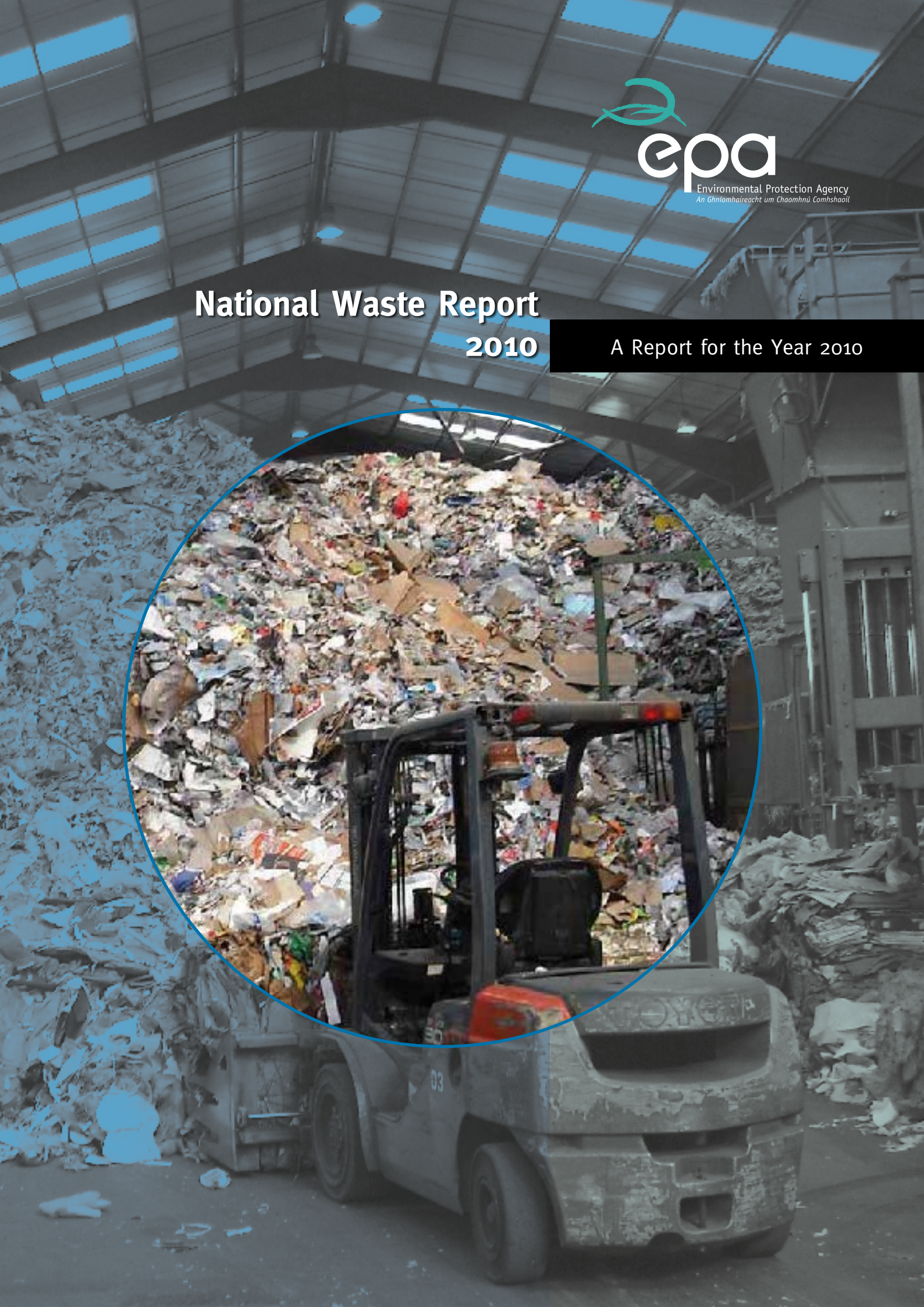

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

National Waste Report 2010

A Report for the Year 2010

Environmental Protection Agency

The Environmental Protection Agency (EPA) is a statutory body responsible for protecting the environment in Ireland. We regulate and police activities that might otherwise cause pollution. We ensure there is solid information on environmental trends so that necessary actions are taken. Our priorities are protecting the Irish environment and ensuring that development is sustainable.

The EPA is an independent public body established in July 1993 under the Environmental Protection Agency Act, 1992. Its sponsor in Government is the Department of the Environment, Community and Local Government.

OUR RESPONSIBILITIES

LICENSING

We license the following to ensure that their emissions do not endanger human health or harm the environment:

- waste facilities (e.g., landfills, incinerators, waste transfer stations);
- large scale industrial activities (e.g., pharmaceutical manufacturing, cement manufacturing, power plants);
- intensive agriculture;
- the contained use and controlled release of Genetically Modified Organisms (GMOs);
- large petrol storage facilities;
- waste water discharges.

NATIONAL ENVIRONMENTAL ENFORCEMENT

- Conducting over 2,000 audits and inspections of EPA licensed facilities every year.
- Overseeing local authorities' environmental protection responsibilities in the areas of - air, noise, waste, waste-water and water quality.
- Working with local authorities and the Gardaí to stamp out illegal waste activity by co-ordinating a national enforcement network, targeting offenders, conducting investigations and overseeing remediation.
- Prosecuting those who flout environmental law and damage the environment as a result of their actions.

MONITORING, ANALYSING AND REPORTING ON THE ENVIRONMENT

- Monitoring air quality and the quality of rivers, lakes, tidal waters and ground waters; measuring water levels and river flows.
- Independent reporting to inform decision making by national and local government.

REGULATING IRELAND'S GREENHOUSE GAS EMISSIONS

- Quantifying Ireland's emissions of greenhouse gases in the context of our Kyoto commitments.
- Implementing the Emissions Trading Directive, involving over 100 companies who are major generators of carbon dioxide in Ireland.

ENVIRONMENTAL RESEARCH AND DEVELOPMENT

- Co-ordinating research on environmental issues (including air and water quality, climate change, biodiversity, environmental technologies).

STRATEGIC ENVIRONMENTAL ASSESSMENT

- Assessing the impact of plans and programmes on the Irish environment (such as waste management and development plans).

ENVIRONMENTAL PLANNING, EDUCATION AND GUIDANCE

- Providing guidance to the public and to industry on various environmental topics (including licence applications, waste prevention and environmental regulations).
- Generating greater environmental awareness (through environmental television programmes and primary and secondary schools' resource packs).

PROACTIVE WASTE MANAGEMENT

- Promoting waste prevention and minimisation projects through the co-ordination of the National Waste Prevention Programme, including input into the implementation of Producer Responsibility Initiatives.
- Enforcing Regulations such as Waste Electrical and Electronic Equipment (WEEE) and Restriction of Hazardous Substances (RoHS) and substances that deplete the ozone layer.
- Developing a National Hazardous Waste Management Plan to prevent and manage hazardous waste.

MANAGEMENT AND STRUCTURE OF THE EPA

The organisation is managed by a full time Board, consisting of a Director General and four Directors.

The work of the EPA is carried out across four offices:

- Office of Climate, Licensing and Resource Use
- Office of Environmental Enforcement
- Office of Environmental Assessment
- Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet several times a year to discuss issues of concern and offer advice to the Board.

National Waste Report 2010

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LIST OF TERMS

This list of terms is intended to assist understanding of this report, and does not purport to be a legal interpretation of said terms.

