land sites in Ireland, the EPA estimate that 487 may be contaminated by waste management activities. 84 of the latter sites are still operating.

The Hazardous Waste Plan makes clear that the onus is upon local authorities to identify sites where waste management activities have been carried out, assess the consequential risk of environmental pollution and to propose appropriate remediation. This is a reiteration of Section 22(7)(h) of the Waste Management Act. That sub-section requires that a local authority waste plan must embrace sites which have been previously used for waste disposal purposes – indeed, that sub-section directly relates to all types of waste site, not only that which has accepted hazardous waste.

As a response to this issue, the EPA sets out a methodology whereby local authorities can identify hazardous waste sites in their area and prioritise them in respect of possible environmental impacts. This methodology is summarised in Table 3.4. The Hazardous Waste Plan requires each local authority to set up a register which is specific to sites which have accepted hazardous waste.

Table 3.4: Hazardous Waste Management Plan – Methodology for Developing a Register for Hazardous Waste Disposal Sites

STAGE 1	Develop a list of the industrial, commercial or agricultural activities most likely to have resulted in the generation of hazardous waste which would subsequently have required disposal either on or off-site.
STAGE 2	Assess historical land-use with particular reference to the contaminative uses identified in Stage 1. This will require a desk study to identify the waste disposal activities likely to have been carried out and whether these took place on-site or off-site.
STAGE 3	Identify which of the locations identified in Stage 2 are most likely to have been used for the disposal of hazardous waste.
STAGE 4	Compile a 'section 26 register' of all suspected or known hazardous waste disposal sites.
STAGE 5	Carry out a preliminary risk assessment based on the desk study procedure in Stages 1 to 4. The assessment will allow suspect sites to be provisionally allocated to one of three priority categories (A, B or C) , thereby assigning each site included in the local authority register to a preliminary priority rating.
STAGE 6	Undertake an intermediate risk assessment, based on a literature review and a visual inspection of the site. The results of this procedure will allow suspect sites to be re-allocated, as appropriate, to a more relevant priority category. The resultant priority rating will allow identification of those sites which must be subjected to Stage 7 investigations, as well as ranking them in order of priority.
STAGE 7	Carry out a detailed risk assessment, based on actual site investigation work. Stage 7 investigations will verify the presence or absence of contaminants and will provide the information to be used in identifying an appropriate remediation strategy.

Having developed the register, a risk assessment process must be applied to prioritise the urgency of clean-up. This will result in three categories of site:

Category A (high priority)

- 1) sites known to have been used for hazardous waste disposal
- 2) sites suspected to have been used for hazardous waste disposal and for which there is strong evidence that environmental pollution is occurring

Category B (medium priority)

- 1) sites suspected to have been used for historical hazardous waste disposal and for which there is some evidence that environmental pollution is occurring
- 2) sites about which very little information is available but which are considered to be suspect. It is consistent with the precautionary principle that these sites be included in this category as there is no evidence to suggest that they do not represent an environmental risk

Category C (low priority)

- 1) sites which are known to have been used for historical waste disposal but which are unlikely to contain significant deposits of hazardous waste
- 2) sites which are suspected to have been used for historical waste disposal but for which there was no significant incidence of historical contaminative activities in the catchment area

3.2.8. Implementation of the Hazardous Waste Plan

The EPA recommends that a national “implementation committee” is set up to ensure that there is progress on implementing the recommendations of the Hazardous Waste Plan. This committee is to be composed of statutory bodies, commercial sector providers of waste management services and hazardous waste producers. The committee is also envisaged as guiding the waste prevention team mentioned earlier.

3.2.9. Resources to Implement the Hazardous Waste Plan

The EPA states that three main types of resources are need to ensure that the Hazardous Waste Plan is fully implemented. These are for:

- hazardous waste prevention and the prevention programme set out in the Plan
- providing new or upgraded hazardous waste management infrastructure
- local authorities and the EPA in ensuring the enforcement of the hazardous waste legislation and in providing hazardous waste management services for householders and small businesses

3.2.10. Hazardous Waste Plan: Priorities 2001-2006

The following key immediate priorities are set out in the Hazardous Waste Plan:

1. the establishment of the implementation committee by the Department of the Environment and Local Government
2. the establishment of the hazardous waste prevention team
3. the elimination of unreported hazardous waste arisings
4. the identification and prioritisation of closed hazardous waste sites
5. the establishment of improved collection systems for hazardous waste generated by householders, by small businesses and by agricultural activities
6. the allocation of financial and technical assistance to address capacity deficits in national hazardous waste management infrastructure
7. the development of both hazardous waste landfill and incineration capacity
8. new public awareness initiatives on hazardous waste issues
9. the further development of a number of current initiatives, particular those which relate to “clean technology”

3.2.11. Hazardous Waste Plan: Targets

The Hazardous Waste Plan proposes two key targets:

- a “standstill scenario” for hazardous waste passing to disposal, which means that the amount of hazardous waste arising in Ireland is to be reduced to its 1996 level
- the elimination of the existence of the “unreported” hazardous waste (discussed above)

3.2.12. The Role of Local Authorities

The National Hazardous Waste Plan emphasises the key role that local authorities are to play in the implementation of the Plan, as set out in Table 3.5. What is of particular note is that the EPA views local authorities as having a role in the prevention of the production of hazardous waste.

Table 3.5: Hazardous Waste Plan – the Local Authority Role

“Local authorities have a significant role in implementing the Plan, generally within the scope of local or regional Waste Management Plans. Except where a particular facility is licensed by the Agency, local authorities are responsible for hazardous waste regulation within their functional areas. It is envisaged that local authorities will take an increasing role in the promotion of hazardous waste prevention.”

As noted earlier, one of the two key targets sets by the EPA is the elimination of “unreported” hazardous waste. The EPA views this as being attainable by the correct and comprehensive enforcement of the national environmental legislation. Given that the primary role in this matter is placed up local authorities, these bodies are seen to exert a key role in this function.

3.3. Hazardous Waste Arising in the Region

The Waste Management (Movement of Hazardous Waste) Regulations, 1998, set the controls required for movement of hazardous waste within the State. The Regulations require that a consignment note - the C.1 form - must always accompany the movements of hazardous waste within the State.

In 2003, 2,781 consignment notes were issued within County Kildare. Approximately 3,170 tonnes was actually generated within the County with a further 2,900 tonnes of hazardous waste been transported into Kildare. Both Returnbatt and Irish Lamp Recycling Limited have national contracts for the collection of batteries and fluorescent lights. Both of these organisations have facilities within Kildare for the treatment of these hazardous waste streams.

The 2001 National Waste Database identified County Kildare as one of the principal exporter of hazardous waste (6,863 tonnes). This can be attributed to the presence of electronic industries and hazardous waste facilities in County Kildare. A total of 5,833 tonnes of notified waste was exported from Co. Kildare in 2003.

3.4. National Hazardous Waste Management Plan – Annual Report 2004

The National Hazardous Waste Management Plan Annual Report was published by the EPA in April 2004. This report assesses the implementation of the plan to date. Table 3.6 outlines the implementation to date on a national scale.

