



# National Waste Report 2004

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## **National Waste Report 2004**

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# EXECUTIVE SUMMARY

The *National Waste Report 2004* presents the latest available national statistics on waste generation and management in the Republic of Ireland. The Report is prepared under the auspices of the National Waste Prevention Programme. The Report provides data that:

- ❑ highlight trends in waste generation and management;
- ❑ illustrate progress towards national and EU targets on the recycling of waste and its diversion from landfill; and
- ❑ will be used in preparing national reports in relation to the EU Waste Statistics Regulation, the Packaging Directive, the Basel Convention and other international obligations.

The profile of municipal waste has changed dramatically in the last 5 years or so. These changes are apparent in two principal contexts – the continued increase in recycling and the consequential change in the composition of landfilled waste. The influence of successful collection schemes for municipal recyclables can be seen plainly in the reduced proportion of packaging and other materials in landfilled waste, as measured during a national municipal waste composition survey undertaken in 2004/5. The landfilling of municipal waste continued to decrease in 2004, by 0.8%. Since 2001, municipal waste landfill has decreased by 8.7%.

Municipal waste generation increased by 4% in 2004 to just over 3 million tonnes<sup>1</sup>. Despite international reports to the contrary, it is not clear how Ireland compares to other countries in regard to municipal waste generation<sup>2</sup>. The 2002 EU Waste Statistics Regulation is intended to harmonise EU-wide reporting on waste and it is anticipated that comparable results for 2004, from across the EU, will be available in 2006/7.

Recycling rates for municipal waste are generally rapidly increasing:

- ❑ Municipal waste recovery in 2004 stands at 34%, compared to 28% in 2003. The national target of 35% recycling by 2013 has almost been achieved well ahead of schedule and may need to be revised to present new challenges and build on this success.
- ❑ Household waste diversion from landfill now stands at 19%, compared to 13% in 2003. However, there is still some distance to go to the 50% landfill diversion target for 2013 that will also be influenced by the commencement of municipal waste incinerators.

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<sup>1</sup> This calculation is based on a new methodology, outlined in section 3.1.

<sup>2</sup> According to the European Environment Agency (EEA), Ireland ranks as the largest per capita generator of municipal waste in the EU. The EEA acknowledges however that data are in general not comparable and, in many countries, are based for the most part on household waste and often exclude recycled wastes (*The European Environment: State and Outlook 2005*. EEA, 2005). In Ireland, by way of contrast, 40% of municipal waste generation in 2004 is comprised of commercial waste and 34% is comprised of recycled waste. Another, privately-commissioned, study supports the hypothesis of considerable variability between countries' calculation methods.

- ❑ Packaging waste recycling now stands at 56%, a year ahead of the 2005 target of 50% recycling. The focus should now shift to packaging prevention, analysing use patterns and promoting eco-design.

The diversion of biodegradable municipal waste from landfill has, in contrast, shown little progress. It remains a considerable challenge to achieve the landfill diversion targets for biodegradable municipal waste set down in the Landfill Directive. The forthcoming *National Strategy for Biodegradable Waste* will dictate the approach that will be taken towards achieving these ambitious targets.

Data and information on construction and demolition waste has come under particular scrutiny in the last year. Local authorities reported the collection of some 11 million tonnes in 2004. This reflects a trebling of the last national estimate of 3.6 million tonnes in 2001. A provisional recycling rate of 85% is estimated for 2004. However, there are uncertainties in this dataset. An intensive auditing exercise will be undertaken in 2006 by the EPA to establish the robustness of the data reported by construction and demolition waste contractors and facility operators.

There are no significant trends to report in the generation and management of industrial waste. An estimated 9.6 million tonnes was generated in 2004. Recovery and disposal rates have remained relatively static at 65% and 35% respectively in 2004. Under the National Waste Prevention Programme, the EPA will, in 2006, begin a process of documenting success stories in waste prevention, minimisation and management in Irish industry.

Hazardous waste generation increased to 723,921 tonnes, including 307,340 tonnes of contaminated soil. The export of hazardous waste for treatment abroad continues to increase. The sustainability of this practice from environmental and strategic viewpoints will be examined in 2006 in the context of the review and Strategic Environmental Assessment of the *National Hazardous Waste Management Plan*.

The provision of waste management infrastructure continues to improve:

- ❑ There were 1,929 bring banks at the end of 2004 and 69 civic waste facilities.
- ❑ The number of municipal waste landfills decreased by one to 34 – two landfills closed in 2004 and one opened.
- ❑ Remaining landfill capacity nationally remains at an estimated 8 years, though there is considerable variation between regions.
- ❑ The provision of hazardous waste landfill capacity remains a gap in Irish waste management infrastructure that, when available, will eliminate the need to export over 5,000 tonnes of hazardous waste for disposal, principally to Germany.
- ❑ Two commercial incinerators were licensed by the EPA in 2005 for the treatment of municipal, industrial and hazardous waste.



In response to the changing focus of EU and Irish policy on waste management, and the success in municipal waste recycling, a number of initiatives are ongoing that aim to bring about reductions in waste generation and improvements in materials use and management. These include, the National Waste Prevention Programme, the Race Against Waste, the Cleaner Greener Production Programme and Enterprise Ireland's Environmentally Superior Products Programme. This illustrates the scale of resources that have been allocated to waste and pollution prevention and to changing of attitudes and awareness of individuals and organisations alike. The vanguard of national waste policy is perceptibly shifting towards prevention and this will be the most challenging of today's waste issues. The recycling of waste and improving waste management represent technical, logistical and engineering problems. Prevention requires cultural and behavioural change and should be built up over a longer period of time. It is important that funding remains available to these and other programmes for the long term.

## ACKNOWLEDGEMENTS

The cooperation of all respondents to EPA questionnaires and assistance with queries during the preparation of this report is gratefully acknowledged. We would particularly like to acknowledge the time and assistance provided by individuals in local authorities, recycling organisations and industrial enterprises. Much of the data reported here is based on reports from EPA-licensed facilities and we are indebted to our colleagues in the Office of Environmental Enforcement for their part in obtaining and verifying this information. Particular gratitude is due to Ms. Jane Brogan. The assistance of other EPA colleagues who helped in any way with the preparation of this report is also gratefully acknowledged.

Gratitude is also due to Enviro Consulting Limited, who worked on behalf of the EPA in the collection, compilation and validation of information from local authorities, recycling organisations and EPA-licensed facilities for 2004. The assistance of staff in a number of other organisations is also acknowledged, including Teagasc, Repak and the Central Statistics Office.

# 1. INTRODUCTION

## 1.1 Background

This report is the latest in the series of National Waste Reports prepared and published by the Environmental Protection Agency. Previous reports have been published for a number of years between 1995 and 2003<sup>3</sup>. The report is now published as part of the National Waste Prevention Programme<sup>4</sup> in order to improve the availability of waste information especially in relation to prevention. The reported data is in line with the EU Waste Statistics Regulation<sup>5</sup>. In the future, it is intended to publish a detailed national waste report every second year, in accordance with the Waste Statistics Regulation's reporting schedule, and a shorter interim report every other year.

The availability and quality of waste management information has improved since the first *National Waste Database Report* in 1995, as waste management practices and regulation have continued to evolve and mature. All legal waste management operations are now regulated by the EPA or local authorities. The focus of effort has shifted to rigorous enforcement actions where considerable progress towards the elimination of unauthorised waste activity has been reported.

The objectives of this report are:

- ❑ to present the most up to date information available on waste generation and management in Ireland, as reported to the EPA;
- ❑ to illustrate trends in waste generation and management;
- ❑ to describe current and planned waste management infrastructure; and
- ❑ to make recommendations on future needs regarding waste management information and practices.

## 1.2 Scope and structure of the report

The EPA is responsible for producing national statistics on waste<sup>6</sup> generation and management in the Republic of Ireland, in addition to information on waste exports and imports. This report presents information for the calendar year 2004. It also presents the most up to date qualitative information available on waste management infrastructure and initiatives towards waste prevention and recovery targets. Generators of waste described in this report include householders, commercial premises, industrial operations and agriculture. Additionally, the nature, quantity and management routes for waste

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<sup>3</sup> *National Waste Database* reports for the years 1998, 2001, 2002 and 2003 are available at [www.epa.ie/ourenvironment/waste](http://www.epa.ie/ourenvironment/waste).

<sup>4</sup> More information at [www.epa.ie/ourenvironment/waste](http://www.epa.ie/ourenvironment/waste).

<sup>5</sup> Regulation (EC) No. 2150/2002 of the European Parliament and of the Council of 25 November 2002 on waste statistics.

<sup>6</sup> Waste is defined in the Waste Management Acts, 1996 to 2005 and in summary means any substance or object that the holder discards or intends or is required to discard, regardless of whether that substance or object has a value or can be recycled.

are described. This report presents a national overview of waste and commentary on the current situation in Ireland. A series of factsheets, providing more detailed waste information, support the information presented in this report<sup>7</sup>.

### **1.3 Data sources**

The following principal data sources were used in compiling the information presented in this report:

- ❑ Local authority survey – annual EPA questionnaire;
- ❑ Recycling organisations survey – annual EPA questionnaire;
- ❑ Annual Environmental Reports from EPA waste-licensees (landfills, hazardous waste treatment facilities and transfer stations);
- ❑ Annual Environmental Reports from EPA IPPC-licensees (large industrial facilities);
- ❑ Industry survey – sample survey of non-IPPC licensed companies; and
- ❑ Municipal waste composition survey – results from a major project commissioned by the EPA under the National Waste Prevention Programme.

All other data sources used are indicated in footnotes throughout the report.

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<sup>7</sup> The factsheets are available to download from the EPA website at the following location:  
<http://www.epa.ie/OurEnvironment/Waste/NationalWasteDatabase/>

## 2. THE NATIONAL WASTE PROFILE

The profile of waste generated in Ireland is presented in this section and the total quantity generated in 2004 is presented in Table 1. The total estimated generation of waste in Ireland in 2004 was 85,256,685 tonnes, an increase of 11,185,051 tonnes since 2001. The bulk of this increase can be attributed to an increase in the estimated quantity of construction and demolition waste. Agricultural waste represents the largest proportion of overall waste generation, accounting for an estimated 60,175,025 tonnes in 2004. Non-agricultural waste consists mainly of construction and demolition, manufacturing, mining and quarrying and municipal wastes. The proportion of non-agricultural waste has increased from 23.5% in 2001 to 29.4% in 2004. The national profile of waste generated in 2004 is illustrated in

Figure 1.

**Table 1 Total waste generation in 2004**

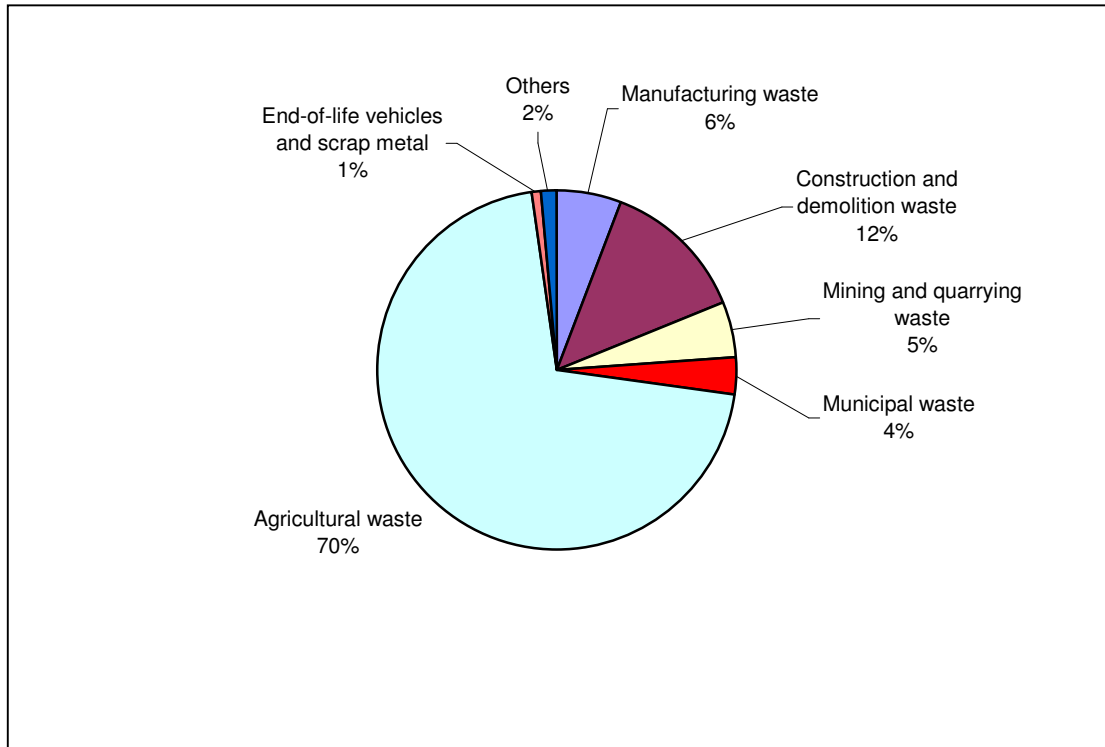
Waste category	2004	
	Tonnes	%
Construction and demolition waste	11,167,599	13.1
Manufacturing waste	5,044,243	5.9
Mining and quarrying waste	4,044,511	4.7
Municipal waste	3,034,566	3.6
End-of-life vehicles and scrap metal	491,860	0.6
Hazardous waste	366,291	0.4
Contaminated soil	307,340	0.4
Energy, gas and water supply waste	284,647	0.3
Dredge spoils	238,565	0.3
Drinking water sludges	59,741	0.1
Urban wastewater sludges	42,298	0.0
<b>Sub-total non-agricultural waste</b>	<b>25,081,660</b>	<b>29.4</b>
Agricultural waste	60,175,025	70.6
<b>Total</b>	<b>85,256,685</b>	<b>-</b>

The profile of waste generated in Ireland has changed somewhat since it was last reported in 2001. Although agricultural waste continues to account for the greatest proportion, that proportion is reduced from 76.5% in 2001 to 70.6% in 2004. The estimated quantity of non-agricultural waste increased from 17,384,194 tonnes in 2001 to 25,081,660 tonnes in 2004. The principal change in this dataset is construction and demolition waste – this sector is now the greatest single non-agricultural waste generator accounting for 45% of all non-agricultural waste.

The availability and reliability of information on waste continues to improve. The waste collection permit regulations came into operation in November 2001<sup>8</sup> and it is likely that the increased quantities of some waste streams reported are as a result of ongoing improvements in compliance and reporting under these regulations. This will be further discussed in the relevant sections below. Extensive data

<sup>8</sup> Waste Management (Collection Permit) Regulations, 2001 (S.I. No. 402 of 2001), as amended by S.I. No. 540 of 2001.

verification audits were carried out by the EPA during 2005, to examine documentation in support of reported construction and demolition waste collection and packaging and non-packaging waste recycling. Further information on the findings from these audits is provided in the relevant sections below.



**Figure 1 National profile of waste generated in 2004**

Waste management options have changed significantly since 2001 and these changes are readily visible in the municipal waste stream in particular, for various reasons. For example:

- ❑ Commercial premises are now obliged<sup>9</sup> to segregate at source and present certain specified packaging waste materials for recovery, leading to an effective ban on landfill of these materials;
- ❑ Pay-by-use household waste collection systems, obligatory since January 2005, were operated by many local authorities and private operators in 2004, with associated separate collection of dry recyclables directly from households; and
- ❑ The development of home composting schemes is one of the most visible local authority initiatives to divert biodegradable waste away from landfill (many local authorities provide subsidised home composting units). Local authorities are also increasingly providing “brown bins” for the kerbside collection of household organic waste.

Along with technical solutions, significant changes are evident, and need to be reinforced, in changed attitudes and behaviours of the public and business. A number of initiatives are ongoing that aim to bring

<sup>9</sup> Waste Management (Packaging) Regulations, 2003 (S.I. No. 61 of 2003).

about a paradigm shift from the traditional end-of-pipe attitude to waste management (bin it and forget it) to a more proactive approach to waste prevention, minimisation and recycling. It is expected that the initiatives listed below, amongst many others, will increase awareness and provide support to householders and business alike with a view to maximising waste prevention.

- The National Waste Prevention Programme was launched by the EPA in April 2004 following commitment made in the Government policy document “Preventing and Recycling Waste – Delivering Change” and initial funding of €2 million was provided. A number of projects are currently ongoing or planned in support of local authorities and the wider public and private sectors towards increasing awareness and providing technical and financial support in pursuit of waste prevention and improved waste management practices generally.
- The high profile Race Against Waste<sup>10</sup> communications campaign, commissioned in 2003 by the Department of the Environment, Heritage and Local Government, targets householders and businesses with the aim of reducing, reusing and recycling waste wherever possible. The Race Against Waste is now in its third year.
- An Taisce run the Green-Schools Programme<sup>11</sup> in cooperation with local authorities. This is an international environmental education programme to promote action for the environment within the whole school. In Ireland, there are more than 2,000 schools involved, representing more than half the schools in the country. Known internationally as Eco-Schools, there are currently 37 countries involved.

These and many other initiatives are expected to deliver changes in behaviour in relation to waste on the part of the individual and Irish society as a whole. The rollout nationwide in recent years of collection services for household recyclables serves to illustrate that behaviours can be positively changed. Waste recycling is becoming firmly embedded as part of Irish culture. The challenge is to achieve the next step up the waste hierarchy and bring about a reduction in the quantity of waste generated as well as decoupling waste generation from economic growth.

### 2.1.1 Conclusions

- C1 The profile of Irish waste continues to change. Agricultural organic waste remains the greatest single waste stream. Waste from construction and demolition activities, manufacturing industry, mining and the municipal sector are the principal sources of non-agricultural waste.
- C2 It is clear that increasing attention is being paid by Government, local authorities, the EPA and certain sectors of society to waste prevention. A range of initiatives have commenced in recent years to create awareness of the issues and to create the environment in which prevention can take place. There is little quantitative evidence of

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<sup>10</sup> For more information, refer to the Race Against Waste website: [www.raceagainstwaste.ie](http://www.raceagainstwaste.ie)

<sup>11</sup> For more information refer to the An Taisce website: [www.antaisce.org/projects/greenschools.html](http://www.antaisce.org/projects/greenschools.html)

waste prevention as yet. However, this is hardly surprising – while an organisation may rightly celebrate the elimination of 100 tonnes of waste, this will hardly feature in aggregate national waste statistics.

### 2.1.2 Recommendations

- R1 Prevention is not yet evident in waste statistics at the macro level. Research to demonstrate prevention at enterprise level should be prioritised. Commitment to the National Waste Prevention Programme should continue and be allocated sufficient resources to foster and guide the relevant stakeholders and participating enterprises. There are a number of highly qualified and experienced professionals in the private, public and educational sectors – such expertise should be developed and harnessed through continued research funding and contractual commitment to organisations that can provide advice and assistance on waste prevention from the technical and social sciences points of view.
- R2 Waste data management has evolved significantly since the *National Waste Database* report series was commenced. The data increasingly revolves around waste treatment operators and the mapping of waste flows to and from waste recovery and disposal facilities. New proposals designed to combine waste reporting with waste enforcement are in train and will be further developed in 2006. Waste data provides the foundation for waste management planning and allows progress to be quantified and reported upon. Waste data is scrutinised and queried at ever increasing levels of detail and the data should therefore be credible and supported by audits and other verification exercises. The continued development of waste information management systems at local and national levels should be actively supported and allowed to evolve into the future.



### 3. MUNICIPAL WASTE

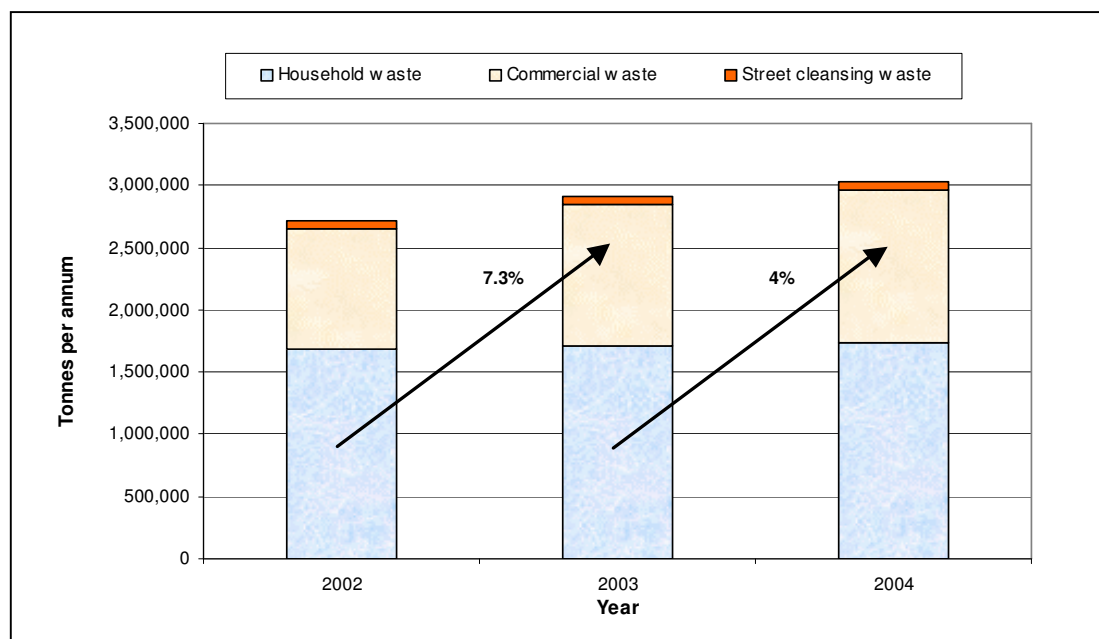
#### 3.1 Municipal waste

In 2004, a total of 3,034,566 tonnes of municipal waste was generated in Ireland – a 4% rise over 2003. This amount represents a significant slowing down in the rate of municipal waste growth when compared to 2003, as indicated in Table 2 and Figure 2. The data is based on the known quantities of municipal waste managed by authorised operators, plus an estimate of uncollected household waste. Note that the methodology used to calculate the municipal waste figure differs from previous years, as explained below.