An **Annual Environmental Report (AER)** must be submitted to the EPA each year by companies with either waste or Integrated Pollution Prevention Control licences, providing summary information on all aspects of the environmental performance of the licensed facility e.g. data on emissions to air and water, waste management, resource consumption, objectives and targets, ambient monitoring and complaints. AERs are made publicly available on the EPA website. Waste collection permit (WCP) and waste permit (WP) holders are required to submit AERs to local authorities under condition of permit.

2-bin or 3-bin system refers to a source segregated collection system where dry recyclables and residual wastes are separately collected (2-bin system), or where dry recyclables, organics and residuals are separately collected (3-bin system). The reference to **'black bin'** in this document is a reference to a single bin collection or to the residuals bin from a 2-bin or 3-bin system. The reference to **'green bin'** in this document is a reference to a dry recyclables collection, and **'brown bin'** is a reference to an organics bin collection.

Biodegradable (in the context of waste) means waste that is capable of undergoing anaerobic or aerobic biological decomposition, such as food and garden waste, paper and cardboard etc.

Biodegradable municipal waste (BMW) means the biodegradable component of municipal waste, and does not include biostabilised waste. Biodegradable municipal waste is typically composed of food and garden waste, wood, paper, cardboard and textiles.

Biostabilised residual waste means residual BMW that has been treated to achieve an EPA approved biodegradability stability standard[1] prior to landfilling or alternative agreed use.

Biowaste under the terms of the Waste Framework Directive (2008/98/EC) means biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants.

c. (circa) - approximately.

Commercial waste, in the context of this report, is a term used to describe the non-household fraction of municipal waste, which is produced by commercial premises such as shops, offices and restaurants, as well as municipal premises such as schools, hospitals etc. It also includes non-process industrial waste arising from factory canteens, offices etc. Commercial waste is broadly similar in composition to household waste, consisting of a mixture of paper and cardboard, plastics, organics, metal and glass.

Construction and demolition (C&D) waste is all waste that arises from construction and demolition activities (including excavated soil from contaminated sites). These wastes are listed in Chapter 17 of the European Waste Catalogue (EWC).

CSO – the Central Statistics Office.

DECLG – the Department of the Environment, Community and Local Government.

Disposal means any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive (Directive 2008/98/EC) sets out a non-exhaustive list of disposal operations.

EEE is electrical and electronic equipment.

[1] http://www.epa.ie/downloads/pubs/research/waste/name,26127,en.html

End of Life Vehicle (ELV) means a vehicle which is waste within the meaning of Article 1(a) of the Waste Directive (refer to Directive 2000/53/EC on end-of life vehicles).

EPA – the Environmental Protection Agency.

ESRI – the Economic and Social Research Institute.

EU - European Union.

European Waste Catalogue (EWC), now known as the List of Wastes (LoW), is a list of all waste types generated in the EU. The different types of waste are fully defined by a six-digit code, with two digits each for chapter, sub-chapter and waste type. The catalogue is available for download from the EPA website at www.epa.ie/downloads/pubs/waste/stats/EPA_waste_catalogue_hazard_list_2002.pdf.

Gross Domestic Product (GDP) & **GNP (Gross National Product).** Gross Domestic Product (GDP) and Gross National Product (GNP) are closely related macroeconomic parameters. GDP measures the total output of the economy in a period i.e. the value of work done by employees, companies and self-employed persons. This work generates incomes but not all of the incomes earned in the economy remain the property of residents (and residents may earn some income abroad). The total income remaining with Irish residents is the GNP and it differs from GDP by the net amount of incomes sent to or received from abroad.

Hazardous wastes are wastes that have the potential to cause harm to human health or the environment. Any waste which displays one or more of the hazardous properties listed in Annex III of the Waste Framework Directive (2008/98/EC) is defined as hazardous waste.

Household waste is defined as waste produced within the curtilage of a building/residence or self-contained part of a building/premises used for the purposes of living accommodation.

Industrial waste is waste produced by industrial activity such as that of factories, mills and mines. Non-process industrial waste (e.g. from site canteen, office, etc.) is similar in character to commercial waste.

Inert waste is 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.

An **Integrated Pollution Prevention and Control (IPPC)** licence is an authorisation issued and enforced by the EPA for specific industrial and agricultural activities. An IPPC licence sets limits on air and water emissions, waste and noise and requires that an activity must use the Best Available Techniques (BAT).

An **Integrated Waste Management Facility (IWMF)** in the context of this report is one that combines a landfill and other waste infrastructure such as civic amenity site, transfer station, composting or other treatment facilities.

Kerbside collection is a common reference for the practice of collecting household or commercial waste directly from its source, often, though not necessarily, from the pavement or front door.

LCA Life Cycle Assessment.

LCT Life Cycle Thinking.

Mechanical-biological treatment (MBT) means the treatment of residual municipal waste (black bin) through a combination of manual and mechanical processing and biological stabilisation, in order to stabilise and reduce the mass of waste that requires disposal.

Merchant operator. A commercial operator that accepts waste from third parties for treatment (as opposed to an industrial activity with facilities for the treatment of waste arising from their own processes, such as on-site incineration).

Metric tonnes are expressed as 't' throughout this report. Mt = million tonnes.

MDR - Mixed dry recyclables.

MFSU - manufacture, formulation, supply and use.

Municipal solid waste (MSW) or **municipal waste** means household waste as well as commercial and other waste that, because of its nature or composition, is similar to household waste. It excludes municipal sludges and effluents. In the context of this report municipal waste consists of three main elements - household, commercial (including non-process industrial waste), and street cleansing waste (street sweepings, street bins and municipal parks and cemeteries maintenance waste, litter campaign material).

N/A – not applicable.

NACE - Nomenclature générale des activités économiques dans l`Union Européenne (general name for economic activities in the European Union).

NEC – not elsewhere classified.

NSAI – National Standards Authority of Ireland.

NTFSO – National Transfrontier Shipment Office, Dublin City Council.

NWCPO – National Waste Collection Permit Office, Offaly County Council.

OEA – Office of Environmental Assessment, Environmental Protection Agency.

OEE – Office of Environmental Enforcement, Environmental Protection Agency.

Organic waste is biodegradable food, garden and landscaping waste, and where the context permits, will also include industrial organic sludges (e.g. from the food and drink production sector).

Packaging is used to contain, protect and present goods. Virtually all packaging eventually becomes waste. Packaging is made from such materials as cardboard, paper, glass, plastic, steel, aluminium, wood, and composite materials such as those used in milk and juice cartons.

Pollutant Release and Transfer Register (PRTR) Regulations 2007. These Regulations require that releases of pollutants and off-site transfers of waste by facilities operating in relevant industrial sectors must be reported annually to the EPA. The EPA in turn reports this information to the European E-PRTR website.

Preparing for reuse means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be reused without any other pre-processing.

Recovery means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive (2008/98/EC) sets out a non-exhaustive list of recovery operations, which includes material recovery (i.e. recycling), energy recovery (i.e. use a fuel (other than in direct incineration) or other means to generate energy) and biological recovery (e.g. composting).

Recycling means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Refuse derived fuels (RDF) are fuels produced from waste through a number of different processes such as mechanical separation, blending and compressing to increase the calorific value of the waste. Such waste derived fuels can be comprised of paper, plastic and other combustible wastes and can be combusted in a waste-to-energy plant, cement kiln or industrial furnace.

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

Reuse means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

RoI – Republic of Ireland

SI (Statutory Instrument). An order, regulation, rule, scheme or bye-law made in exercise of a power conferred by statute.