3.5. Responses to the Policies in the Hazardous Waste Plan

3.5.1. Key Targets and Priorities

The main targets and priorities identified in the Hazardous Waste Plan are summarised in Table 3.7, which also sets out the main stakeholder responsibilities. What is immediately obvious is that Hazardous Waste Plan envisages the multi-faceted involvement from all stakeholders. Besides proposing obligations upon local authorities, it also requires that affected organisations work together on proposed bodies such as the Plan's implementation committee.

As noted earlier, some of the proposals in the Hazardous Waste Plan are dependent upon the necessary structures being established at national level and for central government funding to be allocated and distributed. By contrast, other targets and priorities can be addressed by more localised initiatives. These are also identifiable from Table 3.7. The sections which follow will analyse how Kildare County Council intend to make their contribution to the implementation of the Hazardous Waste Plan.

Table 3.6: Status of the Implementation of the Hazardous National Waste Management Plan

Priority	Progress
1. The establishment of an Implementation Committee.	Established July 2003. Replaced by National Waste Prevention Committee in April 2004.
2. The establishment of a Prevention Team to implement the Prevention Programme.	A National Waste Prevention Programme was launched in April 2004 and will be implemented by a Core Prevention Team within the Environmental Protection Agency.
3. The identification and elimination of unreported hazardous waste.	Reduced by 51% between 1996 and 2001 to 48,402 tonnes.
4. The identification and assessment of hazardous waste disposal sites.	Progress is slow and unsystematic. Only one local authority has systematically carried out this recommendation.
5. Establishment of an improved collection infrastructure for hazardous household, agricultural and SME wastes.	Civic waste facilities are increasing and all now accept small-scale hazardous waste to a greater or lesser extent. A mobile collection service was used by 18 local authorities in 2003.
6. The allocation of financial and technical assistance for the development of hazardous waste recovery and disposal facilities.	No grant aid has been provided to the private sector for the recovery and disposal of hazardous waste since the 1997 grant-aid applications round.
7. The development of hazardous waste landfill and thermal treatment capacity for hazardous wastes requiring disposal to achieve self-sufficiency.	No hazardous waste landfill has been proposed. One proposal has been made for a hazardous waste incinerator.
8. Improved public awareness of the impacts of hazardous wastes.	It is difficult to quantify progress on this recommendation. The quantity of unreported hazardous waste has decreased, indicating increased compliance with regulations. The Race Against Waste campaign has raised public awareness of the waste issue in general.
9. Build on on-going prevention, research and demonstration initiatives.	Examples of ongoing initiatives include: <ul style="list-style-type: none"> • Cleaner Greener Production Programme (EPA) • Environmentally Superior Products Programme (Enterprise Ireland) • Environmental Management Systems Grants (Enterprise Ireland)
Long-term Priorities:	
1. The achievement of self-sufficiency in hazardous waste management.	Recovery: adequate domestic capacity exists for many hazardous waste streams. Technical feasibility is not generally a barrier. Private sector economic considerations, coupled, potentially, with grant support, will drive the development of new or expanded facilities. Disposal: inadequate domestic capacity exists for the disposal of hazardous waste by thermal treatment and landfill. Only one proposal (for a hazardous waste incinerator) has been made.
2. No increase in hazardous waste disposed of over 1996 quantities.	Hazardous waste disposal increased to 125,629 tonnes in 2001. The recommended target is 86,754 tonnes.
3. The qualitative reduction (i.e. reduction in the degree of hazard) of hazardous waste.	This is difficult to measure and has as much to do with product design and manufacture as with waste. No indicators for progress are readily available.

Table 3.7: Implementing the Hazardous Waste Plan – Stakeholders' Responsibilities

	Central Government	Local Authorities	EPA	Waste Contractors	Industry
Hazardous Waste Plan: Priorities					
establishment of implementation committee	XXX	X	X	X	X
establishment of hazardous waste prevention team	XXX	X	X	X	X
elimination of unreported hazardous waste arisings		XXX		X	X
identification and prioritisation of closed hazardous waste sites		XXX	X	X	X
establishment of improved collection systems for household hazardous waste and for small businesses and agriculture		XXX		XXX	
financial and technical assistance to address infrastructure capacity deficits	XXX			X	
new hazardous waste landfill and incineration capacity				XXX	
new public awareness initiatives on hazardous waste issues	X	XXX	X		X
the further development of current initiatives, including "clean technology"	XXX		X		
Hazardous Waste Plan: Targets					
a "standstill scenario" for hazardous waste passing to disposal, reducing the amount of hazardous waste to its 1996 level	XXX	X	X	X	X
the elimination of the existence of the "unreported" hazardous waste		XXX			X

Notes: XXX = Key Lead Role
X = Participant

3.5.2. Hazardous Waste Prevention

Kildare County Council acknowledges its role in the prevention programme proposed by the EPA in the National Hazardous Waste Plan. However, the Council also notes that some of the initiatives set out in the Plan require funding and organisational arrangements to be put in place by central government. Nevertheless, Kildare County Council will seek to further the initiatives proposed by the EPA unilaterally, co-operatively between the constituent county councils or in conjunction with central government and other stakeholders. Approaches on participation in national initiatives such as the hazardous waste prevention team would also be welcomed.

3.5.3. Elimination of "Unreported" Hazardous Waste

The possibility that a significant amount of hazardous waste generated by households, agriculture and small businesses is not correctly handled in Kildare is acknowledged.

In light of the recognised need to produce more reliable information on unreported hazardous waste, Kildare County Council will:

- use its specialist knowledge of local industry and commerce to ensure that all generators of hazardous waste are identified
- closely monitor waste movements which are reported to them by way of C1 forms and trans-frontier waste notifications, with a view to ensuring that hazardous wastes are being correctly and comprehensively notified in the manner required by the relevant legislation
- provide information on the correct management of hazardous wastes to households, the agricultural sector and small businesses
- ensure that the relevant legislation is enforced comprehensively and that non-compliances are detected, followed up and – where appropriate – placed before the national courts
- ensure that collection infrastructure is in place for the gathering of hazardous wastes from households (see below); assist in the development of collection systems for the agricultural sector and small scale hazardous waste generators in commerce

3.5.4. Hazardous Waste Collection Infrastructure

It is noted that the Hazardous Waste Plan indicates that Ireland has an adequate basic collection infrastructure for hazardous waste. Hence it is appropriate that new proposals build on these current initiatives. Indeed, since the Hazardous Waste Plan was published, Kildare County Council has introduced a mobile hazardous collection unit for household waste such as paint, medicines, pesticides, fluorescent tubes and batteries.

It is also noted that the Hazardous Waste Plan states that the hazardous household waste collection services should be extended to serve other small hazardous waste generators. While the Kildare County Council have no disagreement with this sentiment, they consider that commercial sponsorship or national government funding of any such initiative is required.

In summary, Kildare County Council will further the need to set up an adequate hazardous waste collection infrastructure by:

- ensuring that household hazardous waste collection is extended to be available to all residents within the County
- supporting such initiatives by appropriate publicity measures on waste prevention, collection and correct management
- supporting the possibility of the extension of the collection service to small hazardous waste generators in commerce and also in agriculture
- comprehensively enforcing the relevant legislation to ensure that hazardous waste is appropriately managed

3.5.5. Disposal and Recovery Infrastructure

The Hazardous Waste Plan indicates that a landfill should be established for hazardous waste in the Dublin and Cork areas, and that a hazardous waste incinerator is proposed for Ringaskiddy in County Cork. Kildare County Council support these initiatives and urge that the significant gaps in the national hazardous waste management infrastructure are addressed by the Cork and Dublin local authorities.