**Table 2** Municipal waste generation, 2002 to 2004

	2002 <sup>12</sup> (tonnes)	2003 <sup>12</sup> (tonnes)	2004 (tonnes)
Household waste <sup>13</sup>	1,679,068	1,704,844	1,737,416
Commercial waste <sup>14</sup>	975,744	1,141,264	1,227,489
Street cleansing waste	65,573	71,779	69,661
<b>Total municipal waste</b>	<b>2,720,385</b>	<b>2,917,886</b>	<b>3,034,566</b>

(Source: landfill annual environmental reports; recycling organisations survey; local authorities)



**Figure 2** Trends in municipal waste generation, 2002 to 2004

<sup>12</sup> Municipal waste generation estimates for 2002 and 2003 have been revised according to the new methodology in use in this report.

<sup>13</sup> Household waste includes: managed household waste (landfill and recovery); estimate of “uncollected” household waste exported household waste not otherwise accounted for.

<sup>14</sup> Commercial waste includes: managed commercial waste (landfill and recovery, including landfill of non-process industrial waste); exported commercial waste not otherwise accounted for.

The revised methodology is based on information obtained directly from:

- ❑ EPA-licensed municipal landfills – the data is checked by the Office of Environmental Enforcement as part of compliance auditing of landfill licences;
- ❑ Organisations engaged in waste recovery – data for 2004 was verified by the EPA by way of site visits to organisations responsible for 65% of the total reported quantity; and
- ❑ Local authorities – including an estimate of uncollected household waste according to a standardised methodology used by all local authorities; street cleansing waste; and notified<sup>15</sup> municipal waste exports not otherwise accounted for.

The methodology used in previous years was based on information provided by local authorities, based in turn on reports from waste collection permit holders. There is however no evidence of verification exercises being undertaken by local authorities at the premises of waste collection permit holders. This was particularly highlighted during six EPA audits of construction and demolition waste data compiled by local authorities, during which it became clear that verification checks were not being carried out. Unverified data on waste cannot be relied upon. The one exception noted was Meath County Council, which commenced a verification programme in 2005.

The EPA is charged with the production of national statistics on waste generation and management. This information is used by many decision- and policy-makers and it is the EPA's responsibility to publish the most accurate and reliable information available. The data presented in this report is strategically important at national and EU level. Therefore the EPA will only present information on waste that has been validated and verified to an acceptable level. Research will be undertaken in 2006 by the EPA in collaboration with local authorities to establish the extent to which information provided by collection permit holders is reliable and verifiable.

The European Environment Agency (EEA) has reported<sup>16</sup> that Ireland ranks as the largest per capita generator of municipal waste in the EU. The EEA acknowledges however that data are in general not comparable and, in many countries, are based for the most part on household waste and often exclude recycled wastes. In Ireland, by way of contrast, 40% of municipal waste generation in 2004 is comprised of commercial waste and 34% is comprised of recycled waste. It is clear therefore that many countries do not define municipal waste generation as broadly as in Ireland. The 2002 EU Waste Statistics Regulation is intended to harmonise EU-wide reporting on waste and it is anticipated that comparable results for 2004, from across the EU, will be available in 2006/7. It is interesting to note that the point of comparison for the Waste Statistics Regulation is household waste generation and this acknowledges the common experience that municipal waste data is not, in fact, comparable.

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<sup>15</sup> Notified in accordance with the TFS Regulation – Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community (OJ L30, 6.2.1993, p. 1), as amended; as implemented in Ireland by the Waste Management (Transfrontier Shipment of Waste) Regulations, 1998 (S.I. No. 149 of 1998).

<sup>16</sup> *The European Environment: State and Outlook 2005*. EEA, 2005.

### 3.1.1 Disposal and recovery of municipal waste

The trends in municipal waste management are positive: landfill is decreasing and recovery is increasing. While the actual quantity of municipal waste landfilled has decreased by 0.8% since 2003, the actual quantity of material recycled has increased by 26.5% in the same period. This has a positive effect on the municipal waste recovery rate. The disposal and recovery rates for the various materials in the municipal waste stream are shown in Table 3. Combined, this results in an overall increase in municipal waste recovery from 28.4% in 2003 to 33.6% in 2004. The quantity of municipal waste recovered is calculated through direct reporting from recycling organisations. Some 65% of the total quantity recycled in 2004 was verified by the EPA through site visits at 18 such organisations.

In 2004 for the first time, a notable amount of municipal waste (25,747 tonnes) underwent energy recovery operations in Germany. This practice ceased in 2005 as a result of Germany's implementation of the Landfill Directive<sup>17</sup>. Energy recovery is not classified as recycling – therefore, the quantity of municipal waste recycled in 2004 was 893,248 tonnes, a recycling rate of 32.6%<sup>18</sup>. With a national target of 35% municipal waste recycling by 2013, Ireland is well on the way to achieving this. However, there is no room for complacency – continued efforts should be made by local authorities and the Market Development Group<sup>19</sup> to drive recycling and create new markets for recycled products.

**Table 3 Disposal and recovery of municipal waste, 2004**

Material	Quantity managed (tonnes)	Quantity landfilled (tonnes)	National landfill rate (%)	Quantity recovered (tonnes)	National recovery rate (%)
Wood	175,330	14,180	8.1	161,150	91.9
Ferrous	70,712	24,449	34.6	46,263	65.4
Glass	123,446	54,642	44.3	68,804	55.7
Paper and cardboard	821,903	446,306	54.3	375,597	45.7
WEEE	21,392	11,856	55.4	9,536	44.6
Plastic	295,890	239,986	81.1	55,904	18.9
Other metals	13,827	12,229	88.4	1,597	11.6
Organics	750,580	667,075	88.9	83,505	11.1
Aluminium	22,854	20,378	89.2	2,476	10.8
Textiles	157,521	146,986	93.3	10,535	6.7
Others <sup>20</sup>	284,059	180,432	63.5	103,627	36.5
<b>Total</b>	<b>2,737,531</b>	<b>1,818,536</b>	<b>66.4</b>	<b>918,995<sup>21</sup></b>	<b>33.6</b>

(Source: recycling organisations survey, local authority survey, landfill annual environmental reports and EPA municipal waste composition survey)

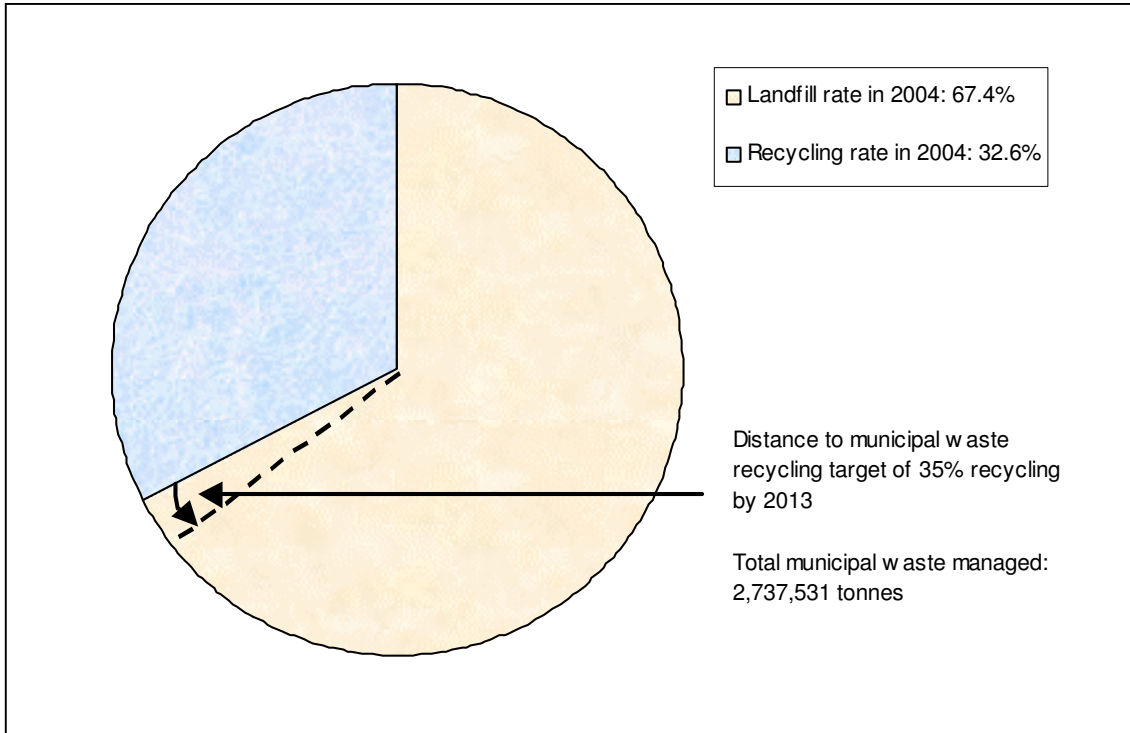
<sup>17</sup> This had the effect of reducing incineration capacity in Germany as there were greater restrictions on waste acceptance at landfill. This in turn drove up incineration gate fees.

<sup>18</sup> “Recovery” includes recycling and energy recovery. As the target for municipal waste relates to “recycling” and not “recovery”, it is necessary to exclude the quantity undergoing energy recovery to properly determine progress towards achieving the municipal waste recycling target. 893,248 tonnes of municipal waste was recycled in 2004, and 25,747 tonnes of waste was burned for energy recovery – a total of 918,995 tonnes.

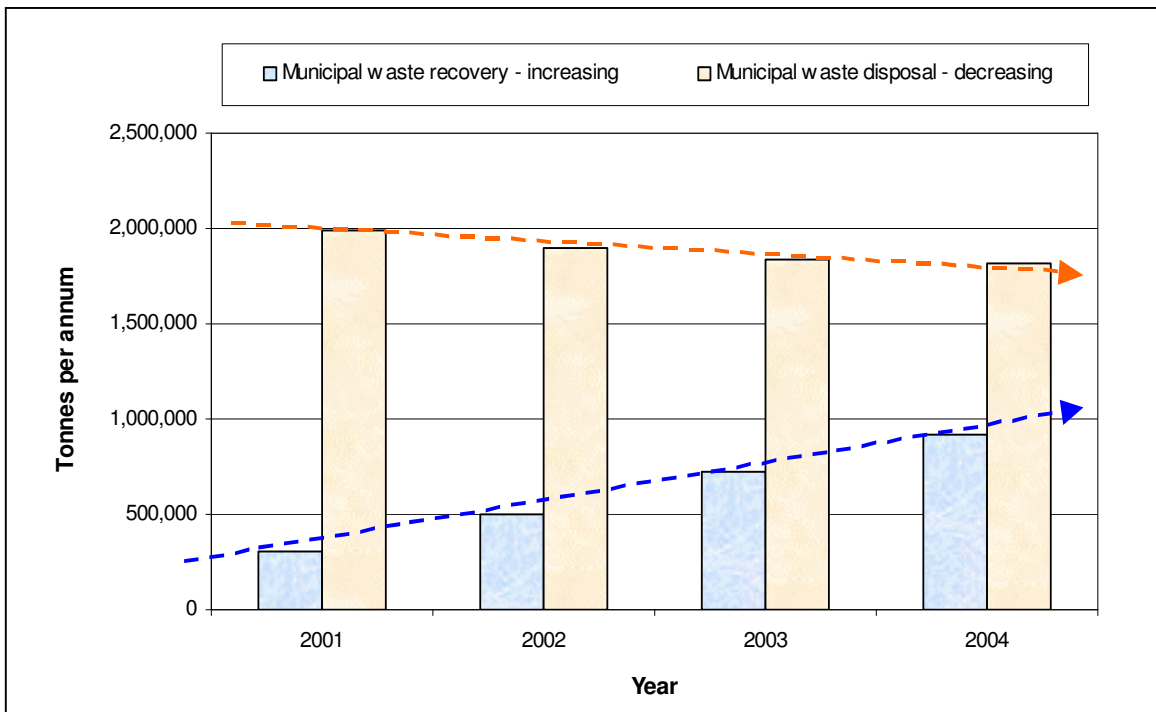
<sup>19</sup> More information is available from [www.envirocentre.ie](http://www.envirocentre.ie).

<sup>20</sup> Includes cooking oil, mineral oil, batteries, composite packaging, tyres and 70,139 tonnes of residues from mechanical treatment of mixed municipal waste shipped to Germany and Northern Ireland for recovery and recycling respectively.

<sup>21</sup> Of the 918,995 tonnes recovered, 893,248 tonnes was recycled and 25,747 tonnes underwent energy recovery.



**Figure 3** Recycling of municipal waste, 2004



**Figure 4** Recovery and disposal of municipal waste are moving in the right directions

There is a strong dependence on recycling infrastructure abroad for processing recyclable waste streams generated in Ireland (with the exception of wood) and this dependence has grown in recent years. The quantity of recyclable materials exported in 2004 is detailed in Table 4. Since the closure of old processing facilities for glass steel and paper<sup>22</sup>, a large quantity of these materials is exported for reprocessing. In 2004, a total of 480,802 tonnes of metals was exported for reprocessing predominantly to Spain (72.4%) and the UK (22%). The UK was the principal destination for paper reprocessing, accounting for 41% of the total, while a significant quantity, accounting for 23%, was exported to Asia. The work of the Market Development Group should be actively supported, from a financial and human resource point of view and progress should be measured by new and increased recycling of waste in Ireland. However, it should be noted that clean, segregated recyclable materials are a sought-after resource which are traded freely under EU law.

An additional 70,139 tonnes of pre-treated mixed municipal waste was exported in 2004, including 33,887 tonnes exported to Germany for recycling (8,140 tonnes) and energy recovery (25,747 tonnes) and 36,252 tonnes of organic fines from municipal waste pre-treatment shipped to Northern Ireland for composting and subsequent use as landfill cover.

**Table 4 Destination of recyclable waste streams exported in 2004**

	Paper and cardboard	Glass	Plastic	Metals	Wood	WEEE	Other <sup>23</sup>	Total
<b>Spain</b>	42,792	0	0	348,043	0	4,180	0	<b>395,015</b>
<b>UK</b>	105,623	65,597	30,606	106,069	13,109	3,166	14,403	<b>338,573</b>
<b>Holland</b>	42,242	83	317	3,377	0	135	434	<b>46,588</b>
<b>Germany</b>	6,741	0	4,283	1,535	133	1,540	1,557	<b>15,789</b>
<b>Belgium</b>	0	0	0	15,258	0	3	1	<b>15,262</b>
<b>Italy</b>	0	0	20	4,000	0	0	0	<b>4,020</b>
<b>Europe</b>	0	0	1,961	0	0	0	0	<b>1,961</b>
<b>Eastern Europe</b>	0	0	0	0	0	12	1,350	<b>1,362</b>
<b>France</b>	0	0	0	235	0	13	0	<b>248</b>
<b>Denmark</b>	0	0	0	0	0	17	119	<b>136</b>
<b>Sub-total Europe</b>	<i>197,398</i>	<i>65,680</i>	<i>37,187</i>	<i>478,517</i>	<i>13,242</i>	<i>9,066</i>	<i>17,864</i>	<b>818,954</b>
<b>China</b>	18,358	0	7,100	2,286	0	159	0	<b>27,903</b>
<b>India</b>	98	0	0	0	0	0	0	<b>98</b>
<b>Pakistan</b>	44	0	74	0	0	0	0	<b>118</b>
<b>Asia</b>	41,342	0	2,826	0	0	0	0	<b>44,168</b>
<b>Sub-total Asia</b>	<i>59,842</i>	<i>0</i>	<i>10,000</i>	<i>2,286</i>	<i>0</i>	<i>159</i>	<i>0</i>	<b>72,287</b>
<b>TOTAL</b>	<b>257,240</b>	<b>65,680</b>	<b>47,186</b>	<b>480,803</b>	<b>13,242</b>	<b>9,225</b>	<b>17,864</b>	<b>891,240</b>

(Source: recycling organisations survey)

<sup>22</sup> One paper mill was in operation in the Republic of Ireland until its closure in early 2005.

<sup>23</sup> Includes: textiles; batteries; composites; waste oil; cooking oil; and tyres.

## 3.2 Household waste

### 3.2.1 Source, nature and quantity

As indicated in Table 2, 1,737,416 tonnes of household waste was generated in Ireland in 2004, an increase of less than 2% from 2003. This includes:

- ❑ household waste recovered;
- ❑ household waste landfilled;
- ❑ uncollected household waste; and
- ❑ exported household waste not otherwise accounted for.

In the last few years, we have witnessed a sea change in the management of household waste. Most householders with a waste collection service are now provided with separate collection of dry recyclables and, in some cases, household organic waste. While many separate collection schemes were in place in 2004, it is expected that the full extent of the impact of these changes will not be evident until the 2005 report is compiled. The average generation of household waste per capita has increased to 430kg/capita<sup>24</sup>, from 428kg/capita in 2003<sup>25</sup>.



**Many householders are now provided with a kerbside collection service for mixed dry recyclables, diverting household waste away from landfill**

<sup>24</sup> Based on CSO population data for April 2004 of 4,043,800.

<sup>25</sup> Based on revised household waste generation quantity as per Table 2 and CSO population data for April 2003 of 3,978,900.

### 3.2.2 *Uncollected household waste*

Each local authority is obliged to collect, or provide for the collection of, household waste in accordance with Section 33 of the Waste Management Acts 1996 to 2005. The following exemptions apply whereby a local authority need not provide a collection service in certain areas if:

- an adequate waste collection service is available, for example by the private sector;
- the cost of providing a waste collection service by the local authority would, in the opinion of the authority, be unreasonably high; or
- the local authority is satisfied that adequate alternative arrangements can reasonably be made by the householder.

In many local authority areas, household waste collection services are provided wholly by the private sector. Some local authorities continue to provide collection services in their areas<sup>26</sup>. However, in most local authority areas, there is a proportion of households that is not provided with, or chooses not to avail of, waste collection services. Some reasons for this include:

- in some cases, householders may choose to share bins with a neighbour or other family members;
- some dwellings are located too far away from the route of the collection service on offer in the area;
- householders may avail of nearby bring banks and civic waste facilities for recyclable materials;
- some householders have direct access to, or the use of, a local landfill facility; or
- householders are engaged in illegal practices such as backyard burning or fly-tipping.

Each local authority was requested to provide an estimate of uncollected<sup>27</sup>, or otherwise unaccounted for, household waste in 2004. A standard methodology for estimating this quantity was provided by the EPA, allowing local authorities to take local conditions into account. All local authorities used the recommended methodology, hence the estimate is consistent across the country. The national estimate of “uncollected” household waste is 227,374 tonnes, a decrease of more than 60,000 tonnes since 2003. The 2004 estimate is considered to be more robust as it was given more systematic consideration by local authorities. Local authorities also reported the clean-up of 11,192 tonnes of fly-tipped waste, accounting for 5% of “uncollected” household waste. Some of the uncollected household waste is undoubtedly subjected to backyard burning and the EPA’s Office of Environmental Enforcement recently reported<sup>28</sup> that 80% of local authorities claim to have a problem with backyard burning of waste in their functional area.

According to information provided by local authorities, the national average for provision of household waste collection service is 77%. It is recommended that local authorities take active steps to establish which of the above listed exemptions apply in relation to the 23% of households that are not provided

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<sup>26</sup> Local authority collection: 474,041 tonnes mixed residual waste and separate collection of mixed dry recyclables; Private collection: 540,112 tonnes mixed residual waste and separate collection of mixed dry recyclables.

<sup>27</sup> “Uncollected waste” refers to the waste produced by the portion of the population not provided with a collection service, corrected to take account of local conditions such as shared bins, direct access to landfills etc.

<sup>28</sup> EPA, 2005, *The Nature and Extent of Unauthorised Waste Activity in Ireland*.

with, or choose not to avail of, collection services. In some areas, actions are being taken to address problems such as backyard burning, for example through awareness campaigns, more proactive enforcement initiatives and litter hotlines.

### 3.2.3 Household waste composition

A programme of municipal waste composition surveys was commissioned by the EPA in 2004 under the National Waste Prevention Programme. The surveys provide an up to date estimation of waste composition factors for household waste, taking into account the various combinations of collection systems now available to householders<sup>29</sup>. The composition of mixed residual household waste, as determined during the surveys undertaken in late 2004 and early 2005, is illustrated in Table 5 and Figure 5. The composition of this waste stream has changed considerably since the last update in the *National Waste Database Report 2001*. This is due mainly to the change in collection systems for household waste, diverting recyclable household waste streams away from landfill. For example, the proportion of paper, glass and metal in mixed residual household waste (typically destined for landfill) has decreased due to the successful diversion of these materials to recycling schemes. Other material such as plastic, organics and textiles show increased proportions landfilled in 2004. Separate kerbside collection of organic waste is a growing but not well-established operation so its proportion inevitably increases as other materials are taken out. The continued presence of plastic in the national household waste-to-landfill profile is likely to be due to the exclusion of plastic from Dublin's kerbside recycling scheme.

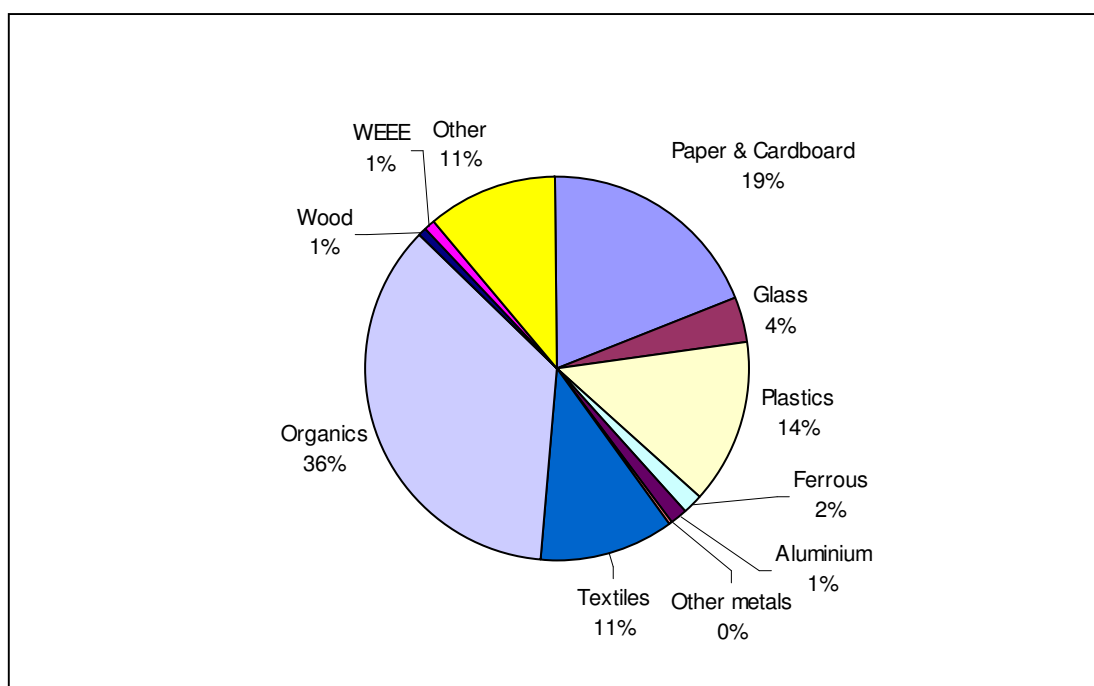
**Table 5**                      **Composition of mixed residual household waste, 2004**

	<b>Non-Packaging (%)</b>	<b>Packaging (%)</b>	<b>Total (%)</b>
Organics	36.2		<b>36.2</b>
Paper & cardboard	13.5	5.7	<b>19.2</b>
Plastics	2.8	11.0	<b>13.8</b>
Textiles	11.0	0	<b>11.0</b>
Glass	0.1	3.6	<b>3.7</b>
Ferrous	0.3	1.3	<b>1.5</b>
Aluminium	0.8	0.6	<b>1.4</b>
Wood	0.9	0	<b>0.9</b>
WEEE	0.8		<b>0.8</b>
Other metals	0.4	0	<b>0.4</b>
Other	9.4	1.7	<b>11.1</b>
<b>Total</b>	<b>76</b>	<b>24</b>	<b>100</b>

(Source: EPA municipal waste composition survey)

<sup>29</sup> Kerbside collection of dry recyclables and organics; pay-by-use for mixed residual waste collection; improved availability of bring facilities.