Solid recovered fuels (SRF) means solid fuel prepared from non-hazardous waste to be utilised for energy recovery in incineration or co-incineration plants and meeting the classification and specification requirements laid down in EN 15359: 2011 Solid Recovered Fuels — Specifications and Classes, where 'prepared' means processed, homogenized and up-graded to a quality that can be traded among producers and users.

The **Transfrontier Shipment of Waste (TFS)** Regulations 2007 set out new notification procedures, revised waste listings and enforcement provisions in relation to the export, import and transit of waste shipments within the EU. The National TFS Office at Dublin City Council is the competent authority for the implementation and enforcement of the TFS Regulations since 12th July 2007.

Treatment/pre-treatment includes, in relation to waste, any manual, thermal, physical, chemical or biological processes that change the characteristics of waste in order to reduce its mass, or hazardous nature or otherwise, to facilitate its handling, disposal or recovery.

Waste is defined as any substance or object which the holder discards, intends to discard or is required to discard, under the Waste Framework Directive (2008/98/EC).

Waste management means the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker.

Waste producer means anyone whose activities produce waste (original waste producer) or anyone who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste, under the Waste Framework Directive (2008/98/EC).

Waste electrical and electronic equipment (WEEE) refers to electrical and electronic equipment which is waste within the meaning of Article 3(a) of the Waste Directive 2008/98/EC, including all components, subassemblies and consumables which are part of the product at the time of discarding.

Waste Framework Directive (WsFD) - Waste Directive 2008/98/EC of 19 November 2008.

WCP (Waste Collection Permit). A permit issued by a local authority for the collection of waste under the Waste Management (Collection Permit) Regulations 2007, as amended.

WP (Waste Permit). A permit issued by a local authority to a facility for the transfer, storage or treatment of waste under the Waste Management (Facility Permit and Registration) Regulations 2007, as amended.

EXECUTIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The Environmental Protection Agency's (EPA) National Waste Prevention Programme takes responsibility for producing national statistics on waste generation and management in the Republic of Ireland. The objective of this report is to present the most up to date information available on waste generation and management in Ireland, as reported to the EPA. This report is for the calendar year 2010 and deals with municipal solid wastes (household, commercial and local authority cleansing wastes), waste streams subject to producer responsibility initiatives (packaging, waste electrical and electronic equipment, end of life vehicles) as well as construction & demolition and hazardous wastes. Some of the key statistics and findings from the report are set out below.

Municipal waste

- A total of 2,846,115 t of municipal waste was generated, a decrease of 3.6% on 2009.
- Ireland's municipal waste recovery rate increased by 3% to yield an overall recovery rate of 42%.
- Ireland's municipal waste recycling rate (excluding energy recovery) is 38%, close to the EU27 norm of 40%.
- Municipal waste disposed to landfill was 1,495,565 t, a decrease of 13% from 2009.
- The UK remains the principal initial destination for Irish municipal waste recyclables.

Household waste

- Household waste managed decreased by 5% to 1,420,706 t despite a rise in population. The trend strongly reflects national personal consumption trends.
- The proportion of managed household waste recovered increased from 29.5% in 2009 to 40.6% in 2010.
- Household waste disposed to landfill decreased by 20% to 843,842 t. This represents 184 kg household waste disposed to landfill per person in the State.
- An estimated 29% of occupied houses did not avail of, or were not offered, a kerbside collection service (ranging from 2% to 63% across local authority areas). Allowing for local arrangements uncollected household waste is estimated at 265,681 t.
- The quantity of household waste collected at kerbside decreased by 4% in 2010.
- The private sector collected 65% of household kerbside waste (up from 60% in 2009 and 57% in 2008), reflecting the fact that local authorities are moving out of the household waste collection market.
- A 2-bin service (residual and mixed dry recyclable bin) was provided to 95% of serviced households (96% in 2009).
- A 3-bin service (residual, mixed dry recyclable and organic bin) was provided to 34% of serviced households (24% in 2009).

- A number of private sector operators introduced a fourth bin at household kerbside for the collection of glass in 2010 (4,188 t collected).

Biodegradable municipal waste

- Ireland has met the first EU Landfill Directive biodegradable municipal waste diversion target (due by July 2010), which was to landfill a maximum 75% of the biodegradable municipal waste generated in 1995.
- The estimate of home composting remained static at 36,855 t (36,733 t in 2009).
- The quantity of biodegradable municipal waste disposed at landfill decreased by 19% from 2009 to 860,000 t.
- Of the estimated 1,817,983 t of biodegradable municipal waste available, 47% was consigned to landfill (down from 55% in 2009), and 53% was recovered.
- The separate kerbside collection of household organic waste (in 3-bin service) increased marginally from 62,447 t in 2009 to 63,836 t in 2010 despite a greater penetration of the organic bin collection service.
- Householders in six of the thirty-four local authority functional areas weren't offered a 3-bin kerbside collection service (although this is down from eleven areas without the service in 2009).

Commercial waste

- The quantity of commercial waste managed dropped by 12% on 2009 figures.
- Commercial waste recovery decreased from 51% in 2009 to 45% in 2010.
- Commercial waste disposed to landfill was 633,010 t, a decrease of 1% from 2009.

Producer responsibility initiative waste streams

- A recovery rate of 74% is reported for packaging waste (up from 70% in 2009), exceeding the EU target of 60% recovery due in 2011.
- A total of 45,012 t of waste electrical and electronic equipment (WEEE) was collected for recovery (marginally down from 45,327 t in 2009). More than 8 kg per person of household WEEE was collected, exceeding the 4 kg per person EU target. The recovery rates for all categories of WEEE have also been achieved.
- Ireland is failing to meet the end of life vehicle (ELV) Directive targets which have been effective since January 2006. In 2009 a reuse/recovery rate of 82% and a reuse/recycling rate of 79% was achieved against targets of 85% and 80% respectively. Preliminary data for 2010 indicate that the reuse/recovery and reuse/recycling rates decreased in reference to the 2009 figures.
- Ireland is on track to meet the first Batteries Directive collection rate target, due December 2011. There was a significant increase in the tonnage of lead acid batteries (20%) and other batteries (88%) exported for treatment in 2010 compared to 2009.

Construction and demolition waste

- There was a 50% decrease in the reported quantity of C&D waste managed by recovery and disposal facilities (2.6 Mt), compared with 2009 data.
- Contaminated soil (usually generated in land development/redevelopment projects) exported for treatment increased from 476 t in 2009 to 2,590 t in 2010, although the overall tonnage managed is still significantly down on pre-2009 data.

Hazardous waste

- Hazardous waste originated primarily from the pharmaceutical and chemical industries.
- The quantity of hazardous waste managed in 2010 decreased by <1% since 2009.
- There was a 3% increase in the quantity of hazardous waste treated on-site at EPA-licensed Integrated Pollution and Prevention Control facilities, compared to 2009 data.
- There was a 3% increase in the quantity of hazardous waste treated at EPA-licensed commercial hazardous waste treatment facilities, compared to 2009 data.
- There was a 5% decrease in the quantity of hazardous waste exported for treatment in 2010 compared to 2009.