In addition, Kildare County Council will also further the provision of intermediate collection and handling infrastructure for hazardous waste collected in the county. Subject to land use compatibility issues and public safety matters, the council will have regard to the recommendation in the Hazardous Waste Plan that local authorities establish hazardous waste drop-off points at bring banks and civic waste facilities. Currently household waste is accepted at Silliot Hill civic amenity and receptacles will be in place at both Athy and Kilcock civic amenities.

3.5.6. Closed Hazardous Waste Facilities

Kildare County Council will embark on a process which locates all significant historic hazardous waste sites, as part of the statutory function to compile a register of closed waste disposal sites. The methodology for the selection and prioritisation of this register will follow that set down in the Hazardous Waste Plan.

Where sites have been identified as having priority environmental impacts, the council will look to their statutory powers to ensure that such impacts are mitigated by the persons responsible.

4. PACKAGING WASTE

4.1. Packaging Waste Recovery - the Repak Scheme

Repak Ltd was established in 1997 as a partnership between industry, government and the local authorities. It is a non-profit making company, and is the sole “approved body” under the Waste Management (Packaging) Regulations 1997.

The objectives of the organisation are to:

- raise and disperse funds to ensure that packaging waste is recovered
- agree and implement strategies with its partners to ensure compliance with the EU packaging waste recovery obligations
- collate statistics on packaging waste recovery
- monitor and audit national performance on packaging waste recovery
- ensure that packaging waste recovery is addressed by all industrial sectors

Repak organises a number of educational initiatives such as Repak Green Christmas and Repak National Recycling Week. It provides funding also for the Tidy Towns Competition and the Repak Cash for Cans initiative which runs in all national schools in Ireland.

A very significant Repak function is the redistribution of funds for packaging waste recovery under the Repak Payment Subsidy (RPS) Scheme. The RPS scheme was started at the beginning of 2001, with a national budget of € 7.1 million for that year. The subsidy passes to all legitimate waste collectors, termed “approved contractors”, of whom there are four in Kildare. The subsidy is an agreed payment for each tonne of packaging waste recovered. The value of the subsidy varies in accordance with market prices and is outlined below.

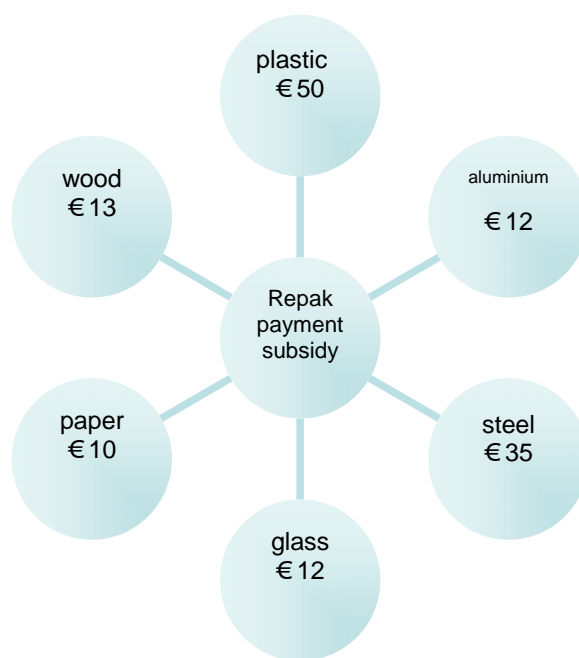


Figure 4.1: Repak Payment Subsidy Scheme

Figure 4.2 shows how much of Repak's budget was paid to the "approved contractors" under the RPS scheme. In 2002, 68% of their funds were dedicated to this scheme.

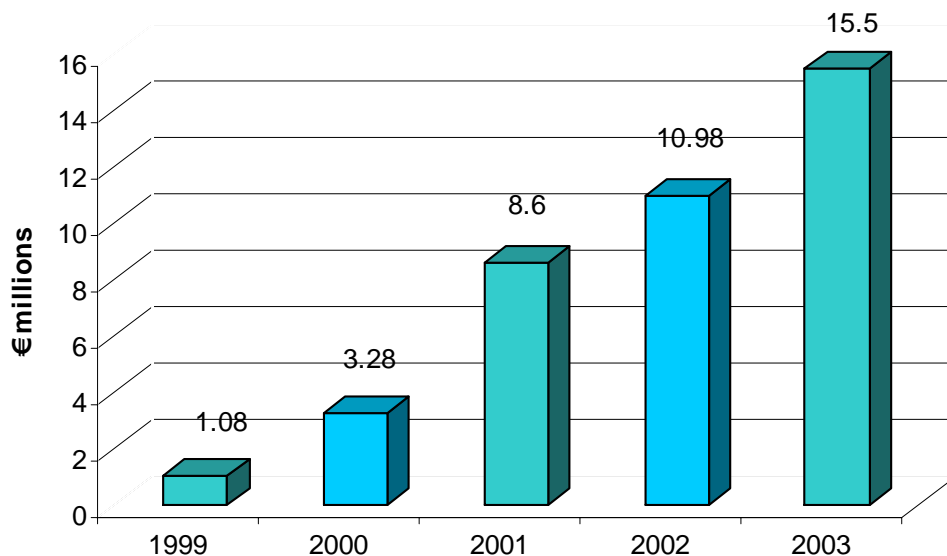


Figure 4.2: Repak Expenditure on Direct Recycling Supports*

Figure 4.3 details the national arisings of packaging waste recycled from 1998 - 2005. The tonnages indicates that Ireland's EU-imposed target for 2001 to recover 25 % (200,000 tonnes) of packaging waste was exceeded by 42,000 tonnes and that Ireland is on target for meeting the 2004 figure.

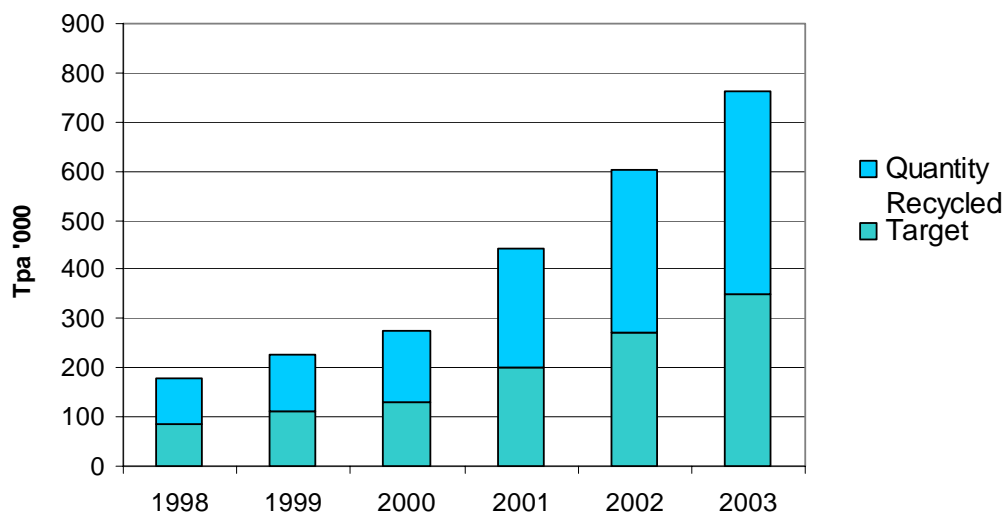


Figure 4.3: Packaging Recycling to Date in Ireland

Figure 4.4, overleaf, shows the quantities of the various waste categories recycled in Ireland in 2002.