**Figure 5** Composition of the mixed residual household waste stream, 2004

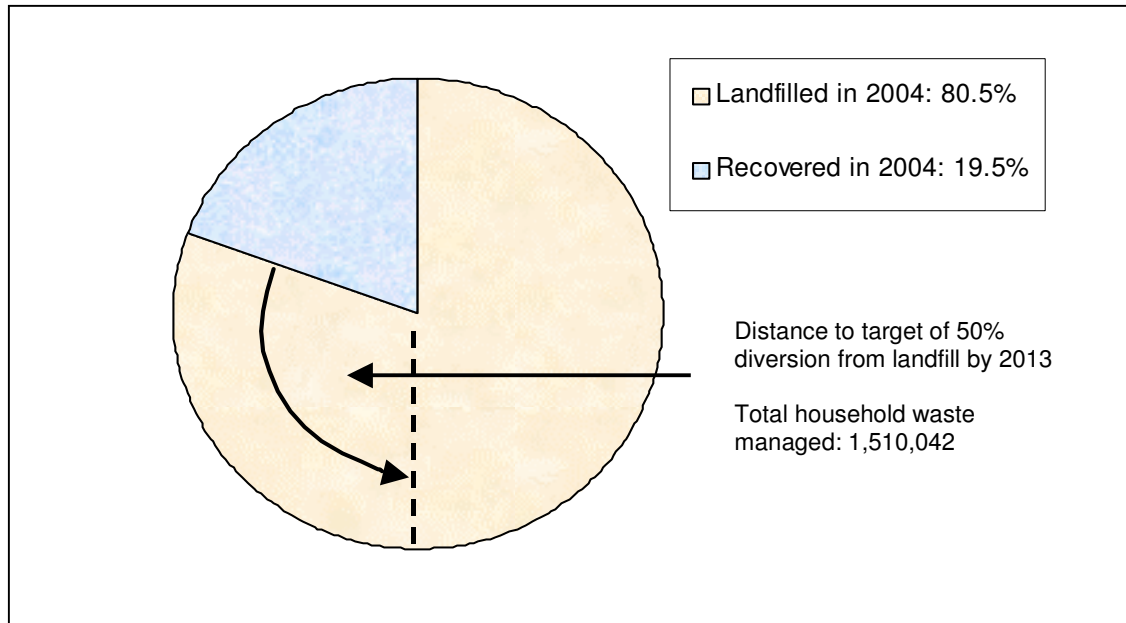
### 3.2.4 Disposal and recovery of household waste

The actual quantity of household waste recovered has continued to increase in the last few years, with an increase of 58.9% (over 109,000 tonnes) between 2003 and 2004. The recovery rate was 19.5% in 2004. For the third year running, there has been a further decrease in the reported quantity of household waste landfilled, from 1,231,109 tonnes in 2003 to 1,214,908 tonnes in 2004. While the trend continues to move in the right direction, there is still some distance to go to meet the national target of 50% diversion of household waste from landfill by 2013, as illustrated in Figure 6. The disposal and recovery rates for the various materials in the household waste stream are shown in Table 6.

**Table 6** Disposal and recovery rates in the household waste stream, 2004

Material	Quantity managed (tonnes)	Quantity landfilled (tonnes)	National landfill rate (%)	Quantity recovered (tonnes)	National recovery rate (%)
Glass	111,693	45,313	40.6	66,381	59.4
WEEE	14,688	9,179	62.5	5,510	37.5
Paper and cardboard	353,746	233,446	66.0	120,300	34.0
Wood	16,661	11,152	66.9	5,508	33.1
Ferrous	22,881	18,557	81.1	4,324	18.9
Plastic	187,131	167,261	89.4	19,871	10.6
Aluminium	18,186	16,795	92.3	1,392	7.7
Organics	470,136	440,131	93.6	30,005	6.4
Textiles	137,830	133,310	96.7	4,520	3.3
Other metals	5,006	4,849	96.9	157	3.1
Others	172,083	134,916	78.4	37,167	21.6
<b>Total</b>	<b>1,510,042</b>	<b>1,214,908</b>	<b>80.5</b>	<b>295,134</b>	<b>19.5</b>

(Source: recycling organisations survey, local authority survey, landfill annual environmental reports and EPA municipal waste composition survey)



**Figure 6** Diversion of household waste from landfill, 2004

### 3.3 Commercial waste

#### 3.3.1 Source, nature and quantity

As shown in Table 2, an estimated 1,227,489 tonnes of commercial waste was generated in Ireland in 2004, an increase of 7.6% from 2003. This includes:

- ❑ commercial waste recovered;
- ❑ commercial waste landfilled; and
- ❑ exported commercial waste not otherwise accounted for.

#### 3.3.2 Commercial waste composition

A programme of municipal waste composition surveys commissioned by the EPA in 2004, as outlined in section 3.2.3, has provided new waste composition factors for commercial waste. Week-long surveys took place at the premises of eight commercial enterprises in late 2004 and early 2005. The average composition of mixed residual commercial waste, based on the sample surveys, is illustrated in Table 7 and Figure 7. The surveys accurately document the actual waste generation and management practices at the premises surveyed. The calculation methodology assumes that the sample enterprises are representative of the relevant sector as a whole.

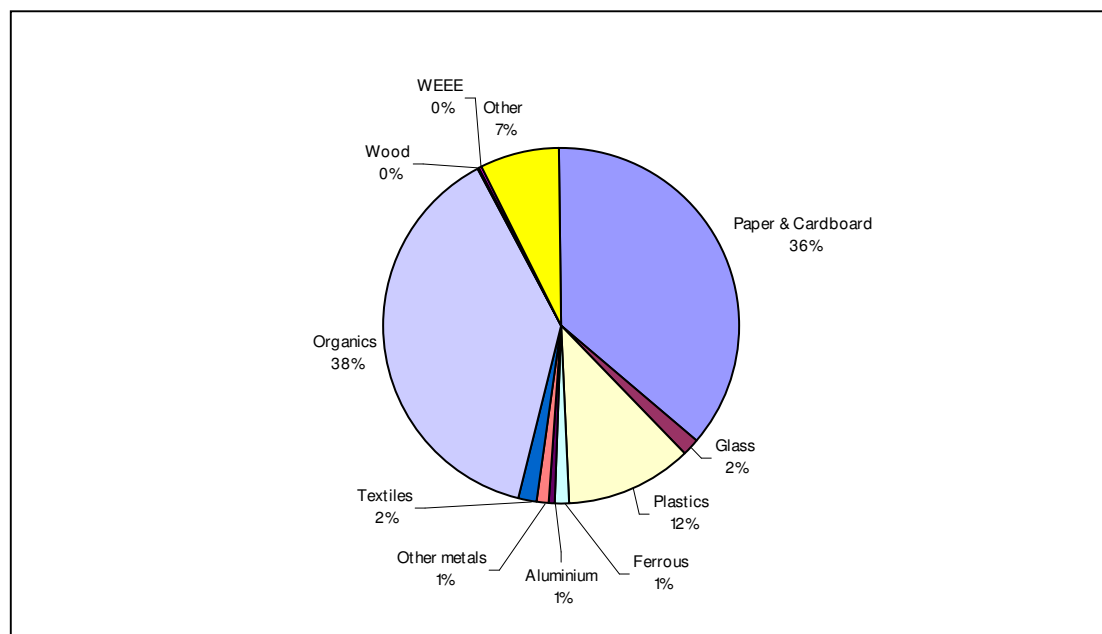
The composition of commercial waste sent for disposal has changed considerably since the last update of composition factors used for the *National Waste Database 2001*. Some of this change is likely to be

attributed to packaging legislation<sup>30</sup>, placing an obligation on producers to take practicable steps to present packaging waste for recovery, and the later introduction of an effective disposal ban on specified packaging materials<sup>31</sup> in legislation<sup>32</sup> introduced in 2003.

**Table 7** Composition of mixed residual commercial waste, 2004

	Non-Packaging (%)	Packaging (%)	Total (%)
Organics	38.4		38.4
Paper & cardboard	32.3	3.7	36.0
Plastics	2.5	9.0	11.5
Glass	0.0	1.6	1.6
Textiles	1.6	0	1.6
Other metals	0.9	0.3	1.3
Ferrous	0.1	0.8	1.0
Aluminium	0	0.6	0.6
Wood	0.1	0.3	0.4
WEEE	0.3		0.3
Other	6.2	0.9	7.1
<b>Total</b>	<b>82.6</b>	<b>17.4</b>	<b>100</b>

(Source: EPA municipal waste composition survey)



**Figure 7** Composition of the mixed residual commercial waste stream, 2004

<sup>30</sup> Waste Management (Packaging) Regulations, 1997. (S. I. No. 242 of 1997) as amended by Waste Management (Packaging) Regulations, 1998. (S. I. No. 382 of 1998).

<sup>31</sup> Aluminium; fibreboard; glass; paper; plastic sheeting; steel; and wood.

<sup>32</sup> Waste Management (Packaging) Regulations, 2003. (S. I. No. 61 of 2003).

### 3.3.3 Disposal and recovery of commercial waste

The disposal and recovery rate for various materials in the commercial waste stream are shown in Table 8. The overall recovery rate has increased from 47.4% in 2003 to 50.8% in 2004. While the recovery rate has marginally increased, the actual quantity of commercial waste recovered increased by over 15.3% and disposal decreased by 0.35%. While there are no specific targets for commercial waste, its recovery will significantly contribute to meeting the target of 35% recycling of municipal waste by 2013.

**Table 8 Disposal and recovery in the commercial waste stream, 2004**

Material	Quantity managed (tonnes)	Quantity landfilled <sup>33</sup> (tonnes)	National landfill rate (%)	Quantity recovered (tonnes)	National recovery rate (%)
Wood	158,669	3,027	1.9	155,642	98.1
Ferrous	47,831	5,892	12.3	41,939	87.7
WEEE	6,704	2,677	39.9	4,027	60.1
Paper and cardboard	468,157	212,860	45.5	255,297	55
Plastic	108,759	72,725	66.9	36,034	33.1
Textiles	19,691	13,676	69.5	6,016	30.5
Aluminium	4,668	3,584	76.8	1,084	23.2
Glass	11,753	9,330	79.4	2,423	20.6
Organics	280,444	226,944	80.9	53,500	19.1
Other metals	8,821	7,381	83.7	1,440	16.3
Others	111,976	45,516	40.6	66,460	59.4
<b>Total</b>	<b>1,227,489</b>	<b>603,628</b>	<b>49.2</b>	<b>623,862</b>	<b>50.8</b>

(Source: recycling organisations survey, local authority survey, landfill annual environmental reports and municipal waste composition survey)



**Cardboard off-cuts sorted for collection and recycling**

<sup>33</sup> Includes 561,079 tonnes commercial waste landfilled and 42,549 tonnes non-process industrial waste landfilled.

## 3.4 Conclusions and recommendations

### 3.4.1 Conclusions

#### *Municipal waste generally*

- C3 Municipal waste generation increased by 4% between 2003 and 2004.
- C4 The recovery of municipal waste increased from 28.4% in 2003 to 33.6% in 2004. This represents an increase of 26.5%, equivalent to 192,232 tonnes.
- C5 Most municipal waste recovery is attributed to recycling, with 2.8% attributed to energy recovery.
- C6 Municipal waste recycling stands at 32.6%, indicating that the 2013 national target of 35% recycling is almost achieved.
- C7 Ireland continues to be dependent on foreign materials-recycling infrastructure, particularly for the recycling of glass, metals and paper and cardboard.
- C8 The principal destinations for recyclable waste exported in 2004 were Spain (metal), the UK (all materials) and Holland (paper and cardboard).
- C9 Some 72,294 tonnes of recyclable materials was exported for reprocessing outside Europe.
- C10 An additional 70,139 tonnes of pre-treated mixed municipal waste, derived from waste treatment operations, was exported for reuse as fuel at incineration and industrial facilities in Germany and composting in Northern Ireland in 2004.

#### *Household waste*

- C11 There was a 2% increase in household waste generation in 2004, compared to 2003. A new calculation methodology was used, providing an estimate of household waste generation in 2004 of 1,737,416 tonnes.
- C12 The trends in household waste management are moving in the right direction, away from disposal, towards recovery: the quantity of household waste recovered increased by a remarkable 59%, while disposal decreased by 1.3%.
- C13 The composition of household waste presented for disposal is also changing: kerbside collection services for mixed dry recyclables are successfully diverting household waste from landfill.
- C14 The proportion of organic waste and plastic has increased in residual household waste. Dublin's kerbside recycling scheme does not accept plastic (though this exclusion is expected to cease in the near future). Most kerbside recycling schemes do not accept organic waste, though this service is being gradually introduced by more and more local authorities.

- C15 “Uncollected”, or otherwise unaccounted for, household waste was estimated at 227,374 tonnes. This represents the household waste estimated to be generated at the 23% of households that do not have access to, or choose not to avail of, waste collection services.

*Commercial waste*

- C16 The generation of commercial waste increased by 7.6% in 2004 - from 1,141,264 tonnes in 2003 to 1,227,489 tonnes in 2004.
- C17 The commercial waste recovery rate increased from 47.1% in 2003 to 50.8% in 2004, a quantitative increase of 82,852 tonnes.
- C18 The success of commercial waste recycling is reflected in the absence of certain materials, paper and cardboard in particular, in waste bins at commercial premises. On the other hand, the relative proportion of organic waste in landfilled commercial waste has increased, reflecting the lack of attention paid to recycling organic waste while other recyclables, particularly packaging from enterprises, has received significant attention.

### 3.4.2 Recommendations

*Municipal waste, including household waste and commercial waste*

- R3 The recycling of municipal waste has almost reached the national target of 35% recycling by 2013. Consideration should be given to whether this target should be increased to further drive recycling efforts.
- R4 The export of recyclable waste materials (paper, glass, metal, etc.) is a trade that cannot be inhibited by Member States. However, the creation of an indigenous recycling industry, where technically and economically feasible, has merits including job creation, industrial development and a supply of recycled materials for use in, for example, manufacturing and construction. The work of the Market Development Group should be actively supported and personnel appointed to carry out this initiative. Its success should be measured by new and increased recycling of waste in Ireland.
- R5 Separate collection of plastic waste should be made available in all areas (to householders and business) to ensure that this material is diverted from landfill.
- R6 Local authorities should investigate, via detailed on-the-ground surveys, what happens to the waste generated by those householders that have no collection service and, in particular, those that choose not to avail of collection services. Local authorities should document their reasons, as provided for in section 33 of the Waste Management Acts, 1996 to 2005, for not providing a collection service in unserved areas.

- R7 The collection of household waste is increasingly controlled by the private sector. The recommendation of the Competition Authority that tendering procedures be used by local authorities would go some way towards ensuring that local authorities meet their legal obligation to provide collection services in an economical and efficient manner. The recommendation should be actively considered in the short term.
- R8 Communications campaigns such as Race Against Waste should continue in order to maintain and increase householder awareness of waste matters.
- R9 Local authorities should tackle the waste information gap by developing audit programmes to verify the data provided by collection permit- and waste permit-holders to ensure that reported collection and management of household and commercial waste is accurate. The need for credible and verified information is growing and greater resources should be allocated to this task. Due to the cross-boundary nature of many waste operators, audit programmes on a regional and national basis may be appropriate.





## 4. BIODEGRADABLE MUNICIPAL WASTE

### 4.1.1 Source, nature and quantity

Biodegradable municipal waste is waste that can undergo biological decomposition. It is typically composed of food and garden waste (grass clippings, prunings etc.), paper, cardboard, wood and textiles. Approximately 74% of household and commercial waste generated in Ireland in 2004 is biodegradable. This compares to 65% in previous years. The change is due to the new composition factors, which reflect the removal of many recyclables from the residual waste stream, with the exception of organic waste. The largest fraction of biodegradable municipal waste is paper and cardboard (42.5%), followed by organic waste (food and garden waste) at 40.3%.

### 4.1.2 Disposal and recovery of biodegradable municipal waste

As shown in Table 9, it was estimated that 1,935,214 tonnes of biodegradable municipal waste was generated in Ireland in 2004 of which 67.4% was landfilled and the remaining 32.6% recycled.

**Table 9 Biodegradable municipal waste generation and management, 2004**

Material	Quantity managed (tonnes)	Quantity landfilled (tonnes)	Quantity recovered (tonnes)	National recovery rate (%)
Wood	175,330	14,180	161,150	91.9
Paper and cardboard	821,903	446,306	375,597	45.7
Organics	780,460	696,955 <sup>34</sup>	83,505	10.7
Textiles	157,521	146,986	10,535	6.7
<b>Total</b>	<b>1,935,214</b>	<b>1,304,426</b>	<b>630,788</b>	<b>32.6</b>

(Source: recycling organisations survey, local authority survey, landfill annual environmental reports and EPA municipal waste composition survey)

Progressive targets have been set out in the Landfill Directive<sup>35</sup> to reduce the proportion of biodegradable municipal waste landfilled. By 2006 Member States are restricted to landfilling a maximum of 75% of the total weight of biodegradable municipal waste generated in 1995, the baseline year. This target is further reduced to 50% of the 1995 baseline by 2009 and 35% by 2016, as indicated in Table 10. In 2004, the amount of biodegradable municipal waste landfilled was 101% of the 1995 baseline - there is a long way to go to reverse this trend and meet the Landfill Directive targets. Following extensive consultation, a *National Strategy for Biodegradable Waste*<sup>36</sup> is about to be

<sup>34</sup> Includes 29,880 tonnes of organic contaminants from non-biodegradable packaging waste (glass, plastic and ferrous metals) landfilled, added to the quantity of organic waste reported in Table 3 (667,075 tonnes). Refer also to footnote <sup>46</sup>.

<sup>35</sup> Council Directive 1999/31/EC on the landfill of waste.

<sup>36</sup> A draft strategy was published in April 2004 and was subject to public consultation. More information is available on [www.environ.ie](http://www.environ.ie).

published by the Department of the Environment, Heritage and Local Government and will propose measures to progressively divert biodegradable municipal waste from landfill.

**Table 10 Biodegradable municipal waste diversion-from-landfill targets**

<b>Baseline</b>		
		<b>Quantity generated (tonnes)</b>
1995		1,289,911
<b>Targets</b>		
<b>Target Year<sup>37</sup></b>	<b>Landfill Directive Target</b>	<b>Maximum quantity allowed to be landfilled (tonnes)</b>
2006	75% of quantity generated in 1995	967,433
2009	50% of quantity generated in 1995	644,956
2016	35% of quantity generated in 1995	451,469
<b>Current position</b>		
		<b>Quantity landfilled (tonnes)</b>
2004		1,304,426

(Source: local authority survey, landfill annual environmental reports and municipal waste composition survey)

To accompany the now well-established practice of separate collection of mixed dry recyclables, twelve local authorities reported the collection of 20,078 tonnes of organic waste from households via kerbside schemes in 2004. An additional quantity of 41,447 tonnes of organics was separately collected via kerbside schemes from commercial sources<sup>38</sup>. As the roll-out of kerbside schemes progresses, we are bound to see increased collection of this material. A total of 21,980 tonnes of organic waste was collected through bring facilities.

### 4.1.3 Conclusions

- C19 The proportion of biodegradable municipal waste in residual waste bins has increased as a result of the removal of other recyclable fractions from municipal waste.

### 4.1.4 Recommendations

- R10 The forthcoming *National Strategy for Biodegradable Waste* should be published and implemented without delay and allocated sufficient resources for immediate implementation and enforcement.
- R11 Within the framework of the *National Strategy*, measures should be put in place to separately collect and treat organic waste from households, restaurants, hotels, etc.,

<sup>37</sup> The Landfill Directive (1999/31/EC) allows Ireland to avail of a derogation under Article 5 of the Directive. This would have the effect of postponing each target for 4 years.

<sup>38</sup> Table 3 indicates a total of 83,505 tonnes of organic municipal waste separately collected and includes quantities collected via kerbside (61,525 tonnes) and bring systems (21,980 tonnes).

and thereby divert this material from landfill. This waste stream should be prioritised by local authorities if Ireland is to reach the targets for landfill diversion laid down in the Landfill Directive (1999/31/EC).

- R12 Local authorities should continue to promote home composting as a means of diverting household organic waste from landfill.



## 5. PACKAGING WASTE

### 5.1.1 Source, nature and quantity

All consumers of packaged goods generate packaging waste. Packaging<sup>39</sup> waste may include such materials as cardboard, paper, glass, plastic, steel, aluminium and wood, in addition to composite materials<sup>40</sup> such as milk and juice cartons. An estimated 850,911 tonnes of packaging waste was generated in 2004. This represents 210kg of packaging waste per capita<sup>41</sup>, somewhat higher than the EU-15 average of 172kg/capita. According to the European Environment Agency<sup>42</sup> however, these figures are not directly comparable as Member States “have differing definitions of packaging and understanding of which types of packaging waste need to be reported.” Different EU Member States also use varying methodologies to estimate packaging waste generation and management, including estimates based on trade statistics, waste management statistics and/or a combination of both<sup>43</sup>. The Irish data is unique in being based wholly on waste management statistics through audited surveys of packaging waste recovery and disposal operators. This methodology gives a true picture of the packaging waste available for management. The EPA is currently conducting research to establish whether a methodology based on trade statistics is possible and appropriate in an Irish context in collaboration with Repak and the CSO.