Waste infrastructure

- A total of 28 active landfills accepted municipal waste for disposal in 2010.
- At the end of 2010 the remaining licensed national landfill capacity for municipal waste was c.18 Mt.
- At current fill rates, 15 of the existing municipal solid waste landfills will use up their consented capacity within 3 years.
- As a consequence of landfill distribution and closure, significant inter-regional movement of waste will need to be accommodated.
- Local authorities reported that there were 107 civic amenity sites and 1,922 bring banks in operation in 2010, compared to 107 and 1,962 respectively in 2009.
- Household waste brought to bring banks and civic amenity sites accounted for 20% of managed household waste, which emphasises the importance of this infrastructure and the need to support it.
- Ireland's first municipal waste incinerator commenced operations in October 2011.
- Twenty-four facilities (compost and anaerobic digestion facilities) accepted municipal organic wastes for recovery (compared to 21 in 2009); 11 accepted biodegradable kitchen and canteen waste for recovery (compared to 8 in 2009).
- Refuse Derived Fuel (RDF) manufacture from residual wastes increased significantly in 2010 to c. 94,174 t (up from c. 48,000 t in 2009). Seven waste operators reported producing RDF at their facilities in 2010; and one licensed facility in the State (Lagan Cement Limited) used this fuel as an alternative to fossil fuel combustion in 2010.

Progress towards national & EU obligations

Progress made towards meeting national and EU recycling, recovery and diversion targets arising from EU Directives and national waste strategies is presented in Tables 1A & 1B.

As is apparent from Table 1A, and with the exception of end of life vehicle targets, Ireland is well advanced towards achievement of most of its EU obligations across a broad range of waste legislation.

In relation to the achievement of national waste management targets, and notwithstanding the substantial improvement to 41% recovery of household waste, there remains a significant distance to the 2013 target for the diversion of this stream from landfill of 50% (Table 1B).

Of significance is the fact that Ireland is failing to meet the current targets under the End of Life Vehicle (ELV) Directive. The current targets are in place since January 2006, and there are higher targets coming into effect from January 2015. Urgent action is needed to increase reuse/recovery/recycling of ELV materials and DECLG are engaging with stakeholders in this regard.

Also of significant note is the progress between 2008 and 2010 with respect to the diversion of biodegradable municipal waste (BMW) from landfill. Ireland has met its first BMW diversion target (July to December 2010 inclusive) through a combination of factors including a drop in biodegradable waste consigned to landfill in 2010 (as a proportion of reduced tonnage of municipal waste landfilled), EPA licensing and enforcement activities at landfill sites, BMW commercial food waste diversion successes[2], and strong paper/card recovery figures. There are however much stricter BMW diversion targets in force for 2013 and 2016, which will be more difficult to achieve. For these two targets the indicator status therefore remains at risk. In 2010, the Government signalled its intention to put into effect an obligation on waste collectors to provide or arrange for the separate collection of household food waste, through the publication of draft regulations to this effect. Implementation of this obligation would contribute to increased diversion of household food waste from landfill. However, it is also imperative to ensure that the significant potential for further BMW diversion is achieved through use of residual waste or its derivatives as a fuel in waste to energy recovery facilities, and through biostabilisation of the fines generated at intermediary municipal waste treatment facilities.

[2] Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009),

Table 1A: Progress towards EU waste recycling, recovery and diversion targets

Directive	Title	Article	Targets		Current progress to target in Ireland (2010)	Indicator
			Target date	Specifics		
94/62/EC as amended	Packaging Directive	6(1)	31-12-2011	60% as a minimum by weight of packaging waste will be recovered or incinerated at waste incineration plants with energy recovery.	74%	Achieved
				55% as a minimum by weight of packaging waste will be recycled.	66%	Achieved
				No later than 31st December 2011 the following minimum recycling targets for materials contained in packaging waste will be attained:		
				(i) 60% by weight for glass;	78%	Achieved
				(ii) 60% by weight for paper and board;	84%	Achieved
				(iii) 50% by weight for metals;	63%	Achieved
				(iv) 22.5% by weight for plastics, counting exclusively material that is recycled back into plastics;	39%	Achieved
				(v) 15% by weight for wood.	83%	Achieved
2002/96/EC	WEEE Directive	5(5)	(31-12-2006) 31-12-2008[3]	Separate collection of > 4kg of WEEE from private households per person per year.	8 kg	Achieved
		7(2)		For large household appliances and automatic dispensers:- – recovery shall be increased to a minimum of 80% by an average weight per appliance; and – component, material and substance reuse and recycling shall be increased to a minimum of 75% by an average weight per appliance.	83% 80%	Achieved
				For IT, telecommunications and consumer equipment:- – the rate of recovery shall be increased to a minimum of 75% by an average weight per appliance; and – component, material and substance reuse and recycling shall be increased to a minimum of 65% by an average weight per appliance.	85% 83%	Achieved
				For small household appliances, lighting equipment, electrical & electronic tools, toys, leisure and sports equipment, monitoring and control instruments:- – the rate of recovery shall be increased to a minimum of 70% by an average weight per appliance; and – component, material and substance reuse and recycling shall be increased to a minimum of 50% by an average weight per appliance.	85% 83%	Achieved
				For gas discharge lamps, the rate of component, material and substance reuse and recycling shall reach a minimum of 80% by weight of the lamps.	91%	Achieved
2000/53/EC	End of Life Vehicles Directive	7(2)(a)	1-1-2006	Reuse and recovery to a minimum of 85% by average weight of vehicle and year.	78%[4]	Not achieved
				Reuse and recycling to a minimum of 80% by average weight of vehicle and year.	77%[4]	Not achieved
		7(2)(b)	1-1-2015	Reuse and recovery to a minimum of 95% by average weight of vehicle and year.	(78%)[4]	- Risk - Due January 2015
				Reuse and recycling to a minimum of 85% by average weight of vehicle and year.	(77%)[4]	- Risk - Due January 2015

[3] Ireland secured a two-year derogation.
[4] Based on preliminary 2010 data analysis. Up-to-date recycling and recovery information on depolluted ELV shells exported in 2010 was not available at the time of publication.

Directive	Title	Article	Targets		Current progress to target in Ireland (2010)	Indicator
			Target date	Specifics		
2006/66/EC	Batteries Directive	10(2)	31-12-11	Minimum 25% collection rate for batteries & accumulators.	14%	On Track[5] Due December 2011
			26-9-2016	Minimum 45% collection rate for batteries & accumulators.	(14%)	- Risk - Due September 2016
		12(4)	26-9-2011	Recycling processes shall achieve the following minimum recycling efficiencies:		
				(a) recycling of 65 % by average weight of lead-acid batteries and accumulators, including recycling of the lead content to the highest degree that is technically feasible while avoiding excessive costs;	Full data due in NWR 2011	To be reported to Commission in June 2012
				(b) recycling of 75 % by average weight of nickel-cadmium batteries and accumulators, including recycling of the cadmium content to the highest degree that is technically feasible while avoiding excessive costs; and		To be reported to Commission in June 2012
				(c) recycling of 50 % by average weight of other waste batteries and accumulators.		To be reported to Commission in June 2012
1999/31/EC	Landfill Directive	5(2)	(16-7-2006) 16-7-2010[6]	Biodegradable municipal waste going to landfills must be reduced to 75% of the total quantity (by weight) biodegradable municipal waste produced in 1995 (< 916,000 t)	860,000 t	Achieved
			(16-7-2009) 16-7-2013	Biodegradable municipal waste going to landfills must be reduced to 50% of the total quantity (by weight) biodegradable municipal waste produced in 1995 (< 610,000 t)	+ 250,000 t (estimate)[7]	- Risk - Due July 2013
			16-7-2016	Biodegradable municipal waste going to landfills must be reduced to 35% of the total quantity (by weight) biodegradable municipal waste produced in 1995 (427,000 t)	+ 433,000 t (estimate)[7]	- Risk - Due July 2016
2008/98/EC	Waste Framework Directive	11(2)(a)	12-12-2020	Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass *(includes metal and plastic estimates from household WEEE).*	53%	Achieved
		11(2)(b)	12-12-2020	Preparing for reuse, recycling and other material recovery (incl. beneficial backfilling operations using waste as a substitute) of 70% by weight of C&D waste (excluding natural soils & stone)	98%	Achieved
		29	12-12-2013	Establishment of a National Waste Prevention Programme (NWPP)	NWPP established in 2004	Achieved

[5] DECLG confirm that Ireland is on track to meet the 2011 EU target, despite the relatively low collection rate for 2010.
[6] Ireland secured a four-year derogation on first and second targets.
[7] Based on 2010 BMW to landfill, and assuming no increase in BMW to landfill (standstill).