* source: Repak Ltd.

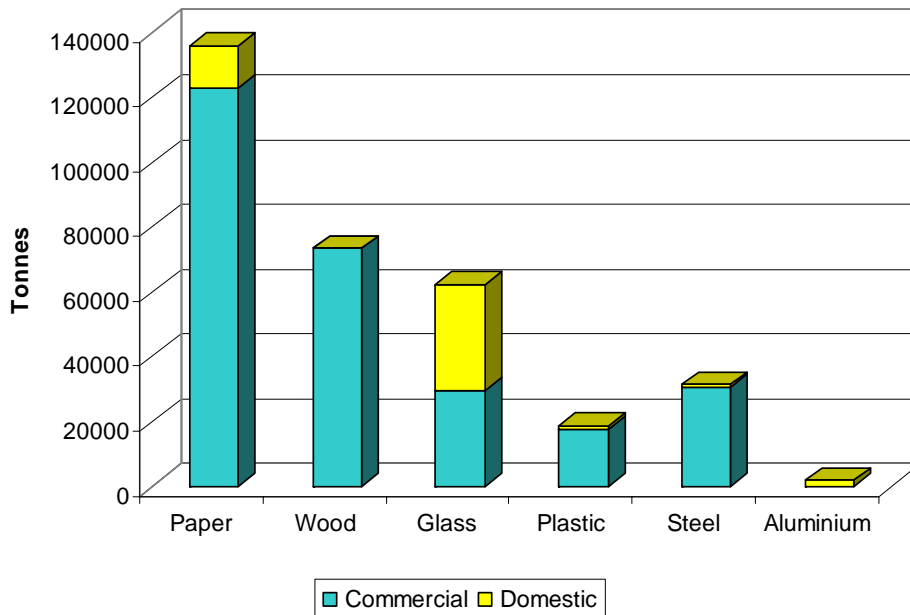
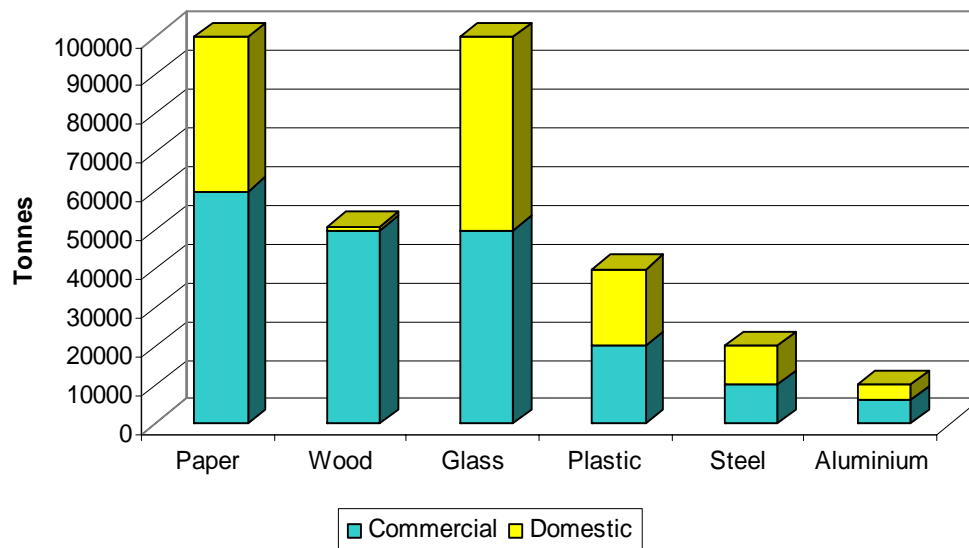


Figure 4.4: Packaging Waste Recycled in 2002*

The EU's packaging waste recovery target for 2005 of 50 % (500,000 tonnes) is challenging. This is an increase of 17% on the 2004 figure. The Directive also sets recovery rates for specific materials which are found in packaging waste with a minimum recovery rate of 15% per material type. The predicted contribution from different packaging waste types for the 2005 deadline is set out in Figure 4.5 below. A target has also been set for 2011 of 60 % recovery and incineration with energy recovery. These higher targets can only be met by significant packaging waste recovery from the household waste stream.



* source: Repak

Figure 4.5: Predicted National Packaging Waste Recovery by 2005*

* source: Repak

5. DRAFT NATIONAL BIODEGRADABLE WASTE STRATEGY

5.1. The Strategy

The Draft National Biodegradable Waste Strategy was published in April 2004. It focuses on biodegradable waste from municipal sources, such as from domestic dwellings and commerce. It is estimated that 65 % of this waste is potentially biodegradable. Table 5.1 shows a breakdown.

Table 5.1 also illustrates that there is huge potential for the additional diversion of biodegradable wastes away from landfill sites. Surveys showed that the diversion rate for 2003 was only 15 %. Accordingly, the Draft Strategy Report indicates that a several-fold increase in recycling and biological treatment capacity is needed to meet national and EU landfill-diversion targets.

Table 5.1: Biodegradable Municipal Waste Generation in Ireland (2001)*

Material (tonnes)	Gross Quantity Available	Landfill	Recovered
paper & cardboard	804,414	638,109	166,305
textiles	60,073	56,013	4,060
organic waste	578,158	555,926	22,233
wood	48,626	7,372	41,254
total	1,491,272	1,257,420	233,852

Table 5.2 illustrates the requirements, showing that the amount of biodegradable waste being landfilled must drop from over one million tonnes to slightly less than 400,000 tonnes by 2016.

Table 5.2: Ireland's Landfill Targets for Biodegradable Waste†

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

The requisite major reduction in biodegradable municipal waste passing to landfill in turn implies the development of alternative waste management capacity. Table 5.3 illustrates the additional infrastructure required nationally. The capacity figures portrayed in this table also accommodate the very significant annual increases in waste generation per capita that has been a feature of waste management in Ireland in recent years. It shows that nationally over 2.5 million tonnes of waste will require treatment by alternative non-landfill technologies by 2016. This figure is very significant - in fact it is greater than the 2001 national biodegradable waste arising shown in Table 5.1.

* Source: Draft Strategy Report of the National Strategy on Biodegradable Waste, Table 2.1

† Source: Draft Strategy Report of the National Strategy on Biodegradable Waste, Table 3.1

Table 5.3: Total Biodegradable Waste Treatment Capacity Required to Meet Ireland's Targets*

Year	Additional Treatment Capacity Needed (tonnes)
2006	1,202,947
2009	1,726,297
2016	2,577,661

5.2. Targets

The Draft Strategy Report sets down a series of interim national targets which are to be achieved by 2009. It states that these are provided in order for local authorities to include the requirements of the Strategy in any review of a waste management plan.

