
2. CURRENT WASTE GENERATION

The 2001 National Waste Database (NWD) estimated that 2,704,035 tonnes of municipal waste was generated in Ireland in 2001. Figure 2.1 below details the breakdown of this total.

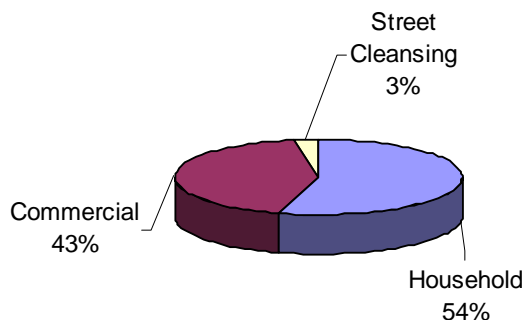


Figure 2.1: Municipal Waste Generated in Ireland 2001

Applying population figures to this data results in an average household waste generation per capita of 375 kg.

The National Waste Database Interim Report 2002 concluded that the rate of increase in the generation of municipal waste had slowed, with a total of 2,723,729 tonnes of municipal waste generated in 2002, which represented an increase of less than 1 % on 2001 figures.

Kildare County has seen an increase in waste generation since the adoption of the 2000 – 2005 Waste Management Plan. Although recycling is on the increase in the County, waste increase can be attributed to a buoyant economy and a 21.4 % per cent increase in the County's population between 1996 and 2002.

This section of the Waste Management Plan will quantify the various waste streams in County Kildare and identify trends in the waste generation within the County.

2.1. Data Sources

The data used in this section of this Plan was compiled from a number of sources including:

- National Waste Database Report 2001
- National Waste Database Interim Report 2002
- Kildare County Council
- annual environmental reports (AERs) for waste permits within County Kildare
- AERs from licenced waste facilities within the County

2.2. Reported Household Waste

Household waste arisings in County Kildare for 2003 are estimated at 62,636 tonnes. This figure is based on the 2002 population census in which County Kildare was estimated to have a population of 163,944 with a per capita generation of 382 kg, as discussed. This figure is considered reasonable.

Of the estimated 62,636 tonnes of household waste generated in Kildare, approximately 30,160 tonnes was collected by the local authority. The remaining 32,475 tonnes was collected by private operators. Table 2.1 details the breakdown of household waste collected in County Kildare in 2003.

Table 2.1: Kildare Household Waste Collected in 2003 (Tonnes)

Collector	Household Mixed Waste	Separate Collection	Bring Banks	Civic Amenity Site	Total
Kildare County Council	24,025	776	1,020	4,340	30,161
Private contractors	28,099	4,326	50	0	32,475
Total	52,124	5,102	1,070	4,340	62,636

All of the mixed household waste collected by Kildare County Council was transported to the transfer station at Silliot Hill Integrated Waste Management Facility, and then to Thornton's Recycling Ltd. in Dublin for baling, followed by disposal at Arthurstown landfill.

Waste collected by private collectors is disposed of both outside and within the County, or is sent for recycling.

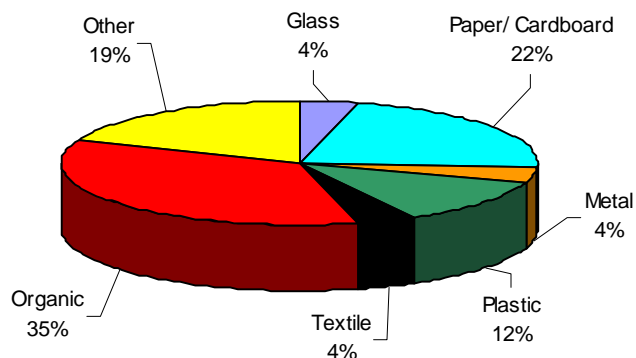
It is estimated that approximately 2,105 households within the County are not served by a collection service. Applying a typical waste generation factor of 1.28 tonnes per household, this equates to 2,695 tonnes of uncollected waste.

2.2.1. Household Waste Composition

The 2002 National Waste Database sets out the composition of household waste in Ireland, as given in Table 2.2 below.