Table 1B: Progress towards national waste management targets

Issue	Target	Source	Current progress (2010)	Indicator
Household waste	50% diversion from landfill of managed household waste by end 2013	Waste Management: Changing Our Ways (DECLG, 1998)	41%	- Risk -
Municipal waste	Recycling 35% of municipal waste by end 2013		38% (excluding energy recovery)	Achieved
Construction & demolition waste	Recycling 85% of C&D wastes by end 2013		98% (excluding energy recovery)	Achieved
Biodegradable waste	Recycling of municipal paper and card:	National Strategy on Biodegradable Waste (DECLG, 2006) (selected targets)		
	(i) 55% of that managed by end 2010		56%	Achieved
	(ii) 65% of that managed by end 2013		(56%)	On Track
	(iii) 67% of that managed by end 2016		(56%)	On Track
	Recovery of source separated municipal derived organic wastes (including home composting), as a proportion of biowaste content of MSW managed:			
	(i) 35% of that managed by end 2010		19%	Not achieved
	(ii) 43% of that managed by end 2013		(19%)	- Risk -
	(iii) 50% of that managed by end 2016		(19%)	- Risk -
Batteries	Achieve interim collection targets of waste portable batteries based on the quantity of portable batteries placed on the market in the State:	DECLG communication to EPA		
	(i) 15% by 26th September 2010		14%[8]	Not achieved
	(ii) 30% by 26th September 2014		(14%)	- Risk -

Future trends in waste management

Galway City Council, Kerry County Council (Killarney Town Council) and Waterford County Council are the only remaining local authorities in the household waste collection market at the time of publication of this report (in 2008 fifteen local authorities were in the household waste collection market). It is envisaged that local authorities will continue to exit the collection market as well as the operation of large infrastructure such as landfill.

It is anticipated that residual waste disposal in Ireland will concentrate to a small number of landfill sites, and the nature of the fill will likely evolve to become more mineral/inert in composition through more sophisticated pre-treatment technologies including waste to energy. It is envisaged that landfill levies, regulatory restrictions and resource value will continue to move waste away from disposal to recovery options. There is significant resource potential locked-up in former landfills. Based on the typical composition of residual municipal waste a potential 0.5 Mt of metal resource has been placed in landfills in the last twelve years. A new industry – *fill mining* - may develop in future years that will seek to harvest the resources and energy potential of closed landfills (sometimes referred to as urban mining). Such development would be subject to EPA licensing and planning authority development control authorisation.

[8] Based on information provided by the battery compliance schemes (WEEE Ireland and ERP Ireland) and verified by DECLG.

The significant growth in RDF/SRF production from residual waste will continue, with this material becoming traded as a commodity. It is envisaged that the number of anaerobic digestion plants in the State will increase, both to cater for the treatment of agricultural and municipal wastes.

Conclusions

The economic downturn is having a marked influence on municipal waste generation, which has decreased by 16% since it peaked in 2007. Household waste generation is decreasing in line with decreasing personal consumption and despite a population increase.

Ireland is well advanced with achievement of its EU recovery/recycling obligations in relation to many EU waste directives. Of significance however is that Ireland is failing to meet the End of Life Vehicle Directive reuse and recovery/recycling targets which have been in place since 2006 (with more stringent targets in place from January 2015). Urgent action is needed to increase reuse/recovery/recycling of ELV materials and DECLG are engaging with stakeholders in this regard.

The economic downturn (and consequent reduction in waste generation) has resulted in Ireland moving towards achievement of the EU Landfill Directive targets for biodegradable waste diversion. There remains some risk that Ireland will fail to meet the July 2013 and 2016 Landfill Directive targets for diversion of biodegradable municipal waste from landfill (a further 250,000 t of biodegradable municipal waste will need to be diverted from landfill in order to meet the 2013 target and 433,000t diverted to meet the 2016 target). In relation to achievement of nationally expressed waste management targets Ireland has been less successful.

The Economic and Social Research Institute predicted economic recovery scenarios for Ireland indicate that municipal solid waste will grow by c. 825,000 t (to 3.7 Mt) over the next fifteen years. Ireland remains underdeveloped with respect to the sophistication of essential waste infrastructure for the pre-treatment of municipal waste prior to disposal (e.g. anaerobic digestion, waste to energy, mechanical biological treatment etc.). It will be a challenge to meet waste diversion and waste recovery targets if municipal waste generation increases with economic recovery and the necessary waste infrastructure is not in place.

The EU Waste Framework Directive (2008/98/EC), transposed into Irish legislation by the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) will be a significant influence and driver of change in waste management practices and governance in Ireland and elsewhere over the coming decade, particularly with the legal obligation to ensure that waste is managed in accordance with the waste hierarchy (with prevention at the top).

Recommendations

In the coming years Ireland will move towards economic recovery, and through this a focus must remain in relation to the policies and actions necessary to decouple waste growth from economic growth. Waste prevention and not mere diversion must remain a priority. The need for businesses and State services to reduce costs in the current difficult economic and budgetary climate underlines the need for continued support for resource efficiency and conservation initiatives in relation to waste, water and energy, such as those provided under the EPA National Waste Prevention Programme, by the Sustainable Energy Authority of Ireland and Enterprise Ireland.

The diversion of very large quantities of biodegradable waste from landfill remains a priority that must be addressed, as does the improvement in recycling rates for municipal wastes. The amount of households not availing of or offered a waste collection service is significant and directly influences the large proportion of estimated uncollected municipal waste. State policy to require households to avail of a collection service will address some of the vulnerabilities in this respect.

The priority actions for biodegradable municipal waste management in Ireland for the foreseeable future are similar to those identified in previous National Waste Reports, and include the need to:

- Ensure there is adequate infrastructure to treat the very large quantities of organic (particularly food) waste that must be collected separately and diverted from landfill;
- Ensure there is adequate infrastructure for the bio-stabilisation of waste treatment residuals destined for landfill. Whilst much of the effort to date in relation to biodegradable waste has been around the source separation and treatment of the collected fraction, the waste characterisation surveys undertaken for the EPA demonstrate that a residual bin from a 3-bin collection service will still contain a considerable fraction of biodegradable materials (up to 47% for household collections). If Ireland is to meet the 2013 and 2016 EU Landfill Directive diversion targets, then infrastructure will have to be developed that will treat this residual fraction;
- Update and clarify national waste policy (e.g. households required to use organics bin). This will assist in providing certainty within the waste industry to better enable the accelerated investment programmes that are necessary if organic waste is to be treated and landfill avoided;
- Continue to promote food waste prevention through National Waste Prevention Programme initiatives such as StopFoodWaste.ie (www.stopfoodwaste.ie), Green Business and Green Hospitality Programme.