### 5.1.2 Disposal and recovery of packaging waste

The packaging waste recovery rate was 56.4% in 2004, a year ahead of the EU target for 2005 of 50%. Table 11 provides details on packaging recovery by material type. The overall landfill of municipal waste continued to decrease in 2004 and the proportion of packaging in landfilled waste has also decreased, as measured in municipal waste composition surveys conducted in 2004 and 2005. Combined, this has resulted in a remarkable decrease of 37% in packaging waste disposal. This trend is expected to continue with the implementation and enforcement of new national regulations further reinforcing the segregation and separate collection of packaging waste.

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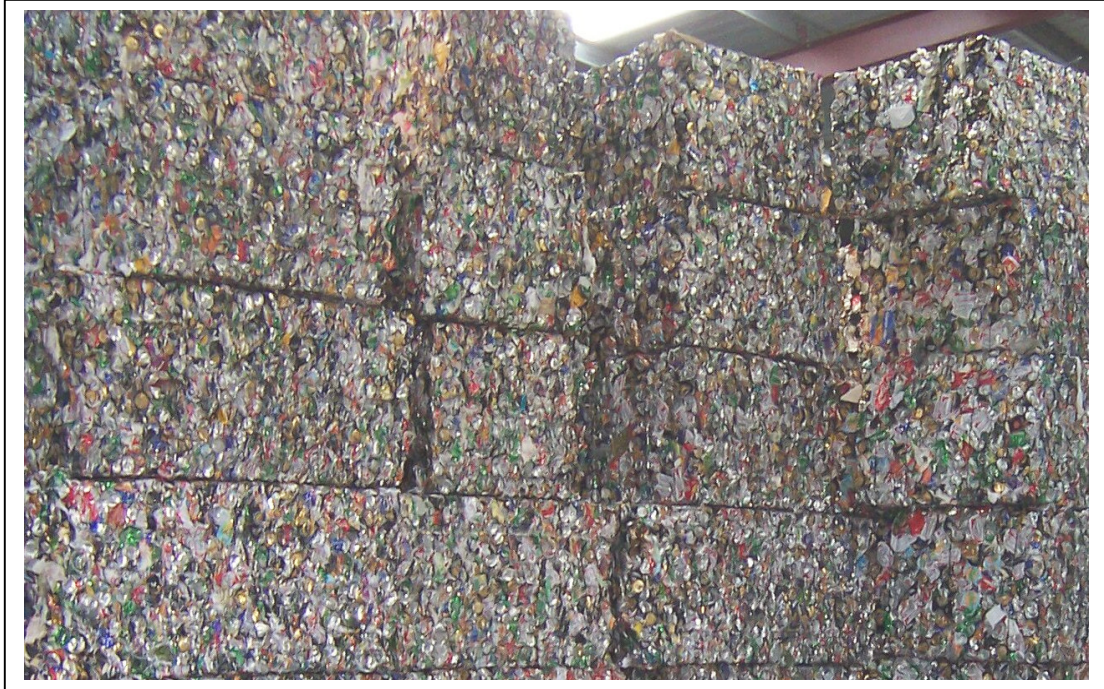
<sup>39</sup> Any material, container or wrapping used for or in connection with the containment, transport, handling, protection, promotion, marketing or sale of any product or substance, as defined in the Waste Management Acts 1996 to 2005.

<sup>40</sup> Composite means packaging made of different materials which cannot be separated by hand, as defined in Commission Decision (97/138/EC) of 3 February 1997, establishing the formats relating to the database system pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste.

<sup>41</sup> This is a reduction on packaging waste generation per capita estimated in previous years – the revised packaging waste composition factors result in a reduction in packaging waste disposal. The calculation is based on CSO population data for April 2004 of 4,043,800.

<sup>42</sup> *The European Environment: State and Outlook 2005*. EEA 2005.

<sup>43</sup> *Effectiveness of Packaging Waste Management Systems in Selected Countries: an EEA Pilot Study*. EEA 2005



**Baled aluminium beverage cans ready for reprocessing**

The recovery of packaging waste increased by 14.3% in 2004, due to the increased availability of mixed dry recyclables collections from households and increased obligations on commercial premises to segregate and recycle packaging waste. The largest fraction by weight recycled is paper and cardboard, followed by wood and glass. Since March 2003, producers of packaging are obliged to segregate for recovery specified packaging waste materials at source, effectively banning the landfill of these materials<sup>44</sup>. This is reflected most dramatically in an increase in the recovery rate of paper and cardboard, from 41% in 2003 to 70% in 2004.

The quantity of packaging waste recovered is calculated through direct reporting from recycling organisations. Some 65% of the total quantity of all waste recycled in 2004, of which packaging waste is a subset, was verified by the EPA through site visits. The EPA also liaises with Repak on an ongoing basis to cross check reported recovery of packaging waste.

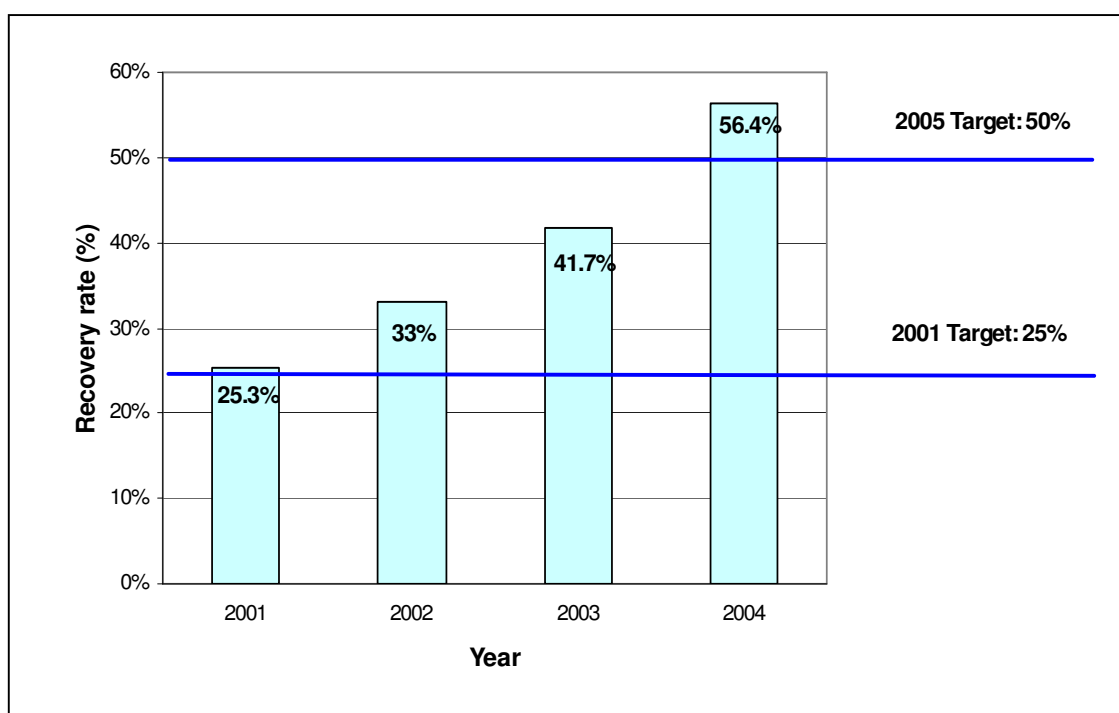
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<sup>44</sup> Waste Management (Packaging) Regulations, 2003 (S.I. No. 61 of 2003).

**Table 11 Packaging waste generation, disposal and recovery, 2004**

Material	Quantity managed (tonnes)	Quantity landfilled <sup>45</sup> (tonnes)	National landfill rate (%)	Quantity recovered (tonnes)	National recovery rate (%)
Wood	111,054	2,699	2.4	108,355	97.6
Paper and cardboard	310,641	93,258	30.0	217,383	70.0
Ferrous	56,620	17,237 <sup>46</sup>	30.4	39,383	69.6
Glass	116,911	52,532 <sup>46</sup>	44.9	64,379	55.1
Plastic	211,629	164,337 <sup>46</sup>	77.7	47,292	22.3
Other metals	2,446	2,082	85.1	364	14.9
Aluminium	12,479	11,088	88.8	1,392	11.2
Textiles	555	555	100.0	0	0.0
Others	28,575	27,584	96.5	992	3.5
<b>Total</b>	<b>850,911</b>	<b>371,371</b>	<b>43.6</b>	<b>479,540</b>	<b>56.4<sup>47</sup></b>

(Source: recycling organisations survey, local authority survey, landfill annual environmental reports and EPA municipal waste composition survey)

**Figure 8 Recovery of packaging waste, 2001-2004, and progress towards targets**

<sup>45</sup> Includes 11,921 tonnes non-process industrial packaging waste.

<sup>46</sup> 29,880 tonnes of organic contaminants of non-biodegradable packaging (glass, plastic and ferrous metals) has been excluded from those packaging materials landfilled. This 29,880 tonnes has been assigned to biodegradable municipal waste, as per Table 9. Refer to footnote <sup>34</sup>.

<sup>47</sup> Applying the now out-dated packaging waste composition factors used in previous reports would result in a recovery rate in 2004 of 45.1%.

### *5.1.3 Conclusions*

- C20 Some 56% of packaging waste was recovered in 2004, a year ahead of the 50% EU target for 2005.
- C21 The quantity of packaging waste landfilled has decreased by 37% and the quantity recovered has increased by 14.3% in 2004.
- C22 The paper and cardboard recovery rate in particular shows a remarkable increase from 41.2% in 2003 to 70% in 2004, a reflection of the effective ban on landfill of this and other materials.

### *5.1.4 Recommendations*

- R13 Packaging prevention should now be the focus, given the strong progress on recycling - packaging waste recycling is well established and is likely to be sustained by the efforts of Repak, recyclers and the enforcement authorities.



## 6. CONSTRUCTION AND DEMOLITION WASTE

### 6.1.1 *Source, nature and quantity*

The total quantity of construction and demolition waste collected in 2004, as reported by local authorities, is provisionally estimated at 11,167,599 tonnes. As with municipal waste, the methodology used to calculate construction and demolition waste collection was based on information provided by local authorities, based in turn on reports from waste collection permit holders. During six EPA audits of the data, as compiled by local authorities, it was found that the information management systems in use by local authorities were, though varied, mostly satisfactory. Up to 40% of the reported 2004 quantity of construction and demolition waste was verified by the EPA during those audits. It was clear however that local authorities carried out limited verification checks on the data as reported by authorised collectors. It was also clear that several local authorities had received limited reports from permitted facility operators. The one exception noted was Meath County Council, which commenced a verification programme in 2005.

The 11 million tonnes of construction and demolition waste reported as collected is based on reports from waste collection permit holders and during the audits, a number of weaknesses in the data were identified.

- Some local authorities compiled collection permit data on a paper-based system, making it difficult to audit and more likely that errors could occur;
- Only one local authority used the reported data as an enforcement tool and carried out its own audits to ensure accuracy;
- Some local authorities used the maximum permitted amount specified in collection permits and facility permits in their compilations, as no reports were available from the operators; and
- Most local authorities were unable to obtain reports from a proportion of collection permit holders and facility permit holders.

Local authorities reported the treatment of 7,673,972 tonnes of construction and demolition waste at permitted facilities. During the audits, it became clear that this figure was not wholly based on reports from permitted facilities. Instead, local authorities relied in part on collection permit reports to determine the fate of collected construction and demolition waste. This methodology can provide no more than the broadest indication of waste accepted at permitted facilities and produces an unreliable dataset.

As stated earlier in this report, the EPA is charged with the production of national statistics on waste generation and management. This information is used by many decision- and policy-makers and it is the EPA's responsibility to publish the most accurate and reliable information available. Section 6.1.2 below presents the best available information on recovery and disposal of construction and demolition waste in 2004. Having identified the weaknesses in the data and the absence of substantial verification checks by local authorities, a programme of auditing will be carried out by the EPA in early 2006 at the waste

operator level. A report will be published by mid-2006 allowing progress with regard to national recycling targets for construction and demolition waste to be accurately assessed.

Construction and demolition waste is a strategically important issue given the extent of planned transport and other infrastructure nationally. The findings in the Office of Environmental Enforcement's report<sup>48</sup> that illegally disposed of waste came predominantly from the construction and demolition sector is particularly relevant. It is clear from the OEE's recommendations that the sector itself and local authorities will need to monitor construction and demolition waste generation and management much more closely. From a waste data point of view, local authorities will be asked in future data reports to state the extent to which they have verified and audited the information submitted to them. Local authorities should, in turn, require reciprocal effort on the part of the construction and demolition industry to monitor and report on waste generation and management.

### 6.1.2 Recovery and disposal of construction and demolition waste

Table 12 illustrates the reported recovery and disposal of construction and demolition waste managed through the collection permit, waste permit and waste licence system. In 2004, more than 11 million tonnes of construction and demolition waste was reported as collected by authorised waste collection permit holders, while a total of 9,513,962 tonnes was reported to be recovered and disposed by waste licensees and permit holders. The resulting discrepancy (1,640,375 tonnes) highlights the need for further auditing to determine the actual fate of collected construction and demolition waste, where it is collected for recovery at permitted facilities. The recovery rate in 2004 is provisionally estimated at 85.2%.

**Table 12 Collection and management of construction and demolition waste, 2004**

<b>Collection<sup>49</sup> (tonnes)</b>	11,167,599	
<b>Management (tonnes)</b>		
	<b>Recovery</b>	<b>Disposal</b>
Recovery at EPA licensed landfills (cover landscaping and engineering purposes)	1,839,990	
Recovery at local authority-permitted sites	7,673,972 <sup>50</sup>	
Disposal at EPA licensed landfills		13,262
<b>Total</b>	<b>9,513,962</b>	<b>13,262</b>
<b>Recovery rate (provisional)</b>		
		<b>85.2%</b>

(Source: local authority collection permit data and permit data, landfill annual environmental reports)

<sup>48</sup> *The Nature and Extent of Unauthorised Waste Activity in Ireland* (EPA, 2005).

<sup>49</sup> As reported by local authorities from information obtained through waste collection permit reports.

<sup>50</sup> This figure is based on a combination of reports from facility permit holders and collection permit holders.

Construction and demolition waste includes fractions such as soil and stones, concrete and rubble, wood, glass, metal and plastic. The soil and stone fraction, comprising 76% of total construction and demolition waste collected, is the easiest to recover and most of the recovered quantity outlined in Table 12 can be attributed to this fraction. Table 13 and Table 14 illustrate the recovery rate for soil and stones (90.3%) and all other construction and demolition waste fractions (69%) respectively. It is clear that the recovery of the soil and stones fraction is the largest contributing factor to the overall construction and demolition waste recovery rate of 85.2%. While the recovery rate of the non-soil and stones fraction (wood, plastic, metal, glass, etc.) appears positive, the industry should focus on maintaining verifiable records of construction and demolition waste management, particularly given the extent of unauthorised disposal of such waste in the past.

**Table 13**            **Collection and management of construction and demolition waste, soil and stones, 2004**

<b>Collection of soil and stones<sup>51</sup> (tonnes)</b>		8,491,994
<b>Management (tonnes)</b>		
	<b>Recovery</b>	<b>Disposal</b>
Recovery at EPA licensed landfills (cover landscaping and engineering purposes)	1,485,044	
Recovery at local authority-permitted sites	6,183,885	
Disposal at EPA licensed landfills		100
<b>Total</b>	<b>7,668,929</b>	<b>100</b>
<b>Recovery rate</b>		<b>90.3%</b>

(Source: local authority collection permit data and permit data, landfill annual environmental reports)

<sup>51</sup> As reported by local authorities from information obtained through waste collection permit reports.

**Table 14** Collection and management of construction and demolition waste, excluding soil and stones, 2004

<b>Collection of other construction and demolition waste fractions (excluding soil and stones)<sup>51</sup> (tonnes)</b>		<b>2,675,605</b>
<b>Management (tonnes)</b>		
	<b>Recovery</b>	<b>Disposal</b>
Recovery at EPA licensed landfills (cover landscaping and engineering purposes)	354,946	
Recovery at local authority-permitted sites	1,490,087	
Disposal at EPA licensed landfills		13,162
<b>Total</b>	<b>1,845,033</b>	<b>13,162</b>
<b>Recovery rate</b>		
		<b>69%</b>

(Source: local authority collection permit data and permit data, landfill annual environmental reports)

There is a variety of outlets available for the recovery of construction and demolition waste fractions, as illustrated in Table 15.

**Table 15** Potential recovery outlets for construction and demolition waste streams

<b>Category of C&amp;D waste</b>	<b>Potential outlets for waste material</b>
Soil	Cover, landscaping and restoration material at landfills
Rubble/concrete	Substitute for road aggregate in sub-surface layers <sup>52</sup>
Old stone and brick	Architectural salvage
Wood	Wood chip for board manufacture and boiler fuel Garden mulch
Plastic	Granulation and manufacture into garden furniture, road cones and other plastic products
Glass	Substitute for road aggregate and general flat glass recycling
Metal	Metal recovery through metal merchants

### 6.1.1 Conclusions

- C23 The availability of information on construction and demolition waste management has improved since 2001 though considerable uncertainty remains as to the robustness of the data.

<sup>52</sup> A specification has been introduced by the National Roads Authority. For further information, refer to the NRA website [www.nra.ie](http://www.nra.ie).

- C24 The remarkable increase in the generation of construction and demolition waste since 2001 is likely to be due to two main contributing factors: increased infrastructure and housing development and improved and more comprehensive reporting.
- C25 The recovery rate in 2004 is provisionally estimated at 85.2%.
- C26 Many construction and demolition waste materials are high value and are easily recycled for example, wood, metal, soil, rubble etc.

### *6.1.2 Recommendations*

- R14 Local authorities should utilise collection permit reports as both an enforcement and statistical tool to accurately monitor and track the movement of construction and demolition waste.
- R15 The National Construction and Demolition Waste Council should continue to promote prevention, minimisation and recovery options with the various industry players.
- R16 The construction and demolition industry should maintain accurate records so that progress towards the national targets can be properly assessed. The responsibility for maintaining and reporting waste records should shift from the waste industry to the construction and demolition industry itself. Consideration should be given to making the maintenance and reporting of waste data mandatory for all construction and demolition operations over a certain size.



## 7. INDUSTRIAL WASTE

### 7.1.1 Source, nature and quantity

Industrial waste includes waste from manufacturing processes, mining and quarrying, electricity generation and gas and water supply activities. It also comprises non-process industrial waste from canteens, offices and ancillary activities – covered by European Waste Catalogue chapters 15 (packaging waste) and 20 (municipal waste). Total projected<sup>53</sup> generation of industrial waste, including non-process industrial waste, has increased by 6.9% from 9 million tonnes in 2001 to 9.6 million tonnes in 2004, as indicated in Table 16. Industrial waste generation is estimated from information provided by a total of 433 companies: 289 IPPC-licensed companies, from their annual environmental reports; and 144 non-IPC licensed companies, by way of sample survey. A scale up methodology is employed to estimate waste generation throughout the industrial sector.

The ten largest non-hazardous and hazardous industrial waste categories generated in 2004 are presented in Table 17. The top ten waste categories represent 86% and 89% of all non-hazardous and hazardous waste generation respectively. The majority of these waste generators are regulated by the EPA under IPPC licences. It is interesting to compare the top ten lists with similar data for 2001. Mining remains the predominant generator of non-hazardous waste (though tailings generated at the Arcon mine were not reported as waste in 2004 due to their backfilling as an engineering material used in mine construction). Flyash from the ESB's Moneypoint coal-burning power station remains a significant quantity – some 80% of the flyash is recycled and used in cement manufacture. Waste from the food processing (particularly slaughtering and rendering) and timber industries continue to feature strongly. Solvents and other process wastes from the chemical and pharmaceutical sector again dominate the hazardous waste section. One hazardous waste type that did not feature in the 2001 report is waste acid (reported in 2004 in the form of acid wastewaters).

### 6.1.1 Disposal and recovery of industrial waste

In 2004, a total of 35.4%, or 2,666,302 tonnes, of reported industrial waste was recovered, as indicated in Table 18, an increase from 25.5% from 2001. On-site recovery and disposal practices are well established and fully regulated in some industrial sectors, for example, solvent recovery or incineration in the chemical and pharmaceutical sector and landfill of tailings in the mining sector. A large proportion of industrial waste is exported for disposal or recovery, mainly from the slaughtering/rendering and chemical/pharmaceutical sectors and the principal exported industrial waste types are meat and bone meal and organic solvents. Further detail is provided in Table 19.

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<sup>53</sup> A sample of 433 companies, including many of the largest industrial enterprises, make up the industry dataset. Using sectoral data available from the Central Statistics Office, a projected quantity is calculated to represent industry as a whole.

**Table 16**            **Reported and projected generation of industrial waste, 2004 (scaled up to 100% coverage)**

Sector	NACE code	Hazardous waste (tonnes)		Non-hazardous waste (tonnes)		Total industrial waste (tonnes)	
		Reported	Projected	Reported	Projected	Reported	Projected
Food	DA	440	922	1,437,350	2,951,902	1,437,790	2,952,824
Basic Metals and Fabricated Metal Products	DJ 27	14,014	14,247	1,076,960	1,085,650	1,090,974	1,099,897
Chemicals, Chemical Products and Man Made Fibres	DG	164,892	185,834	107,464	135,852	272,355	321,686
Wood and Wood Products	DD	898	1,203	242,909	258,622	243,806	259,825
Pulp, Paper and Paper Products; Printing, Publishing	DE	4,314	5,608	10,170	211,456	14,485	217,064
Other Non-Metallic Mineral Products	DI	10,255	13,262	53,689	115,674	63,944	128,936
Electrical and Optical Equipment	DL	6,274	21,529	16,404	55,504	22,678	77,033
Textiles	DB 17	62	69	48,315	58,397	48,377	58,467
Basic Metals and Fabricated Metal Products	DJ 28	1,628	4,683	13,246	44,875	14,874	49,558
Machinery and Equipment not elsewhere classified	DK	903	2,498	3,866	39,833	4,769	42,331
Transport Equipment	DM 34	459	2,065	3,316	14,921	3,775	16,986
Rubber and Plastic Products	DH	650	980	8,162	12,660	8,812	13,640
Wearing apparel; dressing and dyeing of fur	DB 18	80	994	548	6,806	628	7,800
Transport Equipment	DM 35	415	1,469	644	2,282	1,059	3,752
Manufacturing not elsewhere classified <sup>54</sup>	DN	1,259	1,351	32,906	49,807	34,166	51,158
<b>Sub-total manufacturing</b>		<b>206,543</b>	<b>256,714</b>	<b>3,055,949</b>	<b>5,044,241</b>	<b>3,262,492</b>	<b>5,300,957</b>
Mining and quarrying	C	955	1,076	4,041,292	4,044,511	4,042,247	4,045,586
Electricity, gas and water supply	E	1,698	1,698	229,946	284,647	231,644	286,345
<b>Total</b>		<b>209,197</b>	<b>259,487</b>	<b>7,327,188</b>	<b>9,373,401</b>	<b>7,536,384</b>	<b>9,632,888</b>

(Source: IPPC annual environmental reports and responses to industrial survey)

<sup>54</sup> Includes Sector DF Coke, Refined Petroleum Products and Nuclear Fuel, for reasons of confidentiality.