By 2009, the Strategy requires that the diversion of biodegradable municipal waste from landfill sites will increase from a national level of about 300,000 tonnes to nearly 1.8 million tonnes. To achieve this change, the Strategy sets down a number of non-landfill material-specific targets. These are stated to have been derived from the experience of certain EU member states that have a tradition of high landfill diversion levels. Table 5.4 shows the national targets for use of recycling and treatment to process biodegradable municipal waste; also shown is required landfill site level of usage.

It should be noted that the landfill diversion level of 76 % in Table 5.4 appears to exceed the target set by Landfill Directive for 2016. This is because the Directive's targets are based on the 1995 national level of usage of landfill for the disposal of biodegradable waste. Since then, economic growth and other factors have very significantly escalated the quantity of waste arising in Ireland, thereby causing additional challenges to the achievement of the Directive's targets.

Table 5.4: Proposed National Biodegradable Municipal Waste Targets for 2009[†]

	Percentage of Biodegradable Municipal Waste	Tonnes Diverted from Landfill
Recycled	30 %	706,082
Biological Treatment	18 %	424,788
Thermal Treatment	27 %	641,681
Total Landfill Diversion	76 %	1,772,551
Remaining Landfill	24 %	569,881

* Source: adapted from the Draft Strategy Report of the National Strategy on Biodegradable Waste, Table 3.2. These figures assume a waste growth of 3 % per annum.

[†] source: Table 5.1 of the Draft Strategy Report on the National Strategy on Biodegradable Waste

The Draft Strategy Report on the National Strategy on Biodegradable Waste also sets down targets for individual waste streams. Each waste management plan is required to propose arrangements on how these targets are met:

- For paper and cardboard, the recycling targets for 2009 are set at 45% for households and 60% for commerce. It is acknowledged that these levels will require significant investment in both kerbside collection arrangements, as well as “bring” facilities such as civic waste sites.
- 40% of textile waste is to be diverted to recycling and re-use by 2009.
- A national home composting target is set of 7% for all food waste and 40% for the composting of garden waste. As these limits are relatively low, a major national investment is envisaged in the provision of centralised composting facilities for garden waste and for the biological treatment for food waste. The targets for 2009 are 30% centralised treatment of food waste from households, with an equivalent figure for commerce of 40%. 48% of all garden waste is to be centrally composted.
- All of these initiatives will leave a fraction of residual waste. This is estimated by the Draft Strategy Report as comprising 27% of the total biodegradable municipal waste stream in 2009: a total of about 641,000 tonnes. This material is required to be thermally treated directly or subject to mechanical-biological treatment, followed by either thermal treatment or landfill.

The Draft Strategy Report also contains estimates of the regional contribution required for the treatment of biodegradable municipal waste. It suggests that County Kildare will need to put in place 30,000 tonnes of additional capacity by 2006, with these figures increasing to 43,000 tonnes by 2009 and 64,000 tonnes by 2016. As an interim target for 2009, the Draft Strategy indicates that the overall landfill diversion target (i.e. that which embraces both the infrastructure already provided and also the new infrastructure needed to meet relevant targets) for County Kildare is about 53,000 tonnes, being composed of the recycling of 21,000 tonnes of biodegradable municipal waste, as well as the off-site biological treatment of 10,500 tonnes and what the Strategy calls the “residual treatment” of 19,000 tonnes of waste. A small amount of home composting makes up the balance of these figures, while the term residual treatment comprises mechanical-biological treatment (MBT) and/or thermal treatment by incineration.

The Draft Strategy Report on the National Strategy on Biodegradable Waste identifies a range of mechanisms which need to be adopted by local authorities to further the implementation of these targets. For example, waste collection permits issued to private sector operators are required to mandate that separate waste collection systems are put in place, as well as specific requirements for the colour-coding of receptacles. Local authorities are also required to draft bye-laws to govern the acceptable nature of waste presentation, including the mandatory separation of recyclables.

Also stressed is the role of local authority enforcement, which should include the inspection of all authorised waste collectors, the verification of all annual environmental reports supplied by them, the inspection of packaging waste producers and the enforcement of all bye-laws.

6. DEVELOPMENTS IN WASTE MANAGEMENT TECHNIQUES

6.1. Collection Systems

The collection system employed for many years for both household and commercial/industrial waste was a single bin system. In the case of commercial/industrial collections it may have taken the form of a single skip. With the advent of recycling, recovery and diversion targets for different fractions of the waste stream it is now necessary to separate waste streams at source. The most common way of doing this at present is by means of a two bin and three bin collection system. In relation to households this is sometimes described as a kerb side system.

In a two bin system the emphasis is on collecting dry recyclables which normally consist of paper/cardboard, paper/cardboard packaging, plastics and metal packaging in one bin or bag. The second bin contains the remainder of the waste stream and is commonly known as the residual bin. The further processing carried out on each bin is described in later sections.

It is clear that the quality of the recovered recyclables from the first bin will be higher than those which may be processed from the residual bin unless extensive post treatment is carried out.

Bio-degradable wastes which consist of organic wet waste (from household kitchens, gardens, restaurants etc.) and paper/cardboard mainly have diversion targets from landfill set out in the EU Directives. National policy also sets out targets for this material. To achieve a high quality in the recovered material it is necessary to source separate this. This is achieved by means of a third bin. Accordingly a three bin collection system consists of:

- dry recyclable materials such as paper, cardboard, plastic and metal
- bio-degradable waste useful for composting and/or biogasification and consisting of organic waste, green waste and some paper/cardboard fraction
- residual waste which consists of the remainder of the waste stream

The use of the term two-bin or three-bin is a generic term referring to source separation of waste into two or three fractions, however, the container or receptacle for the waste will vary depending on requirements. Examples of containers are cardboard boxes, plastic bags, bins and skips. The type of container is normally regularised and controlled by bye-laws.

The implementation of two or three bin systems also requires that the necessary processing infrastructure is available. For example, when a two bin system is introduced it is necessary to have a dry materials recovery facility to process this waste and a disposal outlet for the residual bin. For example, in a three bin system, it will also be necessary to introduce biological processing of that bin. Treatment/disposal options for the residual bin are either direct to landfill, direct to thermal treatment, processing in a mechanical recovery facility or mechanical recovery and biological treatment (MBT) prior to disposal to landfill or thermal treatment.

Collection systems also include bring sites and civic amenity sites. Bring sites can consist of up to five receptacles or recyclable material, normally clear glass, brown glass, green glass, metal cans and paper/packaging. These are normally distributed at a density of one per thousand of population.

Civic amenity sites, on the other hand, use both bins and large skips to collect a larger range of recyclable materials and may, for example, include for the collection of batteries, waste oil, textiles, garden waste, white goods etc. Civic amenity sites generally cater for the householder and a smaller business unit i.e. smaller shops etc. The density of these is much less and they are normally located adjacent to larger centres of the population and would typically number two or three per county area. These facilities are manned and may charge for use. Civic amenity sites range in sophistication from single level/smaller skip sites to split level collection areas using larger skips and sometimes having secure buildings for the collection and storage of recyclables.