The importance of timely and accurate waste data from stakeholders in order to meet national and EU reporting obligations cannot be over-emphasised. There are legal obligations to record and report on waste management, therefore all stakeholders must ensure that sufficient resources are given to data management and reporting. Queries regarding household waste collection data from South Dublin County Council and Dun Laoghaire Rathdown County Councils remain open at the time of publication of this report, despite written requests. In addition, 2009 data on the number of households on a kerbside collection service was used for Wicklow County Council as a number of private sector operators failed to submit their 2010 Annual Environmental Returns.

Electronic reporting of environmental data has been rapidly evolving in recent years. There are well developed systems in place for exchange of water data between the EPA and local authorities, and this has improved efficiencies, timeliness and accuracy of data exchange. There have been a number of developments with regard to e-reporting of waste, e.g. by local authorities for waste collection permit holders (national waste collection data was available for 2010 for the first time, albeit from two separate reporting systems) and by the EPA for licensed activities (e-AER, Pollutant Release and Transfer Register). The EPA will support local authority developed systems providing they supply validated national data which will fulfil legislative reporting obligations. It is essential that there is co-operation with regard to the development and implementation of any

waste e-reporting systems (at a national level where possible) so that all data needs of the State are met, and to increase the efficiency of reporting for those waste operators subject to regulatory control.

Critical to the success of any e-reporting system is the data validation undertaken. The EPA recommends that all local authorities commit resources to the validation of the waste collection and waste facility datasets prior to submission to the EPA as the household waste collection and construction & demolition waste datasets are critical to national reporting.

For household waste collection data, the fact that many local authorities are exiting the collection market caused some issues with validation of 2010 data (risk of incorrectly counting number of households served and tonnages collected between services operated by local authorities and private sector operators). The EPA has provided feedback to local authorities so as to improve the validation of the 2011 dataset.

It would be extremely beneficial to have a statistically valid survey of household waste management behaviours (e.g. use of kerbside collection services versus bring centres, home composting information etc.), to assist in the implementation and evaluation of national waste policy. To this end, the EPA has submitted a proposal to CSO for the inclusion of a household waste module in the Quarterly National Household Survey.

1 INTRODUCTION

The EPA's National Waste Prevention Programme (NWPP) takes responsibility for producing national statistics on waste generation and management in the Republic of Ireland.[9] The objective of the National Waste Report (NWR) is to present the most up to date information available on waste management in Ireland, as reported to the EPA. The NWR reports annually on municipal waste, hazardous waste, construction & demolition waste and also particular waste streams subject to Producer Responsibility Initiatives (e.g. packaging, end of life vehicles). The data collected for the NWR series is also used to report to the EU Commission on various legislative reporting obligations such as EU Directives (packaging, waste electrical and electronic equipment, end of life vehicles), the Waste Statistics Regulation (2150/2002/EC as amended) and other reporting obligations such as the annual Structural Indicator on Municipal Waste.

Calendar year 2010 is a Waste Statistics Regulation data reporting year, and the NWR series usually publishes a chapter on industrial waste to coincide with this biennial reporting obligation. The EPA is currently compiling the dataset for 2010 waste generation data across all NACE economic sectors in the State and national waste generation and management data for 2010 will be available after the datasets have been submitted to the European Commission, post July 2012.

1.1 National Waste Report survey approach

This NWR presents waste data for the calendar year 2010. Waste data was sought from the following sources to collate the information presented:

- Local authorities;
- National Transfrontier Shipment Office;
- Licensed waste operators (landfills, hazardous waste treatment operators, composters etc.);
- Permitted waste operators (recovery organisations, such as metal handlers, authorised treatment facilities for end of life vehicles etc.);
- Integrated Pollution and Prevention Control activities;
- WEEE self-complying producers and WEEE and battery compliance schemes; and
- The national packaging compliance scheme.

The sources of all data cited are referenced throughout the report. The co-operation of all respondent organisations is gratefully acknowledged and this report could not be produced without the provision of timely and accurate data.

All survey returns were desk-top validated and 34 data verification audits were carried out, covering 5 local authority functional areas and 29 waste operators (including the larger municipal solid waste operators). Data reconciliation visits were completed with the WEEE and packaging compliance schemes. Each year the EPA

[9] More information at www.nwpp.ie.

provides training workshops on completion of the surveys, updates its online guidance manuals[10], and provides a helpline and dedicated e-mail address for waste operators.

The collection of waste generation and management data for the State continues to place a significant resource burden on the waste industry, local authorities, the EPA and others. The NWR is a key national document that informs policy as well as private sector investment strategy and business planning. Moreover, the data collected under the NWR programme provides the data used to report under EU waste reporting requirements. The data therefore informs the EU as to whether Ireland is meeting (or not meeting) its targets under a variety of EU Directives and Regulations and could result in fines and penalties on the State should we fail to comply. In this regard, the importance of timely and accurate waste data from stakeholders in order to meet these reporting obligations cannot be over-stated. Indeed there are statutory obligations on respondents to provide this information to the EPA. It is recognised that there is room for national efficiencies in how waste data is collected and reported, particularly given the recent expansion in EU driven data obligations. For 2010 data, national waste collection data was collated electronically for the first time, via two systems (Dublin City Council's e-portal, and the 'eWCP', used by waste collection permit operators permitted by nominated authorities other than Dublin City Council). Such electronic reporting facilities yield efficiencies for operators, local authorities and the EPA. The EPA will continue to support such ventures, such as funding of a mirroring server which allows local authorities to view all national waste collection permit data, once they supply validated national data which will fulfil legislative reporting obligations. In addition, the EPA is seeking to eliminate multiple waste reporting requirements of its licensees, through installation of a single e-reporting system, and this will continue to be developed as resources allow.

It is an on-going difficulty to apportion mixed municipal waste categories consigned to final treatment into household and commercial waste stream categories. This shows major frailties with current practices in classification of the delivered municipal solid waste as applied at the gate of a landfill or a waste to energy facility. The complex municipal waste management chain from collection through processing and then to various recovery and disposal outlets is rendering the determination of the make-up of residual municipal waste to waste to energy or landfill a challenge for these operators (i.e. how much is household and how much commercial). Facility operators will have to improve their data recording if reliable national performance and reporting obligations are to be met.

The waste accounting method used in this and previous NWRs does not include material in transit or temporary storage as it is neither disposed nor recovered in the calendar year.

It should be noted that table totals appearing in this report may vary by +/- 1 tonne due to statistical rounding.

1.2 National developments and issues

The National Waste Report and waste data collection programme is informed by national and EU legislative and policy developments, as well as technical advancements in waste management. NWR 2009 gave a detailed account of national and international developments and issues which were topical at the time of publication (February 2011), and therefore covered issues relating to calendar year 2010. It is recommended that the reader also references the introduction to NWR 2009 if this topic is of particular interest. Some other key developments

[10] See www.wastesurvey.ie.

in waste management policy and practice since February 2011 are included in this section for information and to assist operators, policy development and infrastructural planning.

1.2.1 National waste policy

In August 2011 a policy consultation from the DECLG '*Towards a new National Waste Policy*' was published. It confirms the Government's position that waste prevention and resource efficiency are crucial elements of a platform for sustainable economic growth.