**Table 17 Top ten reported non-hazardous and hazardous industrial wastes in 2004**

<b>EWC Code</b>	<b>Non-hazardous industrial waste description</b>	<b>Principal source(s)</b>	<b>Quantity (tonnes)</b>
01 03 06	Tailings from physical and chemical processing of metalliferous minerals	Tailings from Tara Mines	2,088,087
01 03 05 <sup>55</sup>	Tailings from physical and chemical processing of metalliferous minerals	Tailings from Anglo American Lisheen Mining	1,168,400
01 03 99	Other wastes from physical and chemical processing of metalliferous minerals	Red mud from Aughinish Alumina	1,056,421
01 01 01	Wastes from mineral metalliferous excavation	Waste rock from Tara Mines	745,872
02 02 03	Materials unsuitable for consumption or processing	Slaughtering and rendering	302,244
03 01 05	Sawdust, shavings, currings, wood, particle board and veneer	Sawmills, furniture, construction	225,201
02 02 02	Animal tissue waste	Slaughtering and rendering	220,918
02 01 06	Animal faeces, urine and manure, effluent	Slaughtering and rendering	213,674
10 01 03	Coal flyash	Moneypoint	185,977
02 05 02	Sludges from on-site effluent treatment	Dairy products industry	123,067
<b>Total</b>			<b>6,329,860</b>
<b>EWC Code</b>	<b>Hazardous industrial waste description</b>	<b>Principal source(s)</b>	<b>Quantity (tonnes)</b>
07 05 04*	Organic solvents, washing liquids and mother liquors	Pharmaceutical and chemical industries	105,357
07 05 03/4*	Organic solvents, washing liquids and mother liquors	Pharmaceutical and chemical industries	16,559
07 05 01*	Aqueous washing liquids and mother liquors	Pharmaceutical and chemical industries	14,475
06 03 99*	Salt cake (process residue)	Aughinish Alumina	13,655
07 05 03*	Organic halogenated solvents, washing liquids and mother liquors	Pharmaceutical and chemical industries	11,321
06 01 01*	Sulphuric acid and sulphurous acid	Electronics and glass manufacturers	10,435
07 05 13*	Solid wastes containing dangerous substances	Pharmaceutical and chemical industries	4,536
13 02 05*	Mineral-based non-chlorinated engine, gear and lubricating oils	All sectors	3,957
07 02 08*	Still bottoms and reaction residues	Pharmaceutical and chemical industries	3,681
15 02 02*	Absorbents, filter materials, wiping cloths, protective clothing	All sectors	1,843
<b>Total</b>			<b>185,818</b>

(Source: IPPC annual environmental reports and responses to industrial survey)

<sup>55</sup> Despite the use of a hazardous EWC code by the company, this waste is classified as non-hazardous.

**Table 18** Reported disposal and recovery of industrial waste, 2004

Disposal or recovery operation (TFS codes)		Hazardous waste (tonnes)	Non-hazardous waste (tonnes)	Total industrial waste (tonnes)
Landfill	D1	15,876	3,480,009	3,495,885
Land treatment	D2		37,505	37,505
Impoundment	D4	18	1,039,648	1,039,666
Engineered landfill	D5	312	45,718	46,030
Release to waters	D6	3,862	9,189	13,052
Release to sea	D7		374	374
Biological treatment	D8	2,342	20,508	22,850
Physico-chemical treatment	D9	13,270	1,906	15,176
Incineration on land	D10	83,649	80,754	164,402
Permanent storage	D12	1		1
Blending or mixing	D13	470	5,581	6,050
Repackaging prior to disposal	D14	4	13	17
Storage pending disposal	D15	355	26,549	26,905
<b>Sub-total disposal</b>	<b>D</b>	<b>120,159</b> <b>57.4%</b>	<b>4,748,126</b> <b>64.8%</b>	<b>4,868,285</b> <b>64.6%</b>
Direct reuse	R0	15	263,777	263,792
Reuse as fuel	R1	26,180	127,444	153,624
Solvent recovery	R2	50,573	745	51,317
Organic substance recycling	R3	3,056	404,593	407,649
Metal recovery	R4	2,488	32,799	35,287
Inorganic substance recycling	R5	578	864,891	865,468
Regeneration of acids or bases	R6	1,029	0.4	1,029
Recovery of components used for pollution abatement	R7	45	164	209
Recovery of components from catalysts	R8	362	76	438
Oil recovery	R9	2,302	598	2,900
Landspreading	R10	6	717,390	717,397
Use of residuals	R11	39	148,581	148,620
Waste exchange	R12	43	2,332	2,376
Storage pending recovery	R13	1,078	14,255	15,333
Unspecified recovery	RU		10	10
<b>Sub-total recovery</b>	<b>R</b>	<b>87,794</b> <b>42%</b>	<b>2,578,273</b> <b>35.2%</b>	<b>2,666,302</b> <b>35.4%</b>
Unspecified	U	1,243 0.6%	1,776 <0.1%	3,019 <0.1%
<b>Grand Total</b>		<b>209,197</b>	<b>7,327,186</b>	<b><sup>56</sup>7,536,384</b>

(Source: IPPC annual environmental reports and responses to industrial survey)

<sup>56</sup> Note, this is the reported quantity, not the projected 9,632,888 tonnes stated in Table 16.

**Table 19** Reported disposal and recovery of waste in surveyed industrial sectors, 2004

Sector name	NACE code	Disposal (tonnes)	Recovery (tonnes)	Unspecified (tonnes)	Total (tonnes)
<i>Manufacturing industry</i>					
Food	DA	185,094	1,252,456	240	1,437,790
Basic Metals and Fabricated Metal Products	DJ27	1,082,274	8,677	22	1,090,974
Chemicals, Chemical Products and Man Made Fibres	DG	113,283	158,731	341	272,355
Wood and Wood Products	DD	4,368	239,372	67	243,806
Other Non-Metallic Mineral Products	DI	56,626	7,313	5	63,944
Textiles	DB17	27,610	20,740	27	48,377
Electrical and Optical Equipment	DL	9,346	13,314	18	22,678
Basic Metals and Fabricated Metal Products	DJ28	2,019	12,247	608	14,874
Pulp, Paper and Paper Products; Printing, Publishing	DE	6,354	7,914	216	14,485
Rubber and Plastic Products	DH	3,903	4,767	142	8,812
Machinery and Equipment not elsewhere classified	DK	2,417	2,352	0	4,769
Transport Equipment	DM34	804	2,971	0	3,775
Transport Equipment	DM35	753	306	0	1,059
Wearing apparel; dressing and dyeing of fur	DB18	342	286	0	628
Manufacturing not elsewhere classified <sup>57</sup>	DN	25,222	8,940	4	34,166
<b>Sub-total manufacturing</b>		<b>1,520,416</b> <b>46.6%</b>	<b>1,740,386</b> <b>53.3%</b>	<b>1,690</b> <b>&lt;0.1%</b>	<b>3,262,492</b>
Mining and quarrying	C	3,262,909	779,332	6.14	4,042,247
Electricity, gas and water supply	E	85,060	146,483	101	231,644
<b>Grand Total</b>		<b>4,868,285</b> <b>64.6%</b>	<b>2,666,302</b> <b>35.4%</b>	<b>1,797</b> <b>&lt;0.1%</b>	<sup>58</sup> <b>7,536,384</b>

(Source: IPPC annual environmental reports and responses to industrial survey)

<sup>57</sup> Includes Sector DF Coke, Refined Petroleum Products and Nuclear Fuel, for reasons of confidentiality.<sup>58</sup> Note, this is the reported quantity, not the projected 9,632,888 tonnes stated in Table 16.

### 7.1.2 Conclusions

- C27 The profile of industrial waste has not changed significantly since the last survey in 2001. The greatest part of industrial waste is comprised of tailings and waste rock from two mining operations. The next greatest generator of waste is the slaughtering and rendering industry with large quantities of animal waste and meat and bone meal generated.
- C28 It is apparent that some industrial enterprises have reduced the generation of waste. While the reasons are not clear from the raw data, this suggests that many companies are now examining their waste generation and associated costs.
- C29 The quality of data remains poor in many cases, as identified from AERs and survey responses. It is clear that guidance and advice on waste quantification and monitoring is a priority need for many companies.

### 7.1.3 Recommendations

- R17 Studies should be undertaken to document good practices and success stories in waste minimisation. Case studies should be disseminated widely to demonstrate possibilities and opportunities for waste and pollution prevention.
- R18 Comprehensive guidance on waste classification and monitoring, building on existing guidance provided by, for example, the EPA<sup>59</sup>, Race Against Waste<sup>60</sup> and IBEC<sup>61</sup>, should be further promoted to industry and other reporting organisations to increase awareness of the importance of monitoring waste management and reporting accurate data.
- R19 Industries should actively participate in applying waste prevention, reduction, reuse and recycling principles and avail of opportunities provided under the National Waste Prevention Programme.

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<sup>59</sup> Guidance for IPPC and waste licensees on preparing annual environmental reports.

<sup>60</sup> For example, the *Small Change* and *Action at Work* guidance.

<sup>61</sup> For example, Pharmachem Ireland's *Guide to Waste Management*.

## 8. HAZARDOUS WASTE

### 8.1.1 Source, nature and quantity

Hazardous waste is generated by all sectors of society, including households, industry, agriculture, construction, healthcare and others. In 2004, the total projected quantity of hazardous waste was 723,921 tonnes, shown in Table 20. This compares to a projected estimate of 533,592 tonnes in 2001 and represents an increase of 36%. The increase is dominated by the reported generation of contaminated soil. The nature of hazardous waste varies according to source and it may also change over time as work practices change. For example, contaminated soil is usually generated from once-off projects and can therefore vary greatly from year to year. Hazardous waste information, as reported in this section, is compiled according to its location of treatment, recovery or disposal, as follows:

- ❑ On-site treatment of hazardous waste – reported by industrial (mostly IPPC) facilities;
- ❑ Treatment at licensed or permitted facilities in Ireland – reported directly by these organisations (mostly waste licenced facilities) to the EPA and local authorities;
- ❑ Export of hazardous waste – from export authorisation reports (under the TFS Regulation) provided by local authorities; and
- ❑ Unreported hazardous waste – estimated from a methodology based on trade statistics and waste factors.

The total generation of hazardous waste is based on the sum of these elements. The industrial hazardous waste quantity in Table 20 is based on the reported generation of hazardous waste by industry (see Table 16).

**Table 20 Summary of reported and projected generation of hazardous waste**

Category of hazardous waste	2001 (tonnes)		2004 (tonnes)	
	<i>Reported</i>	<i>Projected</i>	<i>Reported</i>	<i>Projected</i>
Industrial hazardous waste	202,502	244,426	209,197	259,487
Other hazardous waste (reported)	72,185		110,083	
Contaminated soil (reported)	168,579		307,340	
Unreported	48,402		47,011	
<b>Total</b>	<b>491,669</b>	<b>533,592</b>	<b>673,631</b>	<b>723,921</b>

(Source: IPPC annual environmental reports; responses to industrial survey waste licence annual environmental reports; TFS records)

### 8.1.2 Reported hazardous waste

The reporting of hazardous waste management is, for the most part, soundly based. The on-site management of hazardous waste takes place at EPA IPPC-licensed facilities and is subject to annual reporting to the EPA. The off-site management of hazardous waste takes place predominantly at EPA waste-licensed facilities and is also subject to annual reporting. The export of hazardous waste is regulated by local authorities under the EU Transfrontier Shipment of Waste Regulation (259/93). However, there are some inconsistencies in this data as reported. For example, poor classification and description of hazardous waste is evident on the part of a large number of generators and managers of hazardous waste. Similarly, the export of contaminated soil was reported in 2004 as predominantly a disposal exercise. In earlier years, contaminated soil was exported in the main for recovery. The continued existence of two methods<sup>62</sup> of classifying recovery and disposal activities still creates some confusion and uncertainty in the classification of waste activities in Ireland.

Some trends are notable with regard to the location of treatment of hazardous waste:

- ❑ The treatment of hazardous waste at the site of generation decreased by 9.7% since 2001, illustrating a continuing trend.
- ❑ The treatment of hazardous waste at authorised facilities in Ireland has increased from 56,700 tonnes<sup>63</sup> in 2001 to 70,791 tonnes in 2004. The hazardous waste treatment industry continues to grow in scale and capacity, albeit at a slow rate. Significant new hazardous waste treatment capacity became available, or was licensed, in 2004/5. A full listing of authorised hazardous waste facilities is provided in Appendix B.
- ❑ The export of hazardous waste – excluding contaminated soil – continues to increase: by 3.7% in 2004 (compared to a remarkable 55.8% increase in 2003).

Table 21, Table 23 and Figure 9 present further information on the generation, destination and fate of reported hazardous waste in 2004.

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<sup>62</sup> Waste activities may be classified according to the Third Schedule and the Fourth Schedule of the Waste Management Acts 1996 to 2005 – waste-licensed activities report using this classification. Activities may also be classified according to Annexes IIA and IIB of the Waste Framework Directive (75/442/EEC) – all other activities report using this classification.

<sup>63</sup> The latter figure presented in the *National Waste Database Report 2001* is revised from 72,391 tonnes to 56,700 tonnes. This figure, and the corresponding figure for 2004, is based on reported hazardous waste treatment at authorised facilities. In 2001, these reports were supplemented with additional reports by industry of hazardous waste treatment at off-site facilities.

**Table 21** Generation and destination of reported and unreported hazardous waste, 2004

Category	On-site (tonnes)	Off-site (tonnes)	Exported (tonnes)	Unreported (tonnes)	Total (tonnes)
Solvents	63,351	1,072	95,495		159,918
Solvents (halogenated, where specified)	2,984	4	7,156	26	10,170
Oil waste (mineral oil)	200	22,229	2,043		24,472
Sheep dip				22,053	22,053
Industrial hazardous waste (other)	3,879	2,112	10,902		16,893
Salts and saltcake	13,655		0.2		13,655
Healthcare risk waste		12,864	187		13,051
Oily sludges		8,643	44	2,266	10,953
Lead-acid batteries			6,677	3,330	10,007
Equipment (electrical, electronic, mechanical)			9,121		9,121
Household hazardous waste (other)				8,765	8,765
Chemical waste (other)		55	8,251		8,305
Paint, ink and varnish waste (including packaging)		387	3,357	4,111	7,855
Acid and alkali waste	114	1,729	5,651		7,494
Asbestos waste	2	3,109	4,066		7,177
Aqueous washing liquids and mother liquors (07 __ 01*)	1,955	521	3,975		6,451
Solid wastes from MFSU of pharmaceuticals (07 05 13*)	0.7	41	5,882		5,924
Sludges and filter cakes	20	218	4,941		5,179
Batteries (small, non-lead acid)			340	3,279	3,619
Packaging (contaminated or containing residues)	22	1,799	1,338		3,159
Photographic chemical waste		409	1,541	2.2	1,952
Oil filters		603		1,327	1,930
Construction and demolition waste (hazardous)			1,685		1,685
Metal- and heavy metal-containing waste	29	15	1,580		1,623
Agricultural hazardous waste (other)				1,174	1,174
Absorbents, wiping cloths etc. (EWC 150202)	60	11	788		859
Fluorescent lamps		125	74	454	653
Pesticides, herbicides	25	0.3	575		600
Laboratory and general chemical waste	12	7.2	488		508
Thermal treatment and combustion residues	19		290		309
Medicines			308		308
Municipal hazardous waste (other)		1.4	223		224
Commercial hazardous waste (other)				224	224
Polychlorinated biphenyls			19		19
<b>Sub-total hazardous waste (excluding contaminated soil)</b>	<b>86,328</b>	<b>55,953</b>	<b>176,999</b>	<b>47,011</b>	<b>366,291</b>
Contaminated soil		14,838	292,502		307,340
<b>Total</b>	<b>86,328</b>	<b>70,791</b>	<b>469,501</b>	<b>47,011</b>	<b>673,631</b>

(Source: IPPC annual environmental reports; responses to industrial survey: waste licence annual environmental reports; TFS records)

**Table 22 Recovery and disposal of hazardous waste (excluding contaminated soil) in 2004**

	<b>Disposal or recovery activity</b>	<b>On-site</b>	<b>Off-site</b>	<b>Exported</b>	<b>Total</b>
D1	Landfill	13,657		5,484	19,142
D3	Deep injection			53	53
D4	Impoundment	18			18
D5	Engineered landfill		3,109	492	3,601
D8	Biological treatment	2,200		906	3,106
D9	Physico-chemical treatment	72	28,397	4,179	32,649
D10	Incineration on land	37,304		64,906	102,210
D12	Permanent storage			44	44
D13	Blending or mixing			70	70
D14	Repackaging prior to disposal			20	20
D15	Storage pending disposal	178		341	519
	<b>Sub-total disposal</b>	<b>53,429</b>	<b>31,506</b>	<b>76,494</b>	<b>161,430</b>
R0	Direct reuse	1.6			1.6
R1	Reuse as fuel	6,025		36,566	42,591
R2	Solvent recovery	26,597	837	20,472	47,906
R3	Organic substance recycling	78		2,681	2,760
R4	Metal recovery	29	2,428	20,342	22,799
R5	Inorganic substance recycling			4,758	4,758
R6	Regeneration of acids or bases			3,122	3,122
R7	Recovery of components used for pollution abatement			20	20
R8	Recovery of components from catalysts			42	42
R9	Oil recovery	169	21,181	4	21,354
R12	Waste exchange			820	820
R13	Storage pending recovery	0.1		11,305	11,305
	<b>Sub-total recovery</b>	<b>32,899</b>	<b>24,446</b>	<b>100,134</b>	<b>157,479</b>
U	Unspecified			372	372
		<b>86,328</b>	<b>55,952</b>	<b>177,000</b>	<b>319,281</b>

(Source: IPPC annual environmental reports; responses to industrial survey: waste licence annual environmental reports; TFS records)



**Table 23 Destination and fate of notified hazardous waste exports, including contaminated soil, 2004**

	Disposal (tonnes)					Recovery (tonnes)					Unspecified treatment (tonnes)	Total exports	
	Landfill	Incineration	Contaminated soil treatment	Other disposal	Total disposal	Reuse as fuel	Solvent recovery	Inorganic material recovery	Other recovery	Total recovery		Tonnes	%
Germany	6,088	26,648	256,658	3,399	<b>292,792</b>	3,906	20	2,433	4,851	<b>11,210</b>	149	<b>304,152</b>	<b>64.8</b>
Great Britain		19,708		36	<b>19,743</b>	4,877	20,335	2,161	28,266	<b>55,639</b>	72	<b>75,454</b>	<b>16.1</b>
Belgium	39	5,997		1,275	<b>7,312</b>	2,410	37	24,888	2,675	<b>30,009</b>	12	<b>37,333</b>	<b>8.0</b>
Denmark		20			<b>20</b>	22,499				<b>22,499</b>		<b>22,519</b>	<b>4.8</b>
Netherlands	138	1,051		902	<b>2,091</b>	2,498		10,731	1,854	<b>15,084</b>		<b>17,174</b>	<b>3.7</b>
Finland		11,475			<b>11,475</b>				4	<b>4</b>		<b>11,479</b>	<b>2.4</b>
Northern Ireland						477			4	<b>481</b>	82	<b>564</b>	<b>0.1</b>
France									452	<b>452</b>		<b>452</b>	<b>0.1</b>
USA									117	<b>117</b>		<b>117</b>	<b>&lt;0.1</b>
Switzerland							50			<b>50</b>		<b>50</b>	<b>&lt;0.1</b>
Italy									42	<b>42</b>		<b>42</b>	<b>&lt;0.1</b>
Sweden							30			<b>30</b>		<b>30</b>	<b>&lt;0.1</b>
Unspecified		8			<b>8</b>				71	<b>71</b>	55	<b>134</b>	<b>&lt;0.1</b>
<b>Total</b>	<b>6,265</b>	<b>64,906</b>	<b>256,658</b>	<b>5,612</b>	<b>333,441</b>	<b>36,666</b>	<b>20,472</b>	<b>40,212</b>	<b>38,337</b>	<b>135,688</b>	<b>371</b>	<b>469,500</b>	<b>100%</b>

(Source: TFS records)

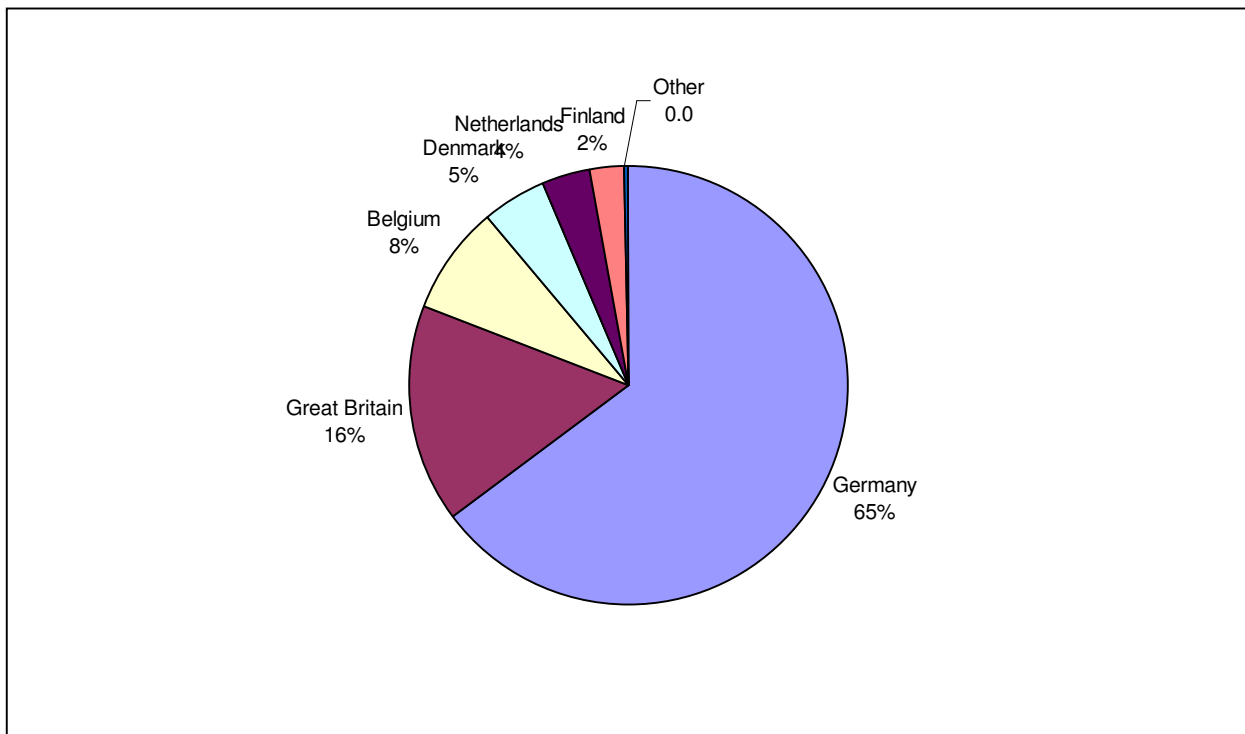


Figure 9 Destination of notified hazardous waste exports in 2004



Small batteries are hazardous waste and can be dropped off in special receptacles in schools, libraries, civic amenity sites etc. Contact your local authority for further information.