Table 2.2: Composition of Household Waste in Ireland

Waste Type	% of Total	Household Amount (tonnes)
glass	4	2,505
paper/ cardboard	22	13,779
metal	4	2,505
plastic	12	7,516
textile	4	2,505
organic	35	21,923
other	19	11,901
Total	100	62,636



The Environmental Protection Agency (EPA) has estimated that the quantity of household packaging waste arisings in County Kildare is 16,473 tonnes per annum, or 26.3 % of the total household waste arisings (source: National Waste Database, 2001).

2.2.2. Household Hazardous Waste

At the moment, the majority of household hazardous waste is disposed to landfill, being mixed in with other household waste. However, certain types of household hazardous waste are collected separately at the Silliot Hill Civic Amenity Site. These include:

- batteries
- ink cartridges
- fluorescent tubes
- paint
- waste oil & filters
- electrical goods
- gas bottles

Approximately 274 tonnes of household hazardous waste was collected at Silliot Hill in 2003.

The National Hazardous Waste Management Plan 2001 estimates that household hazardous waste constitutes approximately 2 % of the total hazardous waste produced in Ireland.

2.3. Reported Commercial Waste

The commercial waste stream comes from a number of diverse sources, including supermarkets, offices and institutions. Commercial waste in County Kildare is largely collected by private contractors. An estimated 70,178 tonnes of commercial waste was generated and collected within the County in 2003.

Table 2.3: Reported Commercial Waste Collected in 2003 (tonnes)

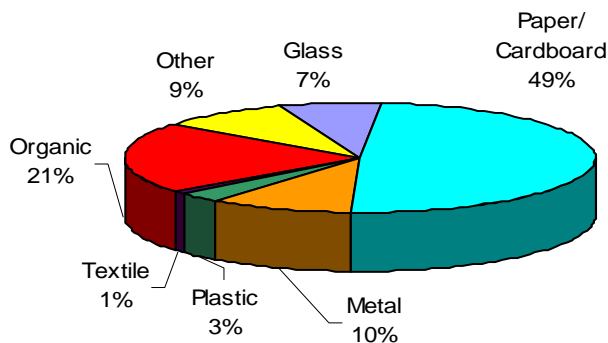
Collector	Commercial Mixed Waste	Separate Collection	Bring Banks	Civic Amenity Sites	Total
Kildare County Council	2,670	9	0	0	2,679
Private contractors	24,228	43,052	219	0	67,499
Total	26,898	43,061	219	0	70,178

2.3.1. Commercial Waste Composition

The 2002 National Waste Database set out the composition breakdown for commercial waste in Ireland as given in Table 2.4, overleaf.

Table 2.4: Composition of Commercial Waste in Ireland

Waste Type	% of Total	Commercial Amount (tonnes)
glass	7	4,912
paper/ cardboard	49	34,387
metal	10	7,018
plastic	3	2,105
textile	1	702
organic	21	14,737
other	9	6,317
Total	100	70,178



In June 2004, the EPA published a report entitled “Characterisation of Non-Household Municipal Waste in Ireland and the Development of an Approach to Tracking Municipal Waste Composition.” The survey examined the composition of waste arisings from a number of commercial sectors including:

- hotels
- supermarkets
- transport & communication
- financial services
- colleges
- restaurants
- hospitals
- public offices
- wholesale distribution
- other retailers

This study identifies cardboard/paper as the most significant element, accounting for 47.62 % of the commercial waste stream.

2.4. Reported Industrial Waste

The 2001 EPA National Waste Database reported a total of 160,886 tonnes of industrial waste generated in County Kildare, of which 2,143 tonnes (1 %) was hazardous. Non-hazardous industrial arisings are broken down based on the management of these wastes, as detailed in Table 2.5.

Table 2.5: Management of Non-Hazardous Industrial Waste in County Kildare 2001 (Source EPA 2001 NWD)

	Tonnes (estimated)
on-site treatment & disposal	2,490
off-site treatment within Ireland	154,233*
exported to Europe	1,689
total	158,412

* this largely consists of offal waste i.e. skins, bones etc.