The policy consultation dealt with landfill levies, and the Minister for the Environment, Community and Local Government increased the landfill levy, using powers available under the Waste Management Acts. The Waste Management (Landfill Levy) Regulations 2011 (S.I. No. 434 of 2011) increased the landfill levy by €20 to €50 per tonne for each tonne of waste disposed at authorised and unauthorised landfill facilities, effective from 1st September 2011. The Environment (Miscellaneous Provisions) Act 2011 allows the Minister to raise the levy up to a maximum of €120 per tonne. This Act allows the Minister to raise the levy once in any one year and by no more than €50 at any one time. It is likely that the levy will increase to €65 per tonne from July 2012 and €75 per tonne from July 2013. Such increases are likely to significantly influence market behaviour for waste disposal to landfill.

The policy consultation also dealt with such matters as regulation or control of the collection market, obligation to participate in a collection service (for households), and extension of organic bin collections to households. The EPA has previously stated that regulation of the collection market (competition for the market) has a better chance of delivering universal collection services and higher recovery rates. In addition, an obligation by householders to participate in a collection service would improve closing the gap on estimated uncollected household waste (Section 3), and the roll-out of the third bin (organics) will contribute to achieving obligations under the Landfill Directive. The final 'waste policy' is expected to be published in early 2012.

1.2.2 Green Public Procurement

The national Green Public Procurement (GPP) policy area continues to develop with the publication in January 2012 of the Government's Action Plan on Green Public Procurement, *Green Tenders*[11]. This Action Plan is considered an intrinsic element of the National Recovery Plan whereby greening the economy is linked with growth and sustainability. Public procurement can shape production and consumption trends and generate significant demand for more resource efficient, less wasteful and more sustainable 'greener' goods.

1.2.3 Transposition of the Waste Framework Directive 2008/98/EC

In March 2011 the revised EU Waste Directive (2008/98/EC) was transposed into Irish law by the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) (the Transposition Regulations). In terms of waste management generally this is a hugely significant piece of legislation which introduces many new obligations for public and private sector waste operations as well as for regulatory activities.

The waste hierarchy (Figure 1) is, for the first time in national statute, legally established. Waste prevention is stated as representing the highest priority for policy makers, waste producers and regulatory authorities. The legislation states that the hierarchy 'shall apply as a priority', and that competent bodies are to encourage production and waste management options that deliver the best overall outcome. In relation to the production

[11] http://www.environ.ie/en/Environment/SustainableDevelopment/GreenPublicProcurement/PublicationsDocuments/FileDownLoad,29208,en.pdf

aspect, Life Cycle Thinking[12] is introduced as a decision support framework. Life Cycle Thinking is a thought or decision process that seeks to identify improvements and to lower the negative environmental impacts of a good or service at all stages across its life cycle (design — raw material sourcing — manufacture — distribution — use — post-use (disposal/recovery) phases).

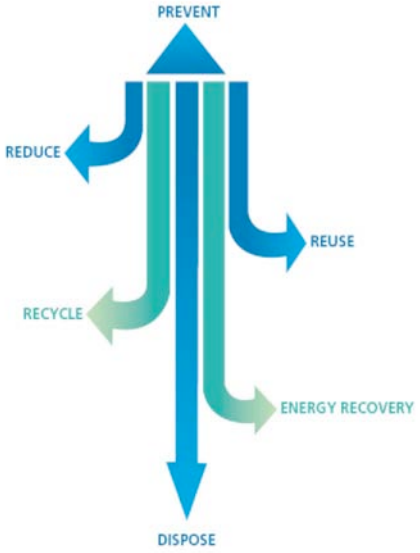


Figure 1: Waste hierarchy

The Transposition Regulations also detail clear responsibilities for waste producers and holders. Namely, it is a duty to ensure recovery in accordance with the hierarchy (with prevention at the top), and it is an offence not to. Moreover there is a responsibility on waste producers to treat waste or have it treated in accordance with the hierarchy. The legislation states that the cost of waste management shall be borne by the original waste producer or by current or previous holders. The Regulations provide a framework for decision makers to consider a by-product of a production process a resource rather than a waste. This regulatory relief will be of significant advantage to production activities wishing to find alternative acceptable uses for production residues and for some production activities wishing to source secondary raw materials. Any intervention that sees a material diverted from the waste stream to an acceptable and safe form of economic utility is contributing to waste prevention success.

It is not possible herein to detail the full extent of the new Transposition Regulations, suffice to say that these legal provisions should have a significant impact on waste producers and waste management practices in Ireland, including waste prevention measures.

1.2.4 National Hazardous Waste Management Plan

The National Hazardous Waste Management Plan (NHWMP) 2008-2012 was published by the EPA in 2008.[13] The NHWMP is a strategic level document designed to provide overall direction to decision and policy makers involved in the prevention and management of hazardous waste. Recommendations for implementation are made for a number of public organisations, who were consulted during the preparation of the Plan. Objectives, Indicators and Targets for the Plan and Strategic Environmental Assessment (SEA) purposes are identified. Local authorities are obliged to take these recommendations into account when they review their operational regional and local area waste management plans.

In June 2011 the EPA circulated a report on an interim review of the NHWMP for comment. One of the review report's purposes is to monitor (in accordance with the SEA Regulations) if any significant effects have arisen from implementation of the Plan to enable remedial action to be taken early where unforeseen adverse effects occur. No unforeseen adverse effects have come to light as a result of the implementation of the Plan, according to the interim review.

[12] http://lct.jrc.ec.europa.eu/.
[13] See www.epa.ie/downloads/pubs/waste/haz.

A number of the NHWMP recommendations and projects are aimed specifically at reducing the levels of unreported hazardous waste by promoting more accessible collection points. Resources to implement these collections may become available from a range of recommended new Producer Responsibility Initiatives, if introduced. In tandem, the continued implementation of existing statutory Producer Responsibility Initiatives (such as waste electrical & electronic equipment, restriction of hazardous substances, batteries, packaging essential requirements, solvents, deco-paints and end of life vehicles) should help reduce the hazardous components of specified products and also assist with the collection/reduction of unreported hazardous waste. Similarly, implementation of regulations in relation to Persistent Organic Pollutants (POPs) and Polychlorinated Bi-phenyls (PCBs) will increasingly eliminate these hazardous substances and wastes. The co-operation of all relevant economic players is important if this objective of the NHWMP is to be accomplished.

Other projects pursued by the EPA in relation to unreported hazardous waste include the draft Farm Hazardous Waste Study, dissemination of the Garages Best Practice Guidance and the Code of Practice for Civic Amenity Sites. Contact is made on a continuing basis with all relevant stakeholders to promote the implementation of the findings from these projects.

Striving for more self-sufficiency nationally in the management of Ireland's hazardous waste, where technically and economically feasible, is a guiding principal behind many of the Plan's recommendations. Projects pursued by the EPA to promote greater self-sufficiency include completing the National Difficult Waste Facility Study (incorporating hazardous waste landfill) and the Economic Study of Solvent Recycling and Treatment in the Pharmachemical Sector in Ireland.

While the EPA can promote best practice and engage in a variety of projects to promote the Plan and SEA objectives, much responsibility rests with the producers and holders of hazardous waste. Many of their decisions will, ultimately, be driven by economic considerations. Similarly, while the EPA can provide data and reports in relation to hazardous waste, the provision of indigenous hazardous waste treatment facilities and service is driven primarily by economic and specific policy decisions outside its control. As an environmental regulator, the EPA has itself no function in the provision of either services or physical infrastructure for hazardous waste.

The next NHWMP is due to commence in 2013. It is envisaged that the EPA will develop a draft replacement Plan early in 2012 for public consultation in line with the Waste Framework Directive and associated Irish Regulations.