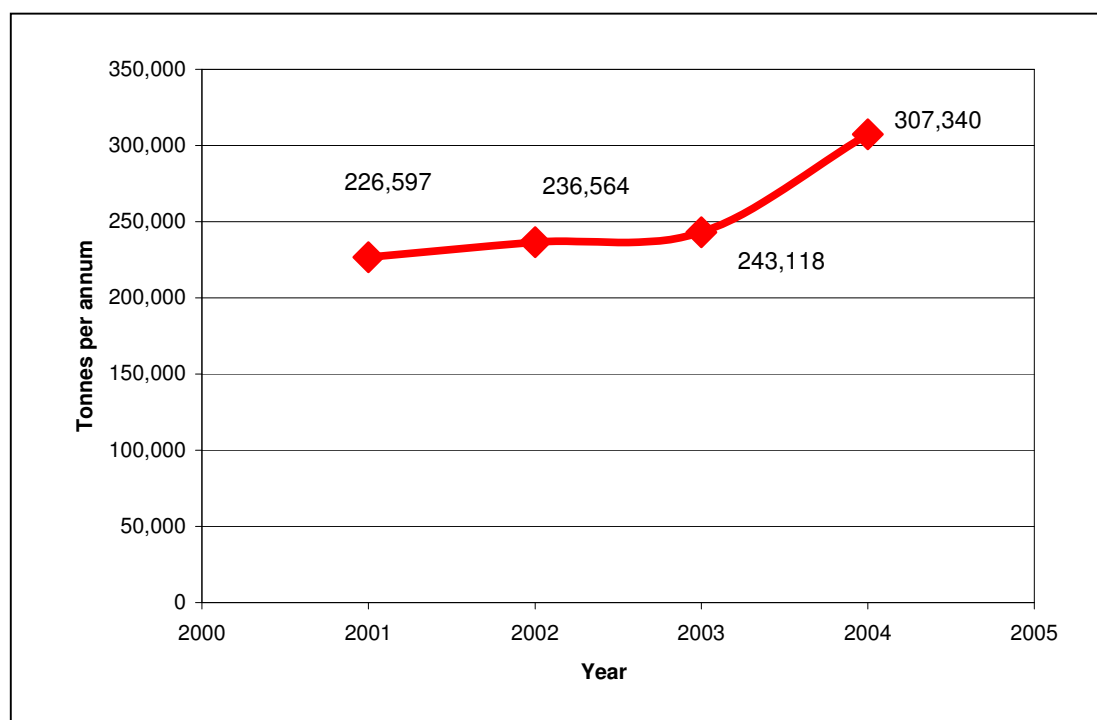
### 8.1.3 Contaminated soil

Contaminated soil was the largest single hazardous waste type generated in 2004, accounting for 307,340 tonnes, or 45.6% of total reported hazardous waste. More detailed information is presented in Table 24. Unlike most other hazardous waste types, contaminated soil generation results from once-off projects such as the redevelopment of the Dublin Docklands. Figure 10 illustrates the trend in reported contaminated soil from 2001 to 2004 – it is to be expected that the generation of contaminated soil will decrease as remediation projects are completed. The bulk of the contaminated soil generated in 2004 was exported for disposal. As mentioned above, this is unusual, given that contaminated soil was reported as being exported predominantly for recovery in previous years.

**Table 24 Recovery and disposal of contaminated soil in 2004**

	Disposal or recovery activity	On-site	Off-site	Exported	Total
D1	Landfill	0	0	240	240
D5	Engineered landfill	0	0	49	49
D9	Physico-chemical treatment	0	0	256,658	256,658
	<b>Sub-total disposal</b>	<b>0</b>	<b>0</b>	<b>256,947</b>	<b>256,947</b>
R1	Reuse as fuel	0	0	100	100
R5	Inorganic substance recycling	0	14,838	35,454	50,292
	<b>Sub-total recovery</b>	<b>0</b>	<b>14,838</b>	<b>35,554</b>	<b>50,392</b>
	<b>Total disposal and recovery</b>	<b>0</b>	<b>14,838</b>	<b>292,501</b>	<b>307,339</b>

(Source: TFS records; waste licence annual environmental reports)



**Figure 10 Reported contaminated soil, 2001 to 2004**

#### 8.1.4 *Healthcare waste*

Healthcare waste includes solid and liquid waste generated by the healthcare sector. The total quantity of healthcare waste treated in 2004 was 13,051 tonnes. This waste was treated at two facilities, Sterile Technologies Ireland (EPA Licence Reg. No. 55-1) and Ecosafe (EPA Licence Reg. No. 54-2), both located in Dublin.

#### 8.1.5 *Conclusions*

- C30 The generation of hazardous waste (excluding contaminated soil) increased by 36% between 2001 and 2004.
- C31 The greatest generator of hazardous waste is the chemical and pharmaceutical sector. The sector recently reported a 13% reduction in hazardous waste generation, despite increased production output.
- C32 The export of hazardous waste increased by 3.7% in 2004, a relatively small increase compared to that noted in 2003 (56%).
- C33 The quantity of contaminated soil continues to increase, reflecting the scale of urban redevelopment.
- C34 Though generally sound, the hazardous waste dataset suffers from many of the problems of the industrial dataset, for example, waste classification and monitoring.

#### 8.1.6 *Recommendations*

- R20 Studies should be undertaken to document good practices and success stories in hazardous waste minimisation. Case studies should be disseminated widely to demonstrate possibilities and opportunities for waste and pollution prevention.
- R21 The dependence on overseas recovery and disposal facilities for hazardous waste should be examined in the context of the review of the *National Hazardous Waste Management Plan*, to be carried out during 2006.
- R22 Industry and commerce should embrace the principles of waste prevention, reduction, reuse and recycling and actively participate in initiatives under the National Waste Prevention Programme.

## 9. AGRICULTURAL WASTE

### 9.1.1 Source, nature and quantity

Agricultural waste consists of organic and non-organic waste. In 2004, a total of 60,170,025 tonnes of organic agricultural waste was generated in Ireland, which is an increase of 3.5 million tonnes (6.1%) since 2001. The methodology used in 2001<sup>64</sup> has been revised following research work carried out by Teagasc<sup>65</sup> and the breakdown of organic agricultural waste generation is presented in Table 25. Therefore, the estimated generation of organic agricultural waste in 2001 and 2004 are not directly comparable<sup>66</sup> due to the revision of the methodology. However, the new methodology is considered more accurate than that which was used in 2001.

Following a recent ruling<sup>67</sup> in the European Court of Justice, animal manure spread on land as fertiliser (either on the site of production or on another site) may be considered not to be a waste if certain specific criteria are met. As this ruling was made in 2005, the generation of organic agricultural waste is presented in this report. However, the ruling may have wide implications for the way in which agricultural waste statistics are compiled and calculated in future.

**Table 25 Estimated generation of agricultural organic waste, 2004**

Waste category	Waste generation (tonnes)	Proportion of total (%)
Cattle manure and slurry	36,443,603	60.6
Soiled water (dairy)	18,377,550	30.5
Pig slurry	2,431,819	4.0
Silage effluent	1,139,231	1.9
Poultry litter	172,435	0.3
Sheep manure	1,336,336	2.2
Spent mushroom compost	274,050 <sup>68</sup>	0.5
<b>Total</b>	<b>60,170,025</b>	<b>100</b>

(Source: Teagasc)

Non-organic non-hazardous agricultural waste has not previously been quantified – little information is available and more focused research is required to estimate this waste stream. However, hazardous agricultural waste has been estimated and is included in Table 21.

<sup>64</sup> The 2001 methodology is described in the Agricultural Waste Factsheet 2001, available to download from the EPA website at [www.epa.ie/OurEnvironment/Waste/NationalWasteDatabase](http://www.epa.ie/OurEnvironment/Waste/NationalWasteDatabase).

<sup>65</sup> Further information can be obtained from Dr. Bernard Hyde, Teagasc, Johnstown Castle Research Centre, Wexford.

<sup>66</sup> If the 2001 methodology was employed for 2004, the estimated generation of organic agricultural waste is 52,371,999 tonnes, a decrease of 7.6% since 2001.

<sup>67</sup> Commission of the European Communities v Kingdom of Spain 8 September 2005 (C-121/03) and Commission of the European Communities v Kingdom of Spain 8 September 2005 (C-416/02), available at [www.curia.eu.int](http://www.curia.eu.int).

<sup>68</sup> Teagasc, 2005. "Census of Mushroom Production, 2004". Teagasc, Kinsealy Research Centre, Dublin.

### *9.1.2 Conclusions*

- C35 The generation of organic agricultural waste has increased by 6.2% since 2001 but this can be mainly attributed to the use of a revised methodology.
- C36 The inclusion of organic agricultural waste in national waste statistics may be reviewed in the future, following a recent ruling from the European Court of Justice.

### *9.1.3 Recommendations*

- R23 Research should be carried out to quantify the generation of non-organic agricultural waste, both hazardous and non-hazardous categories.

## 10. WASTE MANAGEMENT INFRASTRUCTURE

### 10.1 Waste recovery infrastructure and capacity

#### 10.1.1 Separate collection facilities

The availability of infrastructure for collection of recyclables is improving each year. Most householders are now provided with kerbside collection of mixed dry recyclables in addition to access to bring facilities and civic amenity sites. Table 26 provides information on bring banks and civic amenity sites from 2002 to 2004<sup>69</sup>. Despite the increased availability of kerbside separate collection schemes, bring banks and civic amenity sites continue to be necessary for the collection of material which cannot be presented for kerbside collection. This includes glass, plastic in some areas, wood, garden waste, waste electrical and electronic equipment and household hazardous waste such as batteries, fluorescent tubes and chemicals. It is expected that there will be a significant increase in the quantity of waste accepted at civic amenity sites in the next few years due to the implementation of the waste electrical and electronic equipment (WEEE) legislation<sup>70</sup> since August 2005.

**Table 26 Bring banks and civic amenity sites, 2002 to 2004**

	2002 <sup>71</sup>	2003 <sup>71</sup>	2004
<b>Number of bring banks</b>	1,636	1,692	1,929
<b>Quantity collected at bring banks (tonnes)</b>	35,920	53,001	76,023
Size range of bring banks (no. of bring banks):			
No data on size			602
<5 tonnes per annum			416
5-10 tonnes per annum			190
10-50 tonnes per annum			516
50-100 tonnes per annum			119
100-500 tonnes per annum			36
>500 tonnes per annum			50
<b>Number of civic amenity sites</b>	49	60	69
<b>Quantity collected at civic amenity sites (tonnes)</b>	61,197	47,686	83,562
Size range of civic amenity sites (no. of CA sites):			
No data on size			4
<5 tonnes per annum			8
5-10 tonnes per annum			1
10-50 tonnes per annum			3
50-100 tonnes per annum			5
100-500 tonnes per annum			17
>500 tonnes per annum			31

(Source: local authority survey)

<sup>69</sup> Civic amenity sites are usually purpose-built supervised facilities accepting a wide range of recyclables materials, while bring banks are not manned and accept a limited range of recyclable materials.

<sup>70</sup> Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005 (S.I. No. 340 of 2005);

<sup>71</sup> Data on the size range of bring banks and civic waste facilities was not compiled in 2002 or 2003.

The number of bring banks and civic amenity sites in operation in each local authority area is indicated in Table 27. With increasing charges for household waste collection service, it is likely that we will see an increase in the use of bring facilities in the future.

**Table 27 Bring banks and civic amenity sites in operation in 2004**

Local authority	Bring banks	Civic amenity sites	Local authority	Bring banks	Civic amenity sites
Carlow	39	3	Limerick City	38	2
Cavan	28	2	Longford	22	0
Clare	52	4	Louth	38	1
Cork	149	5	Mayo	85	2
Cork City	41	1	Meath	24	2
Donegal	110	1	Monaghan	22	1
Dublin City	112	2	North Tipperary	36	3
Dun Laoghaire-Rathdown	62	1	Offaly	48	2
Fingal	84	2	Roscommon	33	2
Galway	79	3	Sligo	37	1
Galway City	15	1	South Dublin	50	1
Kerry	88	5	South Tipp	73	2
Kildare	94	1	Waterford	43	3
Kilkenny	44	3	Waterford City	24	1
Laois	37	1	Westmeath	55	2
Leitrim	38	0	Wexford	125	2
Limerick	47	4	Wicklow	57	3
			<b>Total</b>	<b>1,929</b>	<b>69</b>

(Source: local authority survey)

### 10.1.2 Materials Recycling capacity in Ireland

A total of 315,628 tonnes of material was recycled in Ireland in 2004, an increase of 10.5% since 2003. There has been a marginal increase in the overall proportion of waste actually recycled<sup>72</sup> in Ireland from 25% in 2003 to 26.2% in 2004, as illustrated in Table 28.

<sup>72</sup> While collection infrastructure for recyclable materials is well established in Ireland and continuing to develop, the processing capacity (materials recycling) for collected recyclables is largely based outside Ireland.



**Table 28 Waste recycled in Ireland in 2003 and 2004 (not including imports)**

Material	2003		2004	
	Tonnes	%	Tonnes	% <sup>73</sup>
Paper and Cardboard	120,257	33.5	118,358	31.5
Glass	1,656	2.3	3,124	4.5
Plastic	11,603	24.1	8,718	15.6
Ferrous	4,263	1.0	3,757	0.9
Aluminium	4,548	26.6	3,450	18.1
Other Metals	3,214	12.4	3,849	9.9
Textiles	55	1.6	4,713	44.7
Wood	116,600	90.9	147,909	91.8
Others	23,557	43.0	21,751	50.6
<b>Total</b>	<b>285,754</b>	<b>25.0</b>	<b>315,628</b>	<b>26.2</b>

(Source: recycling organisations survey)

Therefore, Ireland continues to be substantially reliant on foreign materials-recycling infrastructure, accounting for 73.8% of recycled waste in 2004. As illustrated in Table 29, this includes ferrous metal, glass and paper and cardboard. Currently, no facilities exist in the Republic of Ireland for processing these materials, having closed due to economic reasons; the bulk of glass waste generated in recent years is processed in Northern Ireland. Table 4 in section 3.1.1 indicates the destinations of materials exported for processing.

**Table 29 Non-notified<sup>74</sup> waste recycled abroad, 2003 and 2004**

Material	2003		2004	
	Tonnes	%	Tonnes	% <sup>75</sup>
Paper and Cardboard	238,620	66.5	257,240	68.5
Glass	71,432	97.7	65,680	95.5
Plastic	36,556	75.9	47,186	84.4
Ferrous	429,956	99.0	430,232	99.1
Aluminium	12,539	73.4	15,642	81.9
Other Metals	22,776	87.6	34,929	90.1
Textiles	3,408	98.4	5,822	55.3
Wood	11,695	9.1	13,242	8.2
Others	31,229	57.0	21,273	49.4
<b>TOTAL</b>	<b>858,211</b>	<b>75.0</b>	<b>891,240</b>	<b>73.8</b>

(Source: recycling organisations survey)

Some waste materials, mainly plastic, are also imported into Ireland for reprocessing. Table 30 illustrates the quantity of waste exported from and imported into Ireland for reprocessing in 2004.

<sup>73</sup> These percentages refer to the recycling of material in Ireland, as a percentage of the total recycling (in Ireland and abroad) of each material.

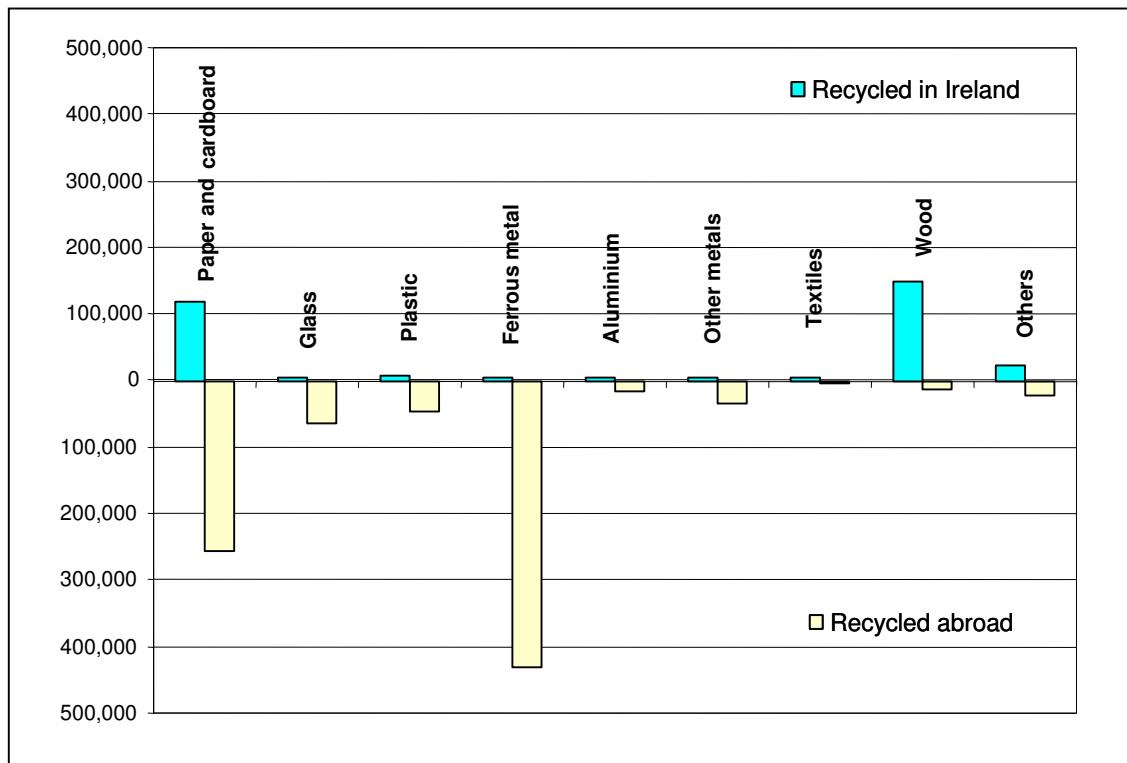
<sup>74</sup> Non-notified waste refers to waste which is considered "Green List" under the TFS Regulation and therefore can move freely without notification.

<sup>75</sup> These percentages refer to the recycling of material abroad, as a percentage of the total recycling (in Ireland and abroad) of each material.

**Table 30** Export and import of non-notified<sup>74</sup> waste, 2004

Material exported or imported for recovery	Export of non-notified waste (tonnes)			Import of non-notified waste (tonnes)		
	Total	Packaging waste	Non-packaging waste	Total	Packaging waste	Non-packaging waste
Paper and Cardboard	257,240	150,075	107,165	5,255	53	5,202
Glass	65,680	61,292	4,388	0	0	0
Plastic	47,186	43,374	3,812	48,374	48,374	0
Ferrous	430,232	37,373	392,859	38	38	0
Aluminium	15,642	1,392	14,251	0	0	0
Other Metals	34,929	364	34,565	17,339	0	17,339
Textiles	5,822	0	5,822	0	0	0
Wood	13,242	11,350	1,892	18	18	0
Others	6,398	765	5,634	0	0	0
Batteries	5,643		5,643	0	0	0
WEEE	9,225		9,232	0	0	0
<b>TOTAL</b>	<b>891,240</b>	<b>305,984</b>	<b>585,263</b>	<b>71,023</b>	<b>48,483</b>	<b>22,541</b>

(Source: recycling organisations survey)



**Figure 11** Recycling of waste in Ireland and abroad, 2004 (based on Table 30)

## 10.2 Landfill

A total of 6,438,085 tonnes of waste was accepted for disposal at 67 active (local authority and private/industrial) landfills in 2004, while a further 1,803,198 tonnes was accepted for recovery. A summary is provided in Table 31 and a more detailed breakdown, by facility, is provided in Appendix C.

**Table 31 Summary of all waste accepted at landfills in 2004**

	Local authority landfill (tonnes)	Private/Industrial landfill (tonnes)	Total (tonnes)
<b>Disposal</b>			
Household waste	1,213,998	910	1,214,908
Commercial waste (including non-process industrial waste <sup>76</sup> )	355,579	248,049	603,628
Industrial waste	21,685	4,523,284	4,544,969
Construction and demolition waste	13,275	0	13,275
Other	60,210	1,095	61,305
<b>Total disposal to landfill</b>	<b>1,664,747</b>	<b>4,773,338</b>	<b>6,438,085</b>
<b>Recovery</b>			
Construction and demolition waste	644,930 <sup>77</sup>	1,127,809	1,772,739
Composted organic waste used for engineering and landscaping	16,273 <sup>77</sup>	14,186	30,459
<b>Total recovery at landfill</b>	<b>661,203</b>	<b>1,141,995</b>	<b>1,803,198</b>

(Source: waste licence annual environmental reports; IPPC annual environmental reports)

### 10.2.1 Municipal landfill

A total of 34 landfills accepted 1,818,535 tonnes of municipal waste in 2004, a marginal decrease from 1,832,624 tonnes accepted at 35 landfills in 2003. This consisted of 1,214,908 tonnes of household waste, 561,079 tonnes of commercial waste, including 42,549 tonnes of non-process industrial waste. The breakdown of waste reported as having been accepted at each landfill is presented in Table 32. Landfill is the only disposal option currently available in Ireland for municipal waste.