2.5. Priority Waste Streams

The European Commission have established specific measures which aim to manage/prevent specific waste streams. The following waste streams were given priority by the EU:

- packaging waste
- healthcare waste
- waste electrical and electronic equipment
- polychlorinated biphenyls
- end-of-life vehicles
- batteries
- construction & demolition waste
- waste oils
- tyres

2.5.1. Packaging Waste

Items such as glass bottles, plastic containers, food wrappers, aluminium cans and timber pallets are all classified as packaging (EPA, 2001). The main sources of packaging waste are highlighted in bold in Table 2.6. Smaller amounts of packaging waste are also found as metals, such as aluminium cans.

Table 2.6: Packaging Waste Arisings in County Kildare (2003)

Waste Type	Household		Commercial	
	% of Total	Household Amount (tonnes)	% of Total	Commercial Amount (tonnes)
Glass	4	2,505	7	4,912
Paper/ Cardboard	22	13,779	49	34,387
Metal	4	2,505	10	7,018
Plastic	12	7,516	3	2,105
Textile	4	2,505	1	702
Organic	35	21,923	21	14,737
Other	19	11,901	9	6,317
Total	100	62,636	100	70,178

2.5.2. Healthcare Waste

Healthcare waste arisings are derived from hospitals, clinics, veterinary practices, dental practices, etc. The waste produced at these facilities can be divided into non-hazardous and hazardous waste. Non-hazardous healthcare waste generally consists of kitchen and packaging waste. The hazardous component consists of biological, infectious, chemical, toxic wastes, etc.

Non-Hazardous Healthcare Waste

In 2003, an estimated 10,561 tonnes of non-hazardous healthcare waste was generated in County Kildare. All of this waste was disposed of in Arhurstown and KTK landfills.

Balers for paper and cardboard have been installed in the larger health facilities such as Naas and Athy Hospitals. A dry recyclable collection is also operated at Naas General Hospital. Separately collected food waste is collected at Athy Hospital. Electrical and electronic waste is also collected at these facilities since January 2005.

Hazardous/Risk Health Care Waste

The Eastern Regional Health Authority is responsible for the organising of collection and disposal of healthcare risk waste within Counties Kildare, Wicklow and Dublin. The Authority collects waste from the main hospitals, health care centres and GP practices in County Kildare. In 2003 Naas General Hospital generated 31 kg of hazardous healthcare waste. An additional, 271 tonnes of hazardous healthcare waste was generated at a number of premises within the County and treated at licenced facilities. All of the clinical waste is collected and treated by licenced contractors.

The Eastern Regional Health Authority encourages waste minimisation and recycling initiatives for hazardous healthcare waste through its operation of a number of schemes such as the Disposal of Unwanted Medicines Properly (DUMP) scheme. This scheme is run in conjunction with 51 pharmacies in County Kildare, which distribute bags to customers who wish to dispose of unwanted medicine. One tonne of unwanted medicine was collected in County Kildare in 2004.

2.5.3. Waste Electrical & Electronic Equipment

The 2001 NWD estimated that between 35,000 to 82,000 tonnes of waste electrical and electronic equipment (WEEE) was generated in Ireland. This equates to 9 - 18 kg per person, or 1,475 to 2,950 tonnes for County Kildare in 2003. All types of WEEE are currently being collected at the integrated waste management facility at Silliot Hill. The waste collected is shipped to Germany under the Trans-frontier Shipment Regulations (TFS) for treatment and recycling.

2.5.4. Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are chlorinated chemical compounds which were once used in transformers and capacitors. There are no known sources of PCBs in County Kildare.

2.5.5. End-of-Life Vehicles

In 2003 a total of 300 end-of-life vehicles (ELVs) were managed by Kildare County Council. These vehicles had been recovered by the Council.

At present, there are four permitted sites for the scrappage of ELVs. These facilities act as transfer stations where the ELVs are stripped of good parts with the remainder of the vehicle being sent for final disposal at facilities such as Hammond Lane in Dublin. The four permitted sites dealt with an estimated 2,000 ELVs in 2004.