The intent of all the collection systems is to separate the waste into component fractions while achieving high quality in the collected recyclable. This in turn makes it easier to market the collected materials and either obtain payment or reduce the cost of dealing with the recovered waste fractions.

6.2. Biological Treatment

Organic wastes require biological treatment to make them suitable for reuse depending on quality disposal in a landfill. The two forms of the treatment are composting and biogasification.

In the composting process organic waste decomposes into a brown composting like material. Depending on compost quality, it can be reused in a variety of waste. Anaerobic treatment of organic waste produces three components, a liquid digestate, an organic sludge which can be composted and a liquid digestate which can be used as a liquid fertiliser.

The compost material from both processes depending on quality can be utilised as a soil conditioner and fertiliser. This use however raises certain concerns.

There are increasing medical and veterinary concerns related to the use of treated waste as soil conditioners/fertilisers. This is mainly due to the outbreaks of BSE and other animal diseases (foot and mouth and others) and to the proliferation of plant diseases.

The EU is formulating a plan regarding the management of animal by products (animal by-products find their way into separately collected organics at the collection point i.e. kitchen waste from households, restaurants, hotels etc.). The final requirements relating to the use of products which may contain or have been exposed to animal by products are presently not known. They may affect the manner in which treated organic waste is used in agriculture in the future. It can be assumed, at a minimum, that hygienising waste will become an essential requirement. Hygienised is defined as all material reaching a temperature of at least 70 °C for at least one hour. At present the EU is drafting a composting Directive which may deal with these issues.

6.2.1. Composting

The composting process is based on micro-biological digestion of organic waste. This process is generally aerobic, meaning that it takes place in the presence of oxygen. While anaerobic composting can take place, this process is not generally used. The process transforms the carbon in waste to carbon dioxide (CO₂). This process takes place at a higher temperature than the surroundings due to the energy released in the carbon transformation. Shredding, venting and irrigation regulate the composting process.

Composting of waste can basically be divided into three steps, namely:

- pre-treatment
- composting
- screening and maturation

There are different types of composting techniques of which the most common are pile, windrow and reactor composting.

Pile composting and windrow composting use low technique methods. They normally only require the ground to be paved and there should be capacity to collect and treat leachate from the process. On the other hand reactor composting is a high tech process, that is conducted in vessel and does not give rise to weather related leachates. Reactor composting can consist of tunnel composting, box composting, container composting etc.

There is a low carbon to nitrogen (C/N) ratio in household/commercial organic waste, which would result in the process going anaerobic (lack of oxygen), which can result in the formation of odours etc. To maintain the aerobic process (maintain adequate oxygen levels), waste with a higher C/N ratio is required. This is called amendment material. It can consist of park/garden waste etc. Depending on the texture of the organic waste further amendment material in the form of bark or wood chips is added to maintain an open texture and allow aeration of the organic waste.

Source separated household/commercial waste produces the highest quality compost, with quality very much dependant on other waste inclusions. Compost produced from mechanically separated organics generally from residual bins can have high contents of heavy metals and other micro pollutants such as plastics, which may require this lower grade compost to be disposed of to a landfill or even a thermal process.

For compost being disposed of to landfill it requires to be stable and any further degradation to take place at a defined respiration rate. In this case, this material would not be defined as biodegradable material to landfill in the normal sense.

Windrow composting

Windrow composting of organic waste takes place in the open and is suitable primarily for green organic waste (garden waste), in quantities not exceeding approximately 2,000 tonnes. The present difficulty with windrow composting of household/commercial organic wastes which may have been exposed to animal by-products, is that it is not possible to guarantee that all of the waste in the windrow has been subjected to a temperature of 70 ° C for one hour. This may pose issues with regard to reuse of the waste.

Primarily windrow composting in the future may only be suitable for biological treatment of green/organic waste.

Reactor Composting

Reactor composting takes place in a ventilated building, under more controlled conditions than, the low-tech composting technologies. Reactor composting is a much faster process than the low-tech methods but there are much higher investment and treatment costs. Some reactor composting facilities have experienced corrosion and occupational health problems due to the emission of acidic and other gases.

The typical method for larger facilities is tunnel composting is described as follows:

- the waste is shredded and placed in segments 2 - 4 metres wide and 3 - 6 metres high
- air is added in the bottom (venting) together with water
- the waste is turned regularly with a turning machine, working its way through the segment
- the composting period can last from 5 to 12 weeks
- the half-finished compost is replaced in a rotating drum reactor, where the waste will be pre-composted for 1-2 days, before screening, windrow composting and maturing



Figure 6.1: Typical Tunnel Composting Facility

An even more advanced method is a rotating drum reactor in which the waste will be pre-composted for 1 - 2 days before screening, windrow composting and maturing. This method has a very high energy demand.

6.2.2. Biogasification

The biogasification process is based on microbiological, anaerobic digestion of the organic waste fraction. This means that the digestion takes place in the absence of oxygen. The process transforms the carbon in the waste, into carbon dioxide (CO_2) and methane (CH_4), which is combustible. The process produces little heat and therefore requires heating – which can be provided by some of the generated methane. The surplus methane can be used for production of power and/or heat.

There are two main differences between aerobic and anaerobic composting processes. Aerobic transforms the energy in the waste material into heat, which is used in the process. Anaerobic biogasification transforms the energy from the waste into methane gas, some of which can be used to produce external power and/or heat.

The aerobic composting process is technologically simple, whereas the anaerobic biogasification process is complex. A couple of proven technologies are described below.

Dry Biogasification with Park and Garden Waste

This description is based on the Swiss COMPOGAS system:

- paper containers must be used to collect household waste; plastic containers must not be used.
- the collected household waste is passed under a magnetic separator and is mixed with park and garden waste; use a mixing ratio of 1:3, (25% household waste), to give an optimum dry matter content of about 25 %
- the waste material is then shredded to a particle size of less than 40 mm
- the biowaste is mixed with a little de-gassed waste and water, as inoculating material, and fed into the biogas reactor via a heat exchanger with the de-gassed waste. in this way, the biowaste is pre-heated for the process
- the biogas reactor is a vertical, cylindrical container. the biowaste is transported through this cylinder in about 15 - 20 days. the temperature reaches about 55 ° C, (the process is thermophilic)
- the biogas is taken out in the top of the cylinder and used for power and/or heat generation
- the de-gassed biowaste will be dewatered after the process
- most of the wastewater is returned into the process
- the waste is then composted in windrows; only at this stage can the compost be assumed to be hygienised
- the finished compost must be screened before being sold

This process is reasonably robust against impurities such as plastic. It is, however, important to avoid plastic due to its impact on the end product.

Wet Biogasification with Livestock Slurry

The description below is based on commonly applied technology in Denmark. Several biogasification plants based on livestock slurry (pig or cattle) and (liquid) industrial waste are in operation. Some receive and treat household organic waste.