<sup>76</sup> 42,549 tonnes in 2004

<sup>77</sup> Including waste accepted at closed municipal landfills for restoration purposes.

**Table 32 Municipal waste landfills operating in 2004**

<b>EPA Licence Reg. No.</b>	<b>Landfill</b>	<b>Waste Management Planning Region</b>	<b>Household waste (tonnes)</b>	<b>Commercial waste (tonnes)</b>	<b>Non-process industrial waste (tonnes)</b>	<b>Total municipal waste (tonnes)</b>
1-3	North Kerry	Clare Limerick Kerry	32,581	14,208	0	46,789
17-2	Gortadroma	Clare Limerick Kerry	25,600	19,559	0	45,159
109-1	Inagh	Clare Limerick Kerry	28,964	14,330	0	43,294
27-2	Pollboy	Connaught	48,366	39,100	13,696	101,161
67-1	Rathroeen	Connaught	20,845	7,262	782	28,888
59-2	Ballagherreen	Connaught	23,153	5,691	0	28,844
21-1	Derrinmera	Connaught	23,969	3,732	826	28,526
22-1	East Cork	Cork	47,634	2,991	237	50,861
12-2	Kinsale Road	Cork	48,280	1,705	0	49,985
89-1	Derryconnell	Cork	6,993	743	0	7,735
68-2	Youghal	Cork	3,721	1,290	365	5,377
70-1	Benduff	Cork	890	0	0	890
24-1	Ballynacarrick	Donegal	24,333	12,232	0	36,565
90-1	Balbane	Donegal	187	0	0	187
4-3	Arthurstown	Dublin	424,067	0	0	424,067
9-2	Balleally	Dublin	69,915	121,890	0	191,805
15-1	Ballyogan	Dublin	65,407	5,064	0	70,471
81-2	KTK	Kildare	0	248,049	0	248,049
26-2	Kyletalesha	Midlands	27,916	9,814	1,019	38,749
29-2	Derryclure	Midlands	23,423	5,266	5,495	34,184
28-1	Ballydonagh	Midlands	21,712	7,482	1,501	30,695
78-1	Ballaghveny	Midlands	23,057	4,553	0	27,610
60-2	Whiteriver	North East	32,087	3,223	18,274	53,584
77-2	Corranure	North East	48,727	0	0	48,727
20-1	Scotch Corner	North East	35,307	3,758	0	39,065
146-1	Knockharley	North East	910	0	0	910
16-2	Killurin	South East	25,534	6,538	0	32,072
25-1	Powerstown	South East	19,857	5,247	0	25,104
30-2	Dunmore	South East	11,025	10,612	355	21,992
74-2	Donohill	South East	13,825	2,709	0	16,534
75-1	Tramore	South East	15,529	0	0	15,529
18-1	Kilbarry	South East	9,404	7	0	9,411
32-1	Dungarvan	South East	240	0	0	240
66-2	Rampere	Wicklow	11,451	4,025	0	15,476
	<b>Totals</b>		<b>1,214,908</b>	<b>561,079</b>	<b>42,549</b>	<b>1,818,535</b>

(Source: waste licence annual environmental reports)

### *10.2.2 Landfill capacity*

The current remaining landfill capacity for municipal waste in the whole country is estimated to be 8 years, as shown in Table 33. Dublin and Donegal each have less than five years remaining capacity. The two commercial incinerators recently licensed could increase the annual capacity for disposal of municipal waste.

The calculations in Table 33 present a snapshot at a point in time in December 2005 of municipal waste disposal rates and available landfill capacity. There are a number of uncertainties associated with the calculations, for example:

- It is assumed in the calculation that disposal rates will remain constant at the levels advised by the landfill operators and that all licensed capacity will be utilised at some point in the near future. Of the landfills listed in the table as “not yet operational”, East Galway Landfill (EPA Licence Reg. No. 178-1) will commence operation in early 2006; Ballynagran Landfill’s (EPA Licence Reg. No. 165-1) commencement is anticipated in 2006; Bottlehill Landfill (EPA Licence Reg. No. 161-1) and Holmestown Landfill (EPA Licence Reg. No. 191-1) will commence operation ca. 2007; up to 70% of Rathroeen Landfill’s (EPA Licence Reg. No. 67-1) remaining licenced capacity will, if commenced, be available from 2008.
- No account has been taken of the sharing of facilities between regions, for example:
  - the Dublin Region, with an estimated 2.6 years remaining landfill capacity, intends using landfills in neighbouring Meath, Kildare and Wicklow as an interim measure. It is stated in the Dublin Waste Management Plan (November 2005) that this short term measure will be adopted by the Region until such time as the new facility planned for Fingal is operational;
  - Kildare County Council currently uses baling stations in South Dublin with subsequent disposal at Arthurstown landfill. In the draft Kildare Waste Management Plan (July 2005) it is stated that Kildare County Council will consider cooperating with neighbouring regions and/or the private sector in the provision of landfill capacity.
- The proposed facilities at Drehid (EPA Licence Reg. No. 201-1) and Usk (EPA Licence Reg. No. 168-1) will, if authorised, provide significant capacity in the Greater Dublin Area.

**Table 33 Remaining capacity at municipal waste landfills, December 2005**

Waste Management Planning Region	Estimated annual MSW landfill	Estimated remaining capacity at licensed landfills		Facilities included in calculation
	Tonnes	Tonnes	Years	
Clare Limerick Kerry	185,294	2,496,767	13.5	North Kerry (1-3); Gortadroma (17-2); Inagh (109-1).
Connaught	186,259	1,604,913	8.6	Rathroeen (67-1); Ballaghadereen (59-2); Derrinmera (21-1); East Galway (178-1, not yet operational).
Cork	506,161	6,025,519	11.9	East Cork (22-1); Kinsale Road (12-2); Derryconnell (89-1); Youghal (68-2); Donohill (74-2); Bottlehill (161-1, not yet operational).
Dublin	791,805	2,064,638	2.6	Arthurstown (4-3); Balleally (9-2).
Midlands	131,237	1,082,661	8.2	Kyletalesha (26-2); Derryclure (29-2); Ballydonough (28-1); Ballaghveny (78-1).
North East	319,649	3,954,784	12.4	White River (60-2); Corranure (77-2); Scotch Corner (20-1); Knockharley (146-1).
South East	133,526	1,259,974	9.4	Powerstown (25-2); Dunmore (30-2); Holmestown (191-1, not yet operational).
Donegal	36,565	165,000	4.5	Ballynacarick (24-1).
Kildare <sup>78</sup>	248,049	701,951	2.8	KTK (81-2).
Wicklow	145,476	2,189,524	15.1	Rampere (66-2); Ballynagran (165-1, not yet operational).
<b>National</b>	<b>2,684,021</b>	<b>21,545,732</b>	<b>8</b>	

### 10.2.3 Inert landfill

Table 34 illustrates the quantity of inert waste<sup>79</sup> accepted at landfills in 2004, including municipal landfills undergoing restoration and IPPC facilities with on-site landfills. Of the 1,619,570 tonnes, a total of 1,029,190 tonnes (63.5%) was recovered and 590,380 tonnes (36.5%) was disposed.

<sup>78</sup> Two facilities Drehid (201-1) and Usk (168-1) are at advanced stages of licensing and planning and would, if authorised, provide significant additional capacity in County Kildare.

<sup>79</sup> As defined in Article 2 (e) of the Landfill Directive (1999/31/EC) Article 5 of the Directive – “waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in any way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste must be insignificant, and in particular not endanger the quality of surface water and/or groundwater”.

**Table 34 Waste acceptance at inert landfills in 2004**

Landfill	EPA Licence Reg. No.	Disposal (tonnes)	Recovery (tonnes)	Total (tonnes)
<b>Waste licenced facilities</b>				
Ballylinan Landfill Site	46-1	561	1,900	<b>2,461</b>
Kilmurry South	48-1	0	0	<b>0</b>
Murphy Concrete Manufacturing Ltd.	129-1	0	173,037	<b>173,037</b>
Murphy Concrete Manufacturing Ltd	151-1	0	682,015	<b>682,015</b>
<b>Former municipal landfills accepting construction and demolition waste for capping/restoration</b>				
Carrowbrowne Landfill	13-1	0	51,561	<b>51,561</b>
Longpavement	76-1	0	32,010	<b>32,010</b>
Marlinstown Landfill	71-2	0	24,000	<b>24,000</b>
<b>IPC facilities with on-site landfills</b>				
Finsa Forest Products Ltd., Scarriff, Co. Clare	22	0	0	<b>22</b>
Irish Cement Ltd., Castlemungret, Co. Limerick	29	550,000	0	<b>550,029</b>
Kerry Ingredients (Ireland) Ltd., Listowel, Co. Kerry	393	0	0	<b>393</b>
Premier Periclase, Drogheda, Co. Louth	376	19,904	0	<b>20,280</b>
Irish Asphalt Ltd., Blanchardstown, Co. Dublin	653	0	0	<b>653</b>
Irish Cement Ltd., Drogheda, Co. Louth	268	19,915	0	<b>20,183</b>
<b>Total</b>		<b>590,380</b>	<b>1,029,190</b>	<b>1,619,570</b>

(Source: waste licence annual environmental reports; IPPC annual environmental reports)

#### 10.2.4 Hazardous waste landfill

Table 35 shows that some 9,718 tonnes of Irish hazardous waste was landfilled off-site of generation in 2004 – some 3,453 tonnes at landfill sites in Ireland and 6,265 tonnes at landfill sites predominantly in Germany. The time series from 1996 serves to illustrate that hazardous waste landfill remains a capacity shortfall in Ireland and that a small, but relatively constant, amount of hazardous waste requires landfilling each year.

There is one landfill licensed in Ireland to accept hazardous waste – KTK Landfill in County Kildare is authorised to accept a maximum of 3,000 tonnes of asbestos waste per annum. No other landfill is authorised to accept hazardous waste. This raises the question as to the destination of reportedly landfilled hazardous waste. It is possible, and indeed likely in some cases, that the waste and/or activity classifications are incorrectly reported on the part of the industrial enterprises concerned, highlighting the need for guidance on waste reporting for industrial enterprises.

**Table 35** Reported landfill of hazardous waste, off-site in Ireland and abroad, 1996-2004

	1996	1998	2001	2002	2004
Hazardous waste landfilled off-site of generation in Ireland (tonnes)	2,964	3,430	4,693	-	3,453 <sup>80</sup>
Hazardous waste exported for landfill (tonnes)	5,630	2,037	1,547	4,148	6,265
<b>Total hazardous waste landfilled (tonnes)</b>	<b>8,594</b>	<b>5,467</b>	<b>6,240</b>	<b>-</b>	<b>9,718</b>

(Source: waste licence annual environmental reports; IPPC annual environmental reports)

### 10.3 Thermal treatment including incineration

#### 10.3.1 On-site industrial thermal treatment

On-site thermal treatment is carried out at six EPA-licensed IPPC facilities, treating 39,692 tonnes in 2004, as indicated in Table 36. These facilities are licensed only to treat waste generated on-site and thermal treatment of waste from other sites is not permitted.

**Table 36** Licensed industrial incinerators for on-site waste treatment, 2004

Name of Licensee	IPPC Licence Reg. No.	Number of units	Thermal treatment (tonnes)		Description
			Disposal by incineration (D10)	Reuse as fuel (R1)	
Roche Ireland	547	1	3,516	0	Solvents
Eli Lilly	546	2	15,447	0	Solvents and WWTP sludge
Smithkline Beecham (Manufacturing)	473	3	13,727	0	Solvents
Novartis Ringaskiddy	545	2	1,271	2,277	Solid and liquid waste incl. solvents
Yamanouchi Ireland Company	549	1	1,317	0	Hazardous liquid waste / solvents
Bristol-Myers Squibb <sup>81</sup>	552	1	2,137	0	Solvents
<b>Total treated</b>			<b>37,415</b>	<b>2,277</b>	
			<b>39,692</b>		

(Source: IPPC annual environmental reports)

<sup>80</sup> Reported by industrial and semi-state enterprises in 2004 as comprising 89 tonnes of boiler ash from electricity generation, 80 tonnes of calcium fluoride, 53 tonnes of resin, plus other smaller quantities. KTK Landfill reported the disposal of 3,109 tonnes of asbestos.

<sup>81</sup> Previously known as Swords Laboratories.



### 10.3.2 Commercial incineration

In November 2005, the EPA granted licenses for the first two commercial incinerators in Ireland. The licences provide for the operation of waste incineration facilities by Indaver Ireland at Carranstown, Co. Meath and Ringaskiddy, Co. Cork. The licences provide for incineration with energy recovery of non-hazardous waste in Carranstown and incineration with energy recovery of both hazardous and non-hazardous waste in Ringaskiddy. Some basic information on each of the licences is outlined in Table 37.

**Table 37 Proposed commercial incinerator developments by Indaver Ireland**

	Facility in Ringaskiddy, Co. Cork	Facility in Carranstown, Co. Meath
<b>EPA Licence Reg. No.</b>	186-1	167-1
<b>Date of issue</b>	24 November 2005	24 November 2005
<b>Licensed capacity</b>	Phase 1 – fluidized bed incinerator, maximum 100,000 tonnes per annum Phase 2 - moving grate incinerator, maximum 100,000 tonnes per annum	Maximum 150,000 tonnes per annum
<b>Waste types that may be accepted</b>	Phase 1 – hazardous and non-hazardous solid and liquid waste Phase 2 – non-hazardous solid industrial, commercial and household waste	Non-hazardous municipal waste and other non-hazardous waste

## 10.4 Conclusions and recommendations

### 10.4.1 Conclusions

#### *Waste recovery infrastructure and capacity*

- C37 The number of bring facilities available to householders continues to increase.
- C38 Materials-recycling facilities in Ireland provided 26% of Ireland's recycling capacity in 2004. There continues to be heavy dependence on foreign recycling infrastructure in Europe and Asia for 74% of Irish waste presented for recycling.
- C39 The quantity of waste exported for recycling increased by 4% and the quantity of waste imported increased by 9.5% in 2004.

#### *Landfill*

- C40 The use of landfill has remained relatively static for all waste streams – municipal, industrial, construction and demolition and mining waste.
- C41 The number of operating municipal landfills changed from 35 to 34 in 2004 – Marlinstown (EPA Licence Reg. No. 71-2) and Raffeen (EPA Licence Reg. No. 23-1) closed and Knockharley (EPA Licence Reg. No. 146-1) opened in 2004.

- C42 The apparent remaining landfill capacity is estimated to be 8 years. Dublin and Donegal have less than five years remaining capacity. Inter-regional co-operation in the Greater Dublin Region will provide an interim solution for the landfill of Dublin's (city and county) waste.
- C43 There remains no hazardous waste landfill capacity in Ireland other than for a small quantity of asbestos waste.

*Thermal treatment including incineration*

- C44 Some 39,692 tonnes of waste was treated (recovery and disposal) by on-site thermal treatment at six IPPC-licensed facilities.
- C45 Two commercial incineration facilities have been licensed by the EPA to treat non-hazardous municipal waste and hazardous waste.

## 10.4.2 Recommendations

*Infrastructure and treatment capacity*

- R24 The work of the Market Development Group should continue to be supported by appointing personnel to develop markets for recyclables in Ireland and reduce our dependence on foreign materials recycling capacity.
- R25 Local authorities should remain aware of the need to provide long lead times in planning for large scale disposal and recovery infrastructure – for example, landfill, incineration, composting and digestion.
- R26 In stating future capacity requirements in the revised regional and local waste management plans, local authorities should ensure that implementation schedules and responsibilities are included to ensure planned-for infrastructure is actually provided. Progress reviews and reports should be provided annually.
- R27 There is some progress towards planning for waste infrastructure at the national level. For example, the *National Strategy for Biodegradable Waste* will state the national needs for collection, diversion from landfill and alternative treatment for biodegradable waste nationally that will filter down into regional needs and regional waste planning programmes. The Market Development Group will provide an overview of strategic recycling capacity needs at the national level. The EPA will review the *National Hazardous Waste Management Plan* in 2006, taking Strategic Environmental Assessment requirements into account, and identify national needs in respect of the management of hazardous waste. Government and national organisations should remain involved, where appropriate, in waste management planning. Local authorities and relevant national organisations should continue to take responsibility for implementing those provisions of national strategies that relate to their respective areas of responsibility.

## 11. RESPONSES

### 11.1 Promotion of waste prevention

National and EU policy promotes the prevention and minimisation of waste as the most desirable outcome of improved waste management. Under the EU Sixth Community Environment Action Programme, a series of thematic strategies aim to improve resource efficiency and resource and waste management to bring about more sustainable production and consumption patterns. These thematic strategies are coupled with interlinking policy initiatives and include:

- ❑ Prevention and recycling of waste;
- ❑ Sustainable use of natural resources;
- ❑ Integrated product policy; and
- ❑ An environmental technologies action plan.

The European Commission adopted the Environmental Technologies Action Plan (ETAP) in January 2004. It seeks to exploit the potential of Environmental Technologies to improve both the environment and competitiveness, thus contributing to growth and job creation.

National policy reflects these aspirations and asserts that “a high priority should ... be placed on the integration of waste management issues into the production/consumption cycle, so that waste arisings are stabilised and current trends in waste production reversed”.

#### *11.1.1 National Waste Prevention Programme*

The National Waste Prevention Programme was launched by the EPA in April 2004 in line with the national policy document “Preventing and Recycling Waste – Delivering Change”. Initial funding of €2 million was provided. The goal of the Programme is to stabilise waste arisings, reverse current trends in waste production, decouple waste generation from economic growth and minimise the environmental impact of waste. The National Waste Prevention Programme is working to build on the success of existing programmes, such as the EPA’s Cleaner Greener Production Programme and Enterprise Ireland’s Environmentally Superior Products Programme. A National Waste Prevention Committee was appointed by the Minister for the Environment, Heritage and Local Government to oversee the development and implementation of the Programme and comprises a wide range of stakeholders from industry, commerce, agriculture, local authorities, non-governmental organisations and Government departments. This Committee is chaired by the EPA.

The following is a selection of projects currently ongoing or planned under the National Waste Prevention Programme:

- ❑ Local Authority Prevention Demonstration Programme - to provide resources and expertise to local authorities to design and implement integrated local prevention programmes (a call for proposals was made in November 2005).
- ❑ Resource efficiency/waste audits to provide guidance for organisations in monitoring waste and preparing waste reduction plans - in co-operation with Race Against Waste and the EU *Life*-funded HAZRED project<sup>82</sup> (led by the Environment Agency of England and Wales).
- ❑ Certified waste prevention and minimisation training: developed in part using grant-aid provided to IBEC, in consultation with the EPA and the Clean Technology Centre in the Cork Institute of Technology.
- ❑ Waste composition research in collaboration with local authorities.
- ❑ Ongoing annual compilation of national waste data.
- ❑ Review and Strategic Environmental Assessment of the *National Hazardous Waste Management Plan* which has prevention as its headline initiative.
- ❑ Waste prevention web pages to provide a one-stop-shop for waste prevention information in Ireland – [www.epa.ie/ourenvironment/waste](http://www.epa.ie/ourenvironment/waste).

## 11.2 Promoting good materials and waste management practices

A Cleaner Greener Production Programme (CGPP) was launched by the EPA in 2001. The aim of the Programme is to encourage companies to apply innovative, integrated preventive environmental strategies to processes, products and services to increase overall efficiency and reduce the risk to human health and the environment. In Phase 1 of the Cleaner Greener Production Programme, 29 projects were supported to the tune of €1.26 million. In Phase 2, some €1.76 million has been committed to the support of 22 ongoing projects. In August 2005, the EPA's Environmental Research, Technological Development and Innovation (ERTDI) Programme launched an Environmental Technologies Action Plan Research Call to provide support funding for research projects to develop technologies for environmental protection. Financial support will be made available for the application of and research into industrial technologies and processes which are less polluting and less resource-intensive and/or employing energy-saving technologies through improved production systems. The main areas of this call are:

- ❑ Cleaner Greener Production Programme (CGPP);
- ❑ Advanced Technologies for Environmental Protection;
- ❑ Analytical Monitoring and Forecasting; and
- ❑ Studies and Support to aid National Uptake of Environmental Technologies.

The call for proposals to support implementation of the Environmental Technologies Action Plan (ETAP) under Phase 3 of the Programme was made in 2005, with a budget of €3 million, and 54 applications were received for funding.

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<sup>82</sup> [www.hazred.org.uk](http://www.hazred.org.uk)

Enterprise Ireland operate the Environmentally Superior Products Programme which aims to support companies in assessing the potential for developing environmentally superior products within their existing or new product ranges; improving the environmental and business performance of industry through development of environmentally superior products; and improve the strategic capability of Small and Medium Enterprises (SMEs) through the exploitation of the market for environmentally superior products. Grant aid is available from Enterprise Ireland for this Programme and also for the development of environmental management systems in SMEs.

### 11.3 Producer Responsibility Initiatives

According to the 'polluter pays principle', waste generators should pay the full cost of the management of the waste they produce, including collection, treatment and disposal. Producer responsibility initiatives ensure that producers take responsibility and pay for the collection and recycling of their products when they become waste at end-of-life. Producer responsibility initiatives are a relatively recent development in Ireland, first introduced in 1997 for packaging waste and farm plastics, construction and demolition waste and, more recently, waste electrical and electronic equipment. National and EU policy provides for further producer responsibility obligations in respect of end-of-life vehicles, newsprint, tyres and batteries.

- The Packaging Directive has clearly been effective in Ireland in increasing the separate collection and recycling of packaging waste; a recycling rate of 56% was achieved in 2004, a year ahead of the EU 50% target for 2005.
- The Irish Farm Films Producers Group (IFFPG) is responsible for collecting farm plastics (bale wrap and bags) from farms for recycling in accordance with the Farm Plastics Regulations<sup>83</sup>. In 2004, 8,706 tonnes of farm plastics was collected by IFFPG and exported to Scotland for recycling as garden furniture.
- National policy makes the construction industry responsible for the collection and recycling of construction and demolition waste, a producer responsibility obligation. The industry has been given the task of ensuring that 85 per cent of construction and demolition waste is recycled by 2013. The first target of 50 per cent recycling by 2001 was achieved. While provisional data for 2004 indicate that the 2013 target of 85% recycling is within reach, the National Construction and Demolition Waste Council should continue to promote waste minimisation, accurate data collection and recycling of construction and demolition waste.
- The introduction of the WEEE Regulations<sup>84</sup> in August 2005 have formalised the producer responsibility initiative on waste electrical and electronic equipment, as required under the WEEE Directive<sup>85</sup>.