2.5.6. Batteries

Returnbatt Limited has the national contract for the collection of batteries. It has a recovery facility in County Kildare. A total of 131 tonnes of batteries were collected through separate schemes in County Kildare in 2003. A further 17 tonnes were collected at Silliot Hill Civic Amenity Site, making 148 tonnes in all. This includes car batteries, lead acid and sulphuric acid batteries.

2.5.7. Construction & Demolition Waste

The National Waste Database estimated that a total of 3,651,411 tonnes of construction and demolition (C&D) waste was processed in Ireland in 2001. This is considered to be a very conservative estimate. It is estimated that a total of 1,900,000 tonnes of C&D waste was managed within the functional area of Kildare County Council in 2003. Only 552,000 tonnes of this figure was generated in the County. The remaining 1,348,000 tonnes (mainly soil) were imported from outside the County.

The unprecedented growth in the Greater Dublin Area is one reason so much C&D material was imported into County Kildare. Dublin has few locations suitable for the acceptance of large volumes of soil, especially now that huge underground excavations have become so prevalent, e.g., the Port Tunnel, underground car parks, etc. County Kildare has facilitated the acceptance of such volumes of soil from the Dublin Region.

The indigenous growth in County Kildare is also a significant contributor to the volumes of soil generated. The practice of dealing with C&D waste is two-fold:

- clean, uncontaminated soils are suitable for acceptance at waste permit facilities such as land reclamation and quarry restoration projects
- bulky C & D waste is normally taken from sites by means of skips, for disposal or recovery at facilities licenced by the EPA

In practice, a small fraction of soils entering waste permit sites are slightly contaminated with elements of timber and metal and other construction wastes. This is generally acceptable where every effort has been made to remove such contaminants and their levels are insignificant and where these contaminants do not pose any risks to the environment. Facilities operating under waste permits are not suitable for soil contaminated with chemical pollutants such as hydrocarbons – except when those levels are naturally occurring. Clean brick, block and concrete rubble are acceptable at permitted facilities for re-use for the construction of hardstanding areas, access roadways, drainage, etc.

In 2003, 18,000 tonnes of contaminated soil was generated in County Kildare and disposed of at appropriate facilities.

2.5.8. Waste Oils

A reported 478 tonnes of waste mineral oil was generated in Kildare in 2003. This figure is based on waste returns from collectors and recycling centres. The waste oils are collected by specialist waste contracts such as Atlas Oil. There is one principal waste oil recycling facility in the Republic of Ireland. Recycled oil from this facility is burned as a fuel in large boilers at ESB power stations and other industrial facilities (source EPA, 2001).

Waste vegetable oils collected in Co Kildare in 2003 equated to 53 tonnes. There is a waste vegetable oil recovery facility in Castledermot, Co Kildare. It treated 1,330 tonnes of waste cooking and vegetable oil in 2003.

2.5.9. Tyres

The NWD estimated that 34,394 tonnes of waste tyres were generated nationally in 2001. If this figure is interpolated for the population of County Kildare (using 2002 CSO statistics) it can be estimated that approximately 1,439 tonnes of waste tyres were generated in County Kildare in 2003. Waste tyres are collected by a number of commercial operators who grade them and return a certain quantity for remoulding/rethreading (EPA, 2001). The majority of tyres are shredded and landfilled. However, this will be banned from July 2006. A permitted site for the recovery of tyres is in operation in County Louth by Crumb Rubber.

2.6. Hazardous Waste

Hazardous waste can be broken down into “reported” hazardous waste quantities, which are taken directly from reported industrial waste arisings (C1 consignment forms), and “unreported” hazardous waste, which is estimated from the factors used in the National Hazardous Waste Management Plan.

2.6.1. C1 Forms – Consignment of Hazardous Waste within the State

The Waste Management (Movement of Hazardous Waste) Regulations (1998) set the controls required for the movement of hazardous waste within the State. The Regulations require that a consignment note (C1 form) must always accompany the movements of hazardous waste within the State.