The main component in the facility is livestock slurry. This will be no less than 75% (by weight and volume), of the total amount treated. Household waste should not constitute more than 15% of the total, and normally 5 -10% is preferred. The concept assumes that at least ten times as much livestock slurry as household waste is available for treatment and that farmers will take the de-gasified slurry (now mixed with other waste) back as fertiliser.

Household waste can be collected by any means, as it must be pre-treated before gasification. However, Danish experience suggests that plastic is always a problem. At least one Danish plant is presently at a standstill and facing a significant problem due to the accumulation of plastic in the reactor tank – in spite of pre-treatment that is assumed to remove plastic.

The wet biogasification, with livestock slurry, process is outlined below:-

- the three waste categories (household slurry, industrial waste and household waste) are received separately
- the household waste is pre-treated according to the needs of the collection scheme; it must pass a magnetic separator and a shredder - two shredders are often applied (one coarse and one fine)
- the waste is mixed in a mixing tank with a holding capacity of a couple of days; this ensures a uniform biomass quality and also serves as a buffer capacity at weekends, when no waste is received

- the gasification takes place in the reactor tank; biomass is constantly added and discharged
- the average hydraulic retention time is 15 - 20 days - an agitator keeps the biomass moving
- process temperature is normally mesophilic (at temperatures between 35 ° C and 40 ° C)

Due to the low process temperature and the fact that the de-gasified biomass (slurry) is used directly as a fertiliser, the biomass has to be "hygienised". This will normally take place in a separate holding tank where the biomass is heated to at least 70 ° C for at least one hour. This is normally done before the biogasification in the reactor tank in order to obtain a sufficiently high temperature for the process.

The generated gas can be used for power and/or heat production. The enriched slurry is returned to the farms, for storage, until it is applied to land.

Biogasification of household organic waste with livestock slurry requires a relatively high concentration of farms with large stock, as it is expensive to transport slurry over long distances.

The biogasification process for livestock slurry and "clean" industrial waste fractions has proven quite reliable. Without pre-treatment, extension of the process to include household organic waste has encountered the following difficulties:

- the system is susceptible to clogging from primarily plastic residues in the household waste
- particles in the household waste (soil, grit, ceramics etc.) result in wear and tear on pumps, pipes etc.; this results in increased maintenance costs and breakdowns compared to a facility without this waste category

6.3. Waste Recovery and Stabilisation Processes

At present waste in the residual bin is dealt with by means of disposal to landfill primarily. This waste contains a range of waste fractions which include organic, recyclable, combustible and non-combustible streams. This waste stream would be co-mingled and cross-contaminated. It is possible however to further treat this waste prior to disposal and this can be achieved by various means with various outlets for end products. The more common of these are:

- mechanical recovery only of certain higher value recyclable fractions with the remaining waste stream being disposed of to thermal treatment with energy recovery
- mechanical recovery of higher value recyclables, recovery of the biodegradable fraction and its subsequent stabilisation, with the remaining residual fraction being disposed of to landfill; this pre-treatment process prior to landfill is commonly known as mechanical biological treatment (MBT)

When the final disposal route is landfill then the residual waste stream is subject to the requirements of the Landfill Directive and National Targets for diversion of waste from landfill, in particular, biodegradable waste. The waste stabilisation process carried out as part of MBT is a composting process. The degree of composting of the biodegradable materials has to be such that it is no longer biodegradable or at least that its respiration rate is below a certain threshold. In general, compost recovered through an MBT process is higher in contaminants than source separated compost and may not be suitable for horticulture or land use. In this event the primary outlet for this stabilised material is landfill. Its use as top cover in landfill is also limited due to the presence of contaminants previously noted and the limited quantity of this type of material required for landfill restoration.

There are a number of differing technologies which can be used for waste recovery and stabilisation, all processes have the effect of reducing the volume of biodegradable residual waste to be disposed of. Certain processes produce a fuel from the stabilised waste residue and this is commonly referred to as refuse derived fuel (RDF).

A typical process could be described as follows:

The waste entering the recovery and stabilisation process is unloaded in a covered building under negative pressure. Some of the waste is extracted at this stage for specialised treatment e.g., hazardous waste, bulky items etc.

Waste is then conveyed to the materials recovery hall where it is passed through a screening process. Over size material is automatically separated and this consists mainly of papers, plastics and packaging. Undersized material consisting of organics, grit etc. is passed through a second screen.

Glass can be removed at this stage, if required, by opto-electronic means. Metals are extracted from the waste stream using magnets.

The remaining material is then shredded and undergoes either a composting or biogasification process as described earlier. In processes which contain a biogasification element the solid waste is ultimately composted.

The recyclables recovered during the overall process are metals and plastics. If a refuse derived fuel is not being generated from the process either for co-combustion or thermal treatment with energy recovery then there is a debate about the utilisation of the lower value recovered fractions. As noted above, these may only be suitable for disposal at a negative value or disposal to landfill.

6.4. Thermal Treatment

There are two means of thermal treatment of waste; aerobic and anaerobic, (with or without oxygen).

Anaerobic Processes (Gasification/Pyrolysis)

Anaerobic processes are gasification/pyrolysis. Waste is heated in a closed chamber without oxygen or with oxygen deficit. The waste is decomposed and releases gas (methane, CH₄), tar, and a solid residue. The generated gas is subsequently cleaned and burned together with the generated tar, thus generating energy.

No anaerobic treatment processes for household waste (MSW) are presently developed on proven scale.

They have been tested for several years, and some progress has been made. Smaller gasification systems currently being trialled/commissioned are described in other "waste management techniques" further on.

Aerobic Processes (Incineration)

Aerobic thermal treatment is also referred to as incineration. There are three basic technologies applicable for this:

- fixed bed incineration
- fluidised bed incineration
- incineration on a moving grate

Figure 6.2: View of Thermal Facility - Denmark



These technologies are described as follows:

- a) Fixed bed incineration is normally batch-fed. It is commonly used for special waste such as clinical waste, where it is important to control the waste completely. Fixed bed incinerators are not fit for mass burning of municipal waste due to low capacity feeding mechanisms.
- b) Fluidised bed incinerators provide in certain cases better combustion and less emissions than the other incineration categories. Due to the characteristics of the (fluid) sand bed, the incinerator requires homogeneous fuel. Pre-treatment of municipal waste by crunching or shredding is therefore necessary. Such treatment is expensive, and fluidised bed incineration is therefore presently not commonly applied in municipal waste thermal treatment.
- c) Mass burning on a movable grate is the dominating thermal treatment method for municipal waste. It accounts for at least 99% of municipal waste incineration throughout the world. Mass burn incinerators come in many variations with regard to grate, air, cooling, flue gas treatment technology, but the overall concept is as follows:
 - Incoming waste is discharged into a bunker where it is stored and mixed by means of an overhead crane or grab. The same grab is used to load the waste into a hopper/or conveyor leading to the burning chamber.
 - The waste is then discharged onto the grate. At the grate, the waste is rather moist, so the first step in the treatment process is that the heat generated in the chamber dries the waste. Subsequently, combustible gases are driven out of the waste in a pyrolysis process and are burned in and over the waste layer on the grate.
 - Further down the moving grate the waste is burned out fully until the only residue is a slag. The slag falls into cooling water and is transported to a slag bunker. The slag may, depending on quality, be used as filling material in road construction and similar activities. The amount of slag is normally in the magnitude of 20% by weight and 5% by volume of the waste fuelled into the plant.
 - The flue gas from the combustion process is burned out fully in the furnace above the grate. Normally the energy content in the waste, suffices to reach the required flue gas temperature of, 850°C for at least 2 seconds. In order to ensure this, during start-up and abnormal operation situations, all mass-burn incinerators are provided with a gas or oil fuelled auxiliary burner in the after-combustion chamber.
 - The hot gas is then cooled in a boiler, generating hot water or steam, used for district heating and/or power production.