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<sup>83</sup> Waste Management (Farm Plastics) Regulations, 2001. (S.I. No. 341 of 2001).

<sup>84</sup> Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005 (S.I. No. 340 of 2005); Waste Management (Electrical and Electronic Equipment) Regulations 2005 (S.I. No. 290 of 2005); Waste Management (Restriction of certain hazardous substances in electrical and electronic equipment) Regulations 2005 (S. I. No. 341 of 2005).

## 11.4 Enforcement

A report entitled *The Nature and Extent of Unauthorised Waste Activity in Ireland* (EPA, 2005) illustrates the scale and extent of illegal waste activities in Ireland in recent years. A number of recommendations were made in the report that, in tandem with existing and other enforcement activities and initiatives, will bring about an end to large-scale unauthorised waste activities. Ongoing efforts will be required in the long-term to ensure that all operators keep within the bounds of the law and the conditions of their permits and licences.

A series of enforcement networks have been established under the auspices of the EPA's Office of Environmental Enforcement to cover such topics as:

- Unauthorised waste activities;
- Transfrontier shipment of waste;
- Packaging; and
- Farm plastics.

Membership of the networks is made up of enforcement personnel from a number of agencies including local authorities and Northern Ireland authorities. New networks will be established as needs arise. In 2006 a new enforcement network will be established to co-ordinate national enforcement of the recent WEEE Regulations<sup>84</sup>.

It is likely that an increased emphasis on enforcement will be a feature of data compilation for national waste reports. As data sources and reporting improves, more "dual" sources of similar information become available – for example, the notified export of mixed recyclable waste (which took place throughout 2004 and 2005), particularly to Germany, can now be cross-checked against much improved information provided by recycling organisations in their recycling returns to the EPA. This, combined with an increased number of site visits, will provide opportunities to improve generally the quality of information available and to detect inconsistencies or potentially unauthorised waste activities.

## 11.5 Increasing awareness and changing attitudes

The Race Against Waste ([www.raceagainstwaste.ie](http://www.raceagainstwaste.ie)) campaign, now entering its third year, seeks to promote good waste management practices, including waste reduction, among the general public. The Race Against Waste's philosophy is that by educating the individual, good practices can be promoted in the home, at work and in the community. Raising awareness and changing attitudes is a long-term project, and, as the Race Against Waste is now a well-recognised brand, commitment to this campaign should continue.

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<sup>84</sup> Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment, as amended by Directive 2003/108/EC of 8 December 2003; Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

The third year of the Race Against Waste Campaign will focus on ensuring the sustainability of all the major programmes, so that the campaign has a lasting legacy that will continue to deliver change. Year three will focus on the following:

- ❑ Action at Work – Seminars and workshops around the country for large organisations to build on partnerships with: Irish Hotel Federation, County Development Boards, Health Services Executive, Golf Union of Ireland, Football Association of Ireland and local authorities, to carry out waste audits, develop environmental management systems and increase overall staff awareness.
- ❑ National Prevention Network – A programme to develop waste prevention and reduction systems for large-scale sporting and social events, e.g. concerts, GAA Finals, etc.
- ❑ Waste Minimisation Clubs – Through the Small Change Seminars delivered throughout the country in Years 1 and 2, the need for waste minimisation clubs has developed whereby SMEs group together geographically to procure better waste management services.
- ❑ Mountmellick Green Town – a small rural town in the Midlands is the Race Against Waste pilot 'Greentown'. Through engaging with stakeholders in the town, the aim is to provide a model of best practice that other towns throughout the country can emulate. The aim is to reduce the overall generation of waste in the town and divert waste away from landfill.

## **11.6 Market development for recyclables**

In 2004, a Market Development Group was established in response to the growing rate of waste collected for recycling. As illustrated in this and earlier waste reports, the quantity of recyclable waste being exported exceeds the recycling of waste in Ireland by a ratio of 3:1. A multi-stakeholder Market Development Group was appointed by the Minister for the Environment, Heritage and Local Government and asked to focus on identifying barriers to the use and marketing of recyclable material and to make recommendations on how these barriers can be overcome. The Group will also identify projects for financial assistance. Three sub-groups were established to deal with the most recycled waste streams: paper and cardboard, glass and organic waste. Enterprise Ireland are providing secretariat support to the Group and will, from 2006, host the website of the Market Development Group at [www.envirocentre.ie](http://www.envirocentre.ie).

A similarly founded North South Market Development Group commissioned a study into the feasibility of an all-island paper mill with the capacity to handle waste paper generated on the island. A report on the study is anticipated in the near future.

## 11.7 Conclusions and recommendations

### 11.7.1 Conclusions

- C46 The ultimate objective for Ireland is to stabilise waste arisings, reverse current trends in waste production, decouple waste generation from economic growth and minimise the environmental impact of waste. Such long-term strategic objectives need sustained efforts over many years. A number of national initiatives are in train with a view to gathering momentum towards sustainable waste management. These initiatives include the National Waste Prevention Programme, national enforcement networks under the Office of Environmental Enforcement, the Race Against Waste, the Environmental Research and Technological Development Initiative and the Market Development Group.
- C47 There will, for the foreseeable future, remain a significant amount of waste that will require management in a manner that does not affect the environment. In accordance with the EU Waste Framework Directive, Ireland is obliged to seek to develop, where feasible, an integrated national waste disposal network that provides comprehensive waste infrastructure at competitive costs for commercial and household waste. Enforcement will remain a priority to ensure all waste generators and operators remain within the law.

### 11.7.2 Recommendations

- R28 Resources and commitment to national prevention, enforcement and awareness programmes should continue to be provided.



## APPENDIX A – INDICATORS

Indicator	2001	2002 <sup>86</sup>	2003 <sup>87</sup>	2004
<b>Municipal waste</b>				
Municipal waste collected/person	0.59 tonnes	0.63 tonnes	0.64 tonnes	0.68 tonnes
Municipal waste arising/person	0.69 tonnes	<sup>88</sup> 0.69 tonnes	0.73 tonnes	0.75 tonnes
Disposal rate for household and commercial waste collected	86.7%	79.3%	71.6%	66.4%
Recovery rate for household and commercial waste collected	13.3%	20.7%	28.4%	33.6%
Number landfills accepting municipal waste	48	39	35	34
Number of bring banks	1,436	1,636	1,692	1,929
<b>Household waste</b>				
Household waste collected/person	0.34 tonnes	0.37 tonnes	0.36 tonnes	0.37 tonnes
Household waste arising/person	0.37 tonnes	<sup>88</sup> 0.43 tonnes	0.43 tonnes	0.43 tonnes
Disposal rate for household waste	94.4%	90.7%	86.9%	80.5%
Recovery rate for household waste	5.6%	9.3%	13.1%	19.5%
<b>Commercial waste</b>				
Commercial waste collected/person	0.25 tonnes	0.25 tonnes	0.29 tonnes	0.30 tonnes
Disposal rate for commercial waste collected	76.2%	62.5%	52.7%	49.2%
Recovery rate for commercial waste collected	23.8%	37.5%	47.4%	50.8%
<b>Packaging waste</b>				
Best estimate of total quantity arising	872,917 tonnes	899,125 tonnes	1,006,287 tonnes	850,911 tonnes
Packaging waste arising/person	0.223 tonnes	0.229 tonnes	0.25 tonnes	0.21 tonnes
Best estimate of packaging waste recovered	221,266 tonnes	296,389 tonnes	419,600 tonnes	479,540 tonnes
Packaging waste recovered/person	0.056 tonnes	0.076 tonnes	0.105 tonnes	0.119 tonnes
National recovery rate	25.3%	33%	41.7%	56.4%
<b>Hazardous waste</b>				
	275,309 tonnes	249,439 tonnes	389,199 tonnes	469,501 tonnes
Quantity of hazardous waste exported	226,904 recovery	203,156 recovery	224,749 recovery	135,688 recovery
	47,929 disposal	42,419 disposal	162,821 disposal	333,441 disposal
	476 unspecified	3,864 unspecified	1,629 unspecified	372 unspecified

<sup>86</sup> Based on revised municipal waste generation quantity as per Table 2 and CSO population data from Census 2002 of 3,917,336.

<sup>87</sup> Based on revised municipal waste generation quantity as per Table 2 and CSO population data for April 2003 of 3,978,900.

<sup>88</sup> Revised from *National Waste Database Interim Report 2002*



## APPENDIX B – HAZARDOUS WASTE FACILITIES

### Licences, permits and applications for hazardous waste treatment and storage facilities at end 2004

Company name	Licence or Permit Reg. No.	Treatment or transfer facility	Hazardous waste operations	Principal hazardous wastes treated or proposed to be treated	Quantity treated in 2004 (Hazardous + non-hazardous) (tonnes)	Quantity transferred in 2004 (tonnes)
<b>Operating facilities</b>						
Atlas Ireland	184-1	Treatment	Oils and oil filters processing, contaminated soils processing	Waste oils and sludges, contaminated soils, other hazardous waste	603 oil filters 14,838 contaminated soil 21,181 waste oil	787
AVR-Safeway	50-1	Transfer	General chemical and other hazardous waste storage prior to export	None	-	23,108
Cedar Resource Management Ltd.	185-1	Transfer	General chemical and other hazardous waste treatment and storage prior to export	Chemical waste	-	311
Eco-Safe Systems	54-2	Treatment	Healthcare risk waste processing by heat treatment (disinfection) and shredding prior to landfill	Healthcare risk waste	1,248	104
Irish Bulk Liquid Storage	193-1	Treatment and transfer (licence issued July 04)	Solvents and waste oils storage prior to export	Solvents blending	Not operational	Not operational
Irish Lamp Recycling	02/2000	Pre-treatment	Fluorescent lamps pre-treatment prior to export of segregated materials and other wastes	Fluorescent lamps	125	
KMK Metals Recycling Ltd.	113-2	Transfer	Metal-rich wastes and sludges storage prior to export	None	-	3,207

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Company name	Licence or Permit Reg. No.	Treatment or transfer facility	Hazardous waste operations	Principal hazardous wastes treated or proposed to be treated	Quantity treated in 2004 (Hazardous + non-hazardous) (tonnes)	Quantity transferred in 2004 (tonnes)
MacAnulty Clear Drains	196-1	Pre-treatment and transfer (licence issued Nov 04)	Waste oils and oily sludges pre-treatment prior to onward transport	Waste oils and oily sludges	Not operational	Not operational
Indaver Ireland Limited	36-2	Transfer (Treatment: new activity licenced in 2004: solvent blending)	General chemical and other hazardous waste treatment and storage prior to export	Solvents blending	Treatment process not operational	20,751
Returnbatt	17/2002	Transfer	Batteries (lead acid and small batteries) storage prior to export	None	-	4,663
Rilta (t/a Sita Environmental)	192-1	Treatment (commenced Dec 04)	General chemical and other hazardous waste treatment and storage prior to export	Oily sludges, waste oils, oil filters, photographic waste, contaminated soil, contaminated drums, containers and IBCs, WEEE	110	14
Safety-Kleen Ireland	99-1	Transfer	Solvents and chemical waste storage prior to export	None	-	564
Shannon Environmental Services	41-1	Treatment and transfer	General chemical waste treatment and storage prior to export	Acid and alkali waste, photographic waste, industrial sludges, laboratory waste, solvents blending, other industrial and commercial chemical waste	4,844	741
Silver Lining Industries (Ireland)	122-1	Transfer	General chemical and electronic waste storage prior to export	None	-	1,860
SITA Environmental Drum Division	83-1	Treatment (closed Nov 04)	Drums and IBCs processing and recycling	Contaminated drums, containers and IBCs and those containing residues	1,700	-

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Company name	Licence or Permit Reg. No.	Treatment or transfer facility	Hazardous waste operations	Principal hazardous wastes treated or proposed to be treated	Quantity treated in 2004 (Hazardous + non-hazardous)	Quantity transferred in 2004 (tonnes)
SITA Environmental Waste Treatment Division	35-1	Treatment (closed March 05)	Oily sludges and oils pre-treatment and hazardous waste storage prior to export	Oily sludges and waste oils	11,692	2,410
Soltec (Ireland)	115-1	Treatment	Solvent distillation and recycling	Solvents distillation	837	44
Sorundon (Irish Environmental Services)	40-1	Transfer	General chemical and other hazardous waste storage prior to export	None	-	2,649
Sterile Technologies Ireland	55-1	Treatment	Healthcare risk waste processing by shredding and heat treatment (disinfection) prior to landfill	Healthcare risk waste	11,616	208
KTK Landfill	81-2	Landfill	Asbestos waste landfill	Asbestos	3,109	-

Total number of facilities in operation: 18

... of which processors: 10

#### Facilities Licensed in 2005

Indaver Ireland	186-1	Treatment	Integrated waste management facility, including incineration	Chemical waste including solvents	-	-
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\* Not all licences distinguish between hazardous and non-hazardous waste.

## APPENDIX C – LANDFILLS IN OPERATION IN 2004

	Local authority/ Operator	Facility name	Waste/ IPPC Licence Reg. No.	Total in 2001 (tonnes)	Total in 2004 (tonnes)	Disposal						Recovery	
						Household waste (tonnes)	Commercial waste (tonnes)	Industrial Waste (tonnes)	Construction and demolition waste (tonnes)	Street sweepings (tonnes)	Other wastes (tonnes)	Construction and demolition waste (tonnes)	Composted organic waste (tonnes)
1	Carlow County Council	Powerstown Landfill	25.1	21,356	28,332	19,857	5,247			1,061	471	1,696	
2	Cavan County Council	Corranure Landfill	77.2	9,800	49,597	48,727		414		456			
3	Clare County Council	Ballyduff Beg/Inagh	109.1		44,112	28,964	14,330			818			
4	Cork City Council	Kinsale Road Landfill	12.2	250,089	51,365	48,280	1,705						1,380
5	Cork County Council	East Cork Landfill Site	22.1	149,119	117,151	47,634	2,991	6,926			4,481	55,120	
6	Cork County Council	Youghal Landfill	68.2	53,091	20,473	3,721	1,290	365				15,096	
7	Cork County Council	Benduff Landfill	70.1	9,847	1,185	890					294		
8	Cork County Council	Derryconnell Landfill	89.1	14,000	8,324	6,993	743					589	
9	Donegal County Council	Ballynacarrick Landfill	24.2	8,300	37,746	24,333	12,232	88	87	1,006			
10	Donegal County Council	Balbane Landfill	90.1	4,107	190	187				3			
11	Dun Laoghaire-Rathdown County Council	Ballyogan Landfill/Recycling Park	15.1	97,808	168,178	65,407	5,064		12,367	4,191	2,958	78,192	
12	Fingal County Council	Balleally Landfill	9.2	282,477	252,073	69,915	121,890	5,993			5,105	49,171	
13	Galway City Council	Carrowbrowne Landfill	13.1		51,561							46,844	4,717
14	Galway County Council	Pollboy Landfill	27.2	175,939	154,743	48,366	39,100	13,696			1,421	51,633	528

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	Local authority/ Operator	Facility name	Waste/ IPPC Licence Reg. No.	Total in 2001 (tonnes)	Total in 2004 (tonnes)	Disposal						Recovery	
						Household waste (tonnes)	Commercial waste (tonnes)	Industrial Waste (tonnes)	Construction and demolition waste (tonnes)	Street sweepings (tonnes)	Other wastes (tonnes)	Construction and demolition waste (tonnes)	Composted organic waste (tonnes)
15	Kerry County Council	North Kerry Landfill	1.3	62,721	48,054	32,581	14,208	26	94	759	6	380	
16	Kildare County Council	Silliot Hill Landfill	14.1	64,127	0								
17	Kilkenny County Council	Dunmore Landfill	30.2	30,055	57,878	11,025	10,612	355		1,120		34,766	
18	Laois County Council	Kyletelesha Landfill	26.2	47,489	52,648	27,916	9,814	1,429	240	212	2,058	10,916	64
19	Limerick City Council	Longpavement	76.1		32,010							32,010	
20	Limerick County Council	Gortadroma	17.2	132,679	78,819	25,600	19,559	408		2,465	2,187	28,600	
21	Louth County Council	Whiteriver	60.2	31,500	69,841	32,087	3,223	18,587		5,755	1,064	9,125	
22	Drogheda Borough Council	Drogheda Landfill	33-1	27,085	8,744							8,744	
23	Dundalk Town Council	Dundalk Landfill/Civic Waste Facility	34.2		3,018							3,018	
24	Mayo County Council	Derrinumera Landfill	21.1	98,209	29,280	23,969	3,732	826		317	436		
25	Mayo County Council	Rathroeen Landfill	67.1	38,368	29,359	20,845	7,262	782		367		104	
26	Monaghan County Council	Scotch Corner Landfill	20.1	33,256	57,434	35,307	3,758	561	346	2,487	5,473	90	9,413
27	North Tipperary County Council	Ballaghaveny Landfill	78.1	22,935	32,621	23,057	4,553	578		1,226	3,207		
28	Offaly County Council	Derryclure Landfill	29.2	63,960	118,750	23,423	5,266	5,495			4,594	79,972	
29	Roscommon County Council	Ballaghaderreen Landfill	59.2	21,500	31,682	23,153	5,691	338		152		2,313	35

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	Local authority/ Operator	Facility name	Waste/ IPPC Licence Reg. No.	Total in 2001 (tonnes)	Total in 2004 (tonnes)	Disposal						Recovery	
						Household waste (tonnes)	Commercial waste (tonnes)	Industrial Waste (tonnes)	Construction and demolition waste (tonnes)	Street sweepings (tonnes)	Other wastes (tonnes)	Construction and demolition waste (tonnes)	Composted organic waste (tonnes)
30	South Dublin County Council	Arthurstown Landfill	4.3	334,333	424,067	424,067							
31	South Tipperary County Council	Donohill Landfill	74.2	42,000	23,275	13,825	2,709	4,511		1,028		1,203	
32	Waterford City Council	Kilbarry Landfill	18.1	81,700	16,394	9,404	7	1,107		969		4,906	
33	Waterford County Council	Dungarvan Waste Disposal Site	32.2	97,972	15,535	240				562		14,727	6
34	Waterford County Council	Tramore Waste Disposal Site	75.1	53,706	45,589	15,529			142	422	33	29,334	130
35	Westmeath County Council	Marlinstown Landfill	71.2	29,991	24,000							24,000	
36	Westmeath County Council	Ballydonagh Landfill	28.2	23,165	30,778	21,712	7,482	1,501				84	
37	Wexford County Council	Killurin Landfill	16.2	47,080	86,807	25,534	6,538			462	79	54,193	
38	Wicklow County Council	Ballymurtagh Landfill	11.1	80,079	19,110							19,110	
39	Wicklow County Council	Rampere Landfill	66.2	11,500	16,991	11,451	4,025	250		507		758	
40	Neiphin Trading Ltd.	Kerdiffstown	47.1		169,768							169,768	
41	KTK Landfill Limited	KTK Landfill	81.2		352,035		248,049	38,391				51,522	14,073
42	KTK Sand & Gravel Ltd	KTK Sand & Gravel	156.1		64,667							64,667	
43	Tegral Building Products Limited	Ballylinan Landfill Site	46.1		2,461			561				1,900	
44	Murphy Concrete Ltd	Murphy Concrete Manufacturing	129.1		173,037			26,138			1,095	145,803	



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	Local authority/ Operator	Facility name	Waste/ IPPC Licence Reg. No.	Total in 2001 (tonnes)	Total in 2004 (tonnes)	Disposal						Recovery	
						Household waste (tonnes)	Commercial waste (tonnes)	Industrial Waste (tonnes)	Construction and demolition waste (tonnes)	Street sweepings (tonnes)	Other wastes (tonnes)	Construction and demolition waste (tonnes)	Composted organic waste (tonnes)
45	Murphy Concrete Ltd.	Murphy Concrete Manufacturing	151.1		682,015							682,015	
46	Greenstar Holdings Limited	Knockharley Landfill	146.1		1,394	910						371	113
47	Bord na Mona	Clonbulloge Ash Repository	49-1	27,049	34,561			34,561					
48	Anglo American Lisheen Mining Limited		550	910,710	1,168,584			1,168,584					
49	Aughinish Alumina Limited		562	1,101,244	1,077,975			1,077,975					
50	Bord Na Mona Energy Limited - Blackwater group		502		905			905					
51	Bord Na Mona Energy Limited - Boora Works Leabeg		500		371			371					
52	Bord na Mona Energy Limited - Coolnamona group		507		34			34					
53	Bord Na Mona Energy Limited - Kilberry group of bogs		506		131			131					
54	Bord Na Mona Energy Limited - Lanesboro		504		1,008			1,008					

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	Local authority/ Operator	Facility name	Waste/ IPPC Licence Reg. No.	Total in 2001 (tonnes)	Total in 2004 (tonnes)	Disposal						Recovery	
						Household waste (tonnes)	Commercial waste (tonnes)	Industrial Waste (tonnes)	Construction and demolition waste (tonnes)	Street sweepings (tonnes)	Other wastes (tonnes)	Construction and demolition waste (tonnes)	Composted organic waste (tonnes)
55	Bord na Mona Energy Limited - Derrygreenagh Group		501		465			465					
56	Bord na Mona Energy Ltd. - Allen group		503		2,136			2,136					
57	Electricity Supply Board (Bellacorick)		627	9,000	6,686			6,686					
58	Electricity Supply Board (Moneypoint)		669	119,370	36,000			36,000					
59	Non-IPPC licenced company		-		4			4					
60	Irish Cement Ltd - Platin Cement Works		268	11,216	19,915			19,915					
61	Irish Cement Ltd.		29		550			550					
62	Irish Sugar plc		223	14,417	56			56					
63	Premier Periclase Limited		376	14,720	19,904			19,904					
64	Non-IPPC licenced company		-		238			238					
65	Roche Ireland Limited		547	319	523			523					
66	Tara Mines Limited		516	1,991,291	2,088,097			2,088,097					
67	Weyerhaeuser Europe Limited		593	200	50			50					
<b>Total</b>				<b>6,750,879</b>	<b>8,241,283</b>	<b>1,214,908</b>	<b>561,079<sup>89</sup></b>	<b>4,587,517<sup>90</sup></b>	<b>13,275</b>	<b>26,344</b>	<b>34,962</b>	<b>1,772,739</b>	<b>30,459</b>

<sup>89</sup> Not including 42,549 tonnes of non-process industrial waste (ref. Table 31 and Table 32)

<sup>90</sup> Includes 42,549 tonnes of non-process industrial waste (ref. Table 31 and Table 32)