In 2003, 2,781 consignment notes were issued within County Kildare. Approximately 3,170 tonnes were generated within the County, with a further 2,900 tonnes of hazardous waste being transported into Kildare. Both Returnbatt and Irish Lamp Recycling Limited have national contracts for the collection of batteries and fluorescent lights. Both of these organisations have facilities within Kildare. A summary is provided in Table 2.7.

Table 2.7: Summary of C1 Forms issued within County Kildare

Name of Consignee	Origin of Waste	Type of Waste	No of C1	Quantity Tonnes*
Healthcare Waste Management	Kildare - Hospital	healthcare risk waste	1	0.05
Guardian Silver Lining	throughout Kildare	dry cleaning fluids, photocopier fluid, contaminated oil rags	54	14.9
ECO Safe	throughout Kildare	clinical, healthcare & veterinary waste	238	187
AVR Safeway	Kill, Co. Kildare	ink washings/ink solids	2	2.4
Contec Ltd	Dublin & Kildare	fluorescent tubes	14	1.1
IES	Dublin & Kildare	asbestos, mercury & clinical waste	86	175
KMK Metal Recycling	Kildare	computer monitors	1	0.09
KTK Landfill	Kerry, Sligo, Cavan, Meath, Kildare, Louth, Westmeath, Waterford, Wexford	asbestos containing material, such as sheeted asbestos	340	2,395
Initial (Rentokill)	Kildare	clinical waste sharps etc	16	0.3
Minchem	Kildare, Meath	mixed waste, fluorescent, contaminated soils	240	1,823

Table 2.7: Summary of C1 Forms issued within County Kildare Cont'd.....

Name of Consignee	Origin of Waste	Type of Waste	No of C1	Quantity Tonnes
Returnbatt	throughout Ireland	batteries	694	473
Safetykleen	Kildare	paint waste & thinners	14	2.8
STI	throughout Ireland	clinical waste	132	50
Safeway Warehousing	Kildare	corrosive waste	31	643
SES	Kildare	solvents	26	56
Site Recycling	Kildare	solvents	11	53
Solchem	Kildare	flammable & non regulated material	1	2.3
Other	throughout Ireland	batteries, lamp, asbestos	41	41.2
Irish Lamp Recycling Ltd	throughout Ireland	lamps	793	136
Atlas Oil	Kildare	waste oil	43	59
Total (tonnes)				6,115 *

* these figures (tonnes) are estimates, as it was assumed that 1,000 litres was equal to one tonne

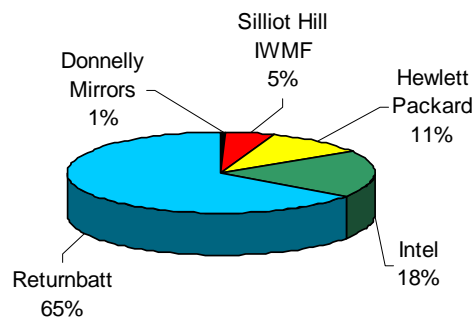
2.6.2. Export of Hazardous Waste

The export of waste from Ireland is controlled under the EU Regulation on the Trans-frontier Shipment of Waste. With certain exceptions, all waste exports must be notified to the local authority, and consent obtained from the relevant local authority in Ireland and the relevant competent authorities in the countries of transit and destination.

The 2001 National Waste Database identified County Kildare as one of the principal exporters of hazardous waste (6,863 tonnes). This can be attributed to the presence of electronic industries and hazardous waste facilities in County Kildare with a total of 5,833 tonnes of notified waste being exported from the county in 2003. Table 2.8 summarises the origin of these wastes.

Table 2.8: Origin of Notified Waste Export in 2003 – County Kildare

Company	Quantity Tonnes
Donnelly Mirrors	38
Silliot Hill Landfill (IWMF)	284
Hewlett Packard	633
Intel	1,074
Returnbatt	3,805
Total	5,834



*These figures (tonnes) are estimates as it was assumed that 1litre was equal to one tonne

2.7. Litter and Street Cleaning Waste

An estimated 1,631 tonnes of street cleaning waste was collected in County Kildare by the County Council in 2003. The majority of this waste was processed through Silliot Hill transfer station and landfilled at Arthurstown landfill.