The flue gas is extensively cleaned before being discharged into the environment via a stack. The involves at least two and at some facilities all of the following processes:

- dust removal in an electrostatic precipitator
- removal of acidic components and heavy metals in one or more scrubbers (dry or wet)
- dust and fine particles removal in a bag filter

Further to this, many plants add activated carbon and a final bag filter for removal of dioxins and mercury and catalytic or non-catalytic reduction of nitrogen oxides (NO_x) in the flue gas.

The flue gas treatment results in residues (fly-ash), which presently cannot be made into usable materials and therefore must be disposed of in a class 1 landfill facility or similar. The amount of residues depends on the waste and the purification process used. This is normally in the magnitude of 1-3% of the amount of waste fuelled into the plant. Wet scrubbers also result in wastewater being generated, but the wet process results in the least amount of solid residues. This wastewater has a low content of pollutants, but a rather high content of chloride (salt). Wet scrubbers are therefore normally only applied in places where discharge can take place directly to a marine recipient.

The operation of incineration plants in the EU is regulated by the Directive on the Incineration of Waste (2000/76/EEC) which was adopted in December 2000.

6.5. Other Waste Management Techniques

With regard to thermal treatment of waste, there are a number of companies now offering smaller systems. These involve pyrolysis and/or gasification and are being offered in the 60,000 tonne/annum size range (approximately). Examples include:

Brightstar Environmental

Brightstar Environmental's system includes:

- material recovery system for recyclables
- gasification of the residual waste
- power generation from the gas produced

This system is in operation in Wollongong near Sydney, Australia, and will treat an estimated 30,000 tonnes/annum initially.

Compact Power

This system is described as advanced thermal conversion by the promoters and includes:

- pyrolysis and gasification
- high temperature oxidation
- energy recovery

Entry size for the system is 30,000 tonnes/annum, ranging to 60,000 tonnes/annum.

It should be noted that none of the gasification processes have proven themselves at full-scale operation, i.e., continuous operation for 8,000 hours at full treatment.

There have been advances reported also in biological treatment of the organic waste fraction. These include vermiculture, in vessel composting and small-scale biogasification. Examples are noted below.

- Bioverm – Australian vermiculture system producing soil conditioner and fertiliser
- box composting – Glas Aris system, producing compost
- in-vessel Composting – Vertical Composting Unit (VCU), Greenstar Recycling Ltd., producing compost
- anaerobic digestion – Methanogen system producing compost and energy

6.6. Landfill

The location, design and control of modern landfills is set out in Council Directive 99/31/EC on the landfill of waste and by licence conditions imposed under the Waste Management Act 1996. It's objective is "by way of stringent operational and technical requirements on the waste and landfills, to provide for measures, procedures and guidance to prevent and reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from landfilling of waste, during the whole life-cycle of the landfill."

Relevant technical requirements are also set out in this Directive.

6.6.1. Site Selection

The section "Overview of the Region" in Volume 2 of this document describes the fundamental characteristics of County Kildare. This was done by way of a desk study. Areas generally suitable for non-hazardous waste landfill in the region have been identified and are shown in Figure 1.5 of Volume 2 of this document. Field work will be required to verify the suitability or otherwise of any particular location.

6.6.2. Modern Landfill Design

Modern landfills have the following key design components:

- impermeable base and sides
- leachate collection and disposal system
- impermeable cap with dedicated gas collection system
- other design aspects
- operational and monitoring requirements

Figure 6.3: View of Modern Landfill – Arthurstown, Co. Kildare



Impermeable Base and Sides

Impermeability of the base and sides of a landfill is normally achieved through the following:

- site suitability – provides a geological barrier through all phases of the landfill life, i.e., operational, and post-closure
- artificially established engineered clay barriers of not less than 0.5 m thickness can also be used
- liner systems to provide protection during the operational/active phase of the landfill (this liner system typically consists of one metre of engineered clay having permeability $k = 1.0 \times 10^{-9} \text{ ms}^{-1}$ and a 2.5 mm High Density PolyEthylene (HDPE) bottom & side liner

Leachate Collection System

The leachate collection system will generally comprise the following:

- artificial sealing liner required (typically 2.5 mm HDPE noted above)
- bottom drainage layer greater than or equal to 0.5 m in thickness
- collection pipework is normally provided in the drainage layer - these drain to a pumping system for subsequent treatment

Landfill Cap

The landfill cap normally comprises the following:

- gas drainage system to provide for the control and capture of landfill gas
- impermeable system
- drainage, subsoil and topsoil layers

Other Design Aspects

Other design aspects of a modern landfill will normally include:

- stormwater collection, control and storage system prior to discharge
- leachate pre-treatment/treatment systems prior to removal offsite or discharge
- gas utilisation and/or flaring systems
- groundwater, leachate, surface water, gas and air monitoring systems
- waste monitoring systems

Operational and Monitoring Requirements

There are stringent operational and monitoring requirements for modern landfills, which include:

- supervised and recorded waste entry with dedicated inspection and quarantine areas
- weighbridge recording of all wastes
- litter, vermin and odour control systems
- monitoring of groundwater, gas levels and leachate levels
- monitoring of air quality
- provision of environmental management system

All of the above design and operational parameters, are regulated by the Environmental Protection Agency (EPA), through a statutory waste licensing system. This system also requires financial sureties to ensure the aftercare period of the landfill is dealt with. The EPA has also published guidance notes on various aspects of landfill site selection, design, operation and closure.

6.6.3. Types of landfill

The Directive classes landfills into one of the following:

- landfill with hazardous waste
- landfill for non-hazardous waste
- landfill for inert waste

Landfills for hazardous waste and inert waste are generally provided by the private sector in response to the waste market. Local authorities traditionally have provided landfills for non-hazardous waste (typically municipal waste). Increasingly, however, the private sector are becoming involved in their provision.

Regardless of whether landfill is provided by the private or public sector the same stringent design and operational parameters apply.



Figure 6.4: Weighbridge Control – Arthurstown, Co. Kildare

6.7. Recycling of Construction & Demolition Waste

A typical facility for the treatment and recycling of construction and demolition waste in Ireland is located at the Kinsale Road Landfill in Cork City. It is assisted under the EU Life Program and is run by Cork City Council. It processes approximately 250,000 tonnes of material per annum, producing the following materials for reuse:

- 150 – 100 mm granular material
- 100 – 50 mm granular material
- 50 – 01 mm subsoil type fines material

The facility has a staff complement of five, and uses the following mobile plant items:

- crusher
- screener
- loading shovel
- excavator



Figure 6.5: Recycling of Construction & Demolition Waste at Kinsale Road Sanitary Landfill