2.8. Mining and Quarrying Waste

The majority of mining and quarrying waste is disposed on-site (for example, in tailing ponds, etc.), or used in land reclamation projects on other sites which are subject to waste permits.

2.9. Ash and other Incineration Residues

There are no records of ash or other incineration residues in the County in 2003.

2.10. Sewage Sludge Arisings

14,300 tonnes of municipal sewage sludge was produced in Kildare in 2003. This was digested anaerobically and/or lime-stabilised at the two regional waste water treatment plants. Following treatment, the sludge was transported for land-spreading. Nutrient Management Plans are prepared for areas prior to land-spreading.

Kildare County Council adopted a Sludge Management Plan for the County in 2001. The Plan identified the need to establish a sludge hub centre at Osberstown for the treatment of municipal sludge. Contracts have been awarded for the construction of this facility. This plant is due for completion in 2006.

2.11. Water Treatment Sludge

Many water treatment processes used to treat raw water sources to potable standards produce residues. This residue is known as water treatment sludge.

It has been estimated that the treatment of surface water for potable use could generate sludge at a rate of 20 – 30 tonnes dry solids per million/m³ treated. The type of the water treatment process and the quality of the raw water source will affect the quality of sludge arisings.

In 2003, 12,000 tonnes of water treatment sludges were produced at Ballymore Eustace. Ballymore Eustace is operated by Dublin City Council. All of the sludge produced at Ballymore Eustace is disposed of at KTK landfill (Waste Licence Register No. 81-2).

2.12. Agricultural Waste

General agricultural waste consists mainly of animal slurries, plastic wrap/bags for silage, fertiliser bags, and mushroom compost. Data on agricultural wastes was obtained from:

- Central Statistics Office
- Teagasc
- DoEHLG

Generation of agricultural slurries and manures in County Kildare is assumed to be only that generated during periods for which the animals are housed.

Cattle are assumed to have an average of a 16 to 20-week over-wintering period. Ewes are assumed to be housed for a maximum of six weeks during the lambing period. Pigs and poultry in intensive agricultural enterprises are housed all year round. Slurry requiring management from horses is assumed to be that from housing thoroughbred horses indoors at night for 26 weeks of the year.

Numbers of cattle, sheep, poultry and horses were taken as outlined by the most recent full agricultural census. Pig numbers for County Kildare were obtained from the "Summary of Commercial Units by County" (Teagasc, 2000).

Volumes of slurry and litter produced from poultry were taken from estimations made by the Department of Agriculture, Food and Rural Development and Teagasc. Estimations of volumes of these sludges, and of the density and dry solids content of these sludges is shown in Table 2.9.

Statistics for Spent Mushroom Compost (SMC) were obtained from the "Census of Mushroom Production" (2003), which estimated that approximately 16,645 tonnes of compost was used in the mushroom industry in Kildare in 2003. Teagasc assumes that the weight of SMC is similar to the weight of incoming fresh compost. At 31.5 % dry solids, SMC amounts to 5,240 tonnes dry solids (tDS) per annum in the County.

Total sludge generated by the agricultural sector in the County is shown in Table 2.9.

Table 2.9: Sludge Generated by the Agricultural Sector in County Kildare

Sludge Type	Weight (tonnes/year)	Dry Weight (tDS/y)	DS (%)	Density (t/m ³)
SMC	16,645	5,240	31.5	0.5
cattle	605,650	41,790	6.9	1
sheep	16,445	4,111	25	1
pigs	44,980	1,440	3.2	1
poultry litter	250	150	60	0.4
poultry slurry	3,780	1,130	30	1
horses	13,070	1,050	8	1
Total	700,820	54,911		

DS – dry solids content

2.13. Non - Hazardous Industrial Sludge

32,240 tonnes of non-hazardous industrial sludge was generated in County Kildare in 2003. All of these arisings were treated within the County, for example, by land spreading or landfilling.