The NHWMP and Interim review of the NHWMP is available at http://www.epa.ie/whatwedo/resource/hazardous.

1.2.5 The EPA National Waste Prevention Programme (NWPP)

From the perspective of the National Waste Prevention Programme, perhaps the most significant recent legal change was the introduction of a new Section 27A to the Waste Management Acts 1996-2011 (via Regulation 13 of the Waste Directive Transposition Regulations discussed above) which for the first time makes it a legal obligation to prepare waste prevention programmes. The EPA is now the competent authority to establish these programmes which have to be in place by 12th December 2013, and shall be revised at least once every six years.

Key aspects of the legislative provisions are requirements to:

- Establish waste prevention objectives;
- Determine specific qualitative and quantitative benchmarks for monitoring and assessing progress of waste prevention measures;

- Adopt specific qualitative or quantitative targets and indicators as may be established by the European Commission;
- Consider additional specific qualitative or quantitative targets and indicators as may be appropriate.

These requirements will be considered in the context of a review of the current national Waste Prevention Plan[14] which runs until end of 2012, and the development of a subsequent plan.

1.2.6 Inter-Agency cooperation on waste policy

State supports and advice in the development and implementation of Resource Efficiency strategies are available to businesses and institutions from a range of agencies such as the EPA National Waste Prevention Programme, the Sustainable Energy Authority of Ireland, Enterprise Ireland and IDA Ireland. The EPA works closely with these State agencies to promote and support sustainable enterprise attitudes and behaviours within organisations. It is this close working relationship that in 2011 yielded the *Green Enterprise Guide*[15] which represents the coming together of five State agencies to produce a valuable business resource for private and public enterprises. The main aim was to provide in one document a brief introduction to the economic and operational benefits of Resource Efficiency for businesses, and to present an overview and directional information to the supports and services offered by the four principal agencies in the State active in this policy area.

1.2.7 National Waste Collection Permit Office (NWCPO)

The responsibility for issuing all waste collection permits in the State is the responsibility of the National Waste Collection Permit Office (NWPCO), operated by Offaly County Council, from 1st February 2012. Prior to this, there were ten nominated authorities in the State that had responsibility for issuing waste collection permits. From 1st February 2012, all new permit and permit review applications will be dealt with by NWPCO. It is anticipated that the consolidation of this role into one office will lead to efficiencies for local authorities, operators and other regulators such as the EPA.

1.3 EU developments and obligations

In 2010 and 2011 a number of very significant documents were published by the EU Commission which are directly or indirectly related to the waste and resource efficiency agenda. These lay out a clear policy programme that places resource efficiency (including waste prevention) at the heart of sustainable development and economic recovery (Green Growth). These policy documents will form the principal thinking behind, and content of, the forthcoming review of the National Waste Prevention strategy.

1.3.1 EU Commission 2020 Strategy

The EU 2020 Strategy (COM(2010)2020) for *Smart, Sustainable and Inclusive Growth* was published in March 2010. It presents three mutually reinforcing priorities, one being Sustainable Growth, which is to be gained through promotion of a more resource efficient, greener and more competitive economy. This ambition, it is suggested, will help the EU to prosper in a low-carbon, resource constrained world while preventing

[14] http://www.epa.ie/downloads/pubs/waste/prevention/Prevention%20Plan%202009-2012%20FINAL2.pdf
[15] http://www.epa.ie/downloads/pubs/other/corporate/Developing%20a%20Green%20Enterprise%20Navigator.pdf

environmental degradation, biodiversity loss and unsustainable use of resources: the stated aim being, inter alia, to decouple economic growth from unsustainable resources and energy use. This strategy proposes the development of a number of 'flagship' initiatives to catalyse progress under the priorities. The 'flagship' proposal for a resource-efficient Europe was published in January 2011 (see 1.3.3 below).

1.3.2 Commission Communication on Prevention & Recycling (2011)

The Thematic Strategy on the Prevention and Recycling of Waste adopted in 2005 (COM(2005)0666)[16] sets a long-term goal for the EU that it should become a recycling society that seeks to avoid waste and which uses waste as a resource. The strategy expected more and better recycling, less waste to landfill and more compost and energy recovery from waste, leading to significant environmental, social and economic benefits. In January 2011 the Commission published a review of progress towards achieving the strategy objectives (COM(2011)13)[17]. The review states that, with continued growth of the world population combined with stronger emerging economies, total consumption is expected to increase significantly. This in turn will lead to pressure on resources and waste generation. Indeed it predicts that waste generation in the EU will increase by 7% between 2008 and 2020.

The Commission document signposts the development of initiatives that will yield more consistency between waste and product design policies, including considering rules on the uptake of minimum content of recycled materials in priority products, the recyclability and durability of products and reducing the use of hazardous substances. In particular the Commission states it will take concrete steps to move towards an EU resource efficient recycling society.

1.3.3 Flagship Initiative for a Resource Efficient Europe

In January 2011 the EU Commission published the Resource Efficiency Flagship Communication (Com(2011)21). The Commission identifies three conditions deemed necessary to Resource Efficiency:

- Coordinated policy action;
- Urgent action (due to long investment lead-times);
- Empowering consumers to move to resource-efficient consumption thereby driving continuous innovation.

The flagship initiative is reported as aiming to create a policy to support the shift towards a resource efficient low carbon economy, which in turn is stated as helping Europe to:

- Boost economic performance while reducing resource use;
- Identify and create opportunities for economic growth and greater innovation and boost the EU's competitiveness;
- Ensure security of supply of essential resources;
- Fight against climate change and limit the environmental impacts of resource use.

Changing consumption and production behaviours are considered central to the resource efficiency challenge, as is the need to consider the whole life-cycle of resource use. The implementation of the resource efficiency and waste prevention aspects of the EU Waste Framework Directive (2008/98/EC) are cited as important policy

[16] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0666:FIN:EN:PDF
[17] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0013:FIN:EN:PDF

interventions. The Commission state that they are working to ensure that appropriate indicators are developed for resources use and efficiency.

In September 2011 the Commission published a related document '*The Roadmap to a Resource Efficient Europe'* (COM(2011)571 final) (the Roadmap). This document defines medium and long-term objectives and means needed to achieve them. The Roadmap document is very rich in policy informing content. It provides a good basis for further discussion among Member States, the EU Commission and all key stakeholders to progress resource efficiency agenda; moreover it also specifies matters that Member States should consider. These statements should inform national policy making for the next 10 to 15 years. The forthcoming 7th Environmental Action Plan will be an important support for any resource efficiency policy measures stemming from the Roadmap.

1.3.4 Raw Materials Strategy

Resource efficiency ambitions can be seen across the breadth of the Commission's policy agenda. One of those agenda areas is the critically important Raw Materials Initiative (COM(2008)699)[18] which envisions the need for three policy pillars:- ensuring a level playing field in access to resources in third countries; fostering sustainable supply from EU sources; and boosting resource efficiency and promoting recycling. Arising from this initiative the Commission developed a policy communication on '*Tackling the Challenges in Commodity Markets and on Raw Materials*' (COM(2011)25[19] - the Raw Materials Strategy) published in February 2011. The Commission considers a resource efficiency policy 'pillar' as central to a sustainable raw material strategy (adopted from Pillar 3 of the Raw Materials Initiative); this to include 'urban mining' where greater extraction of secondary raw materials from waste is seen as underexploited, as well as maximising efficiency of resources use, examining the recyclability and durability of products and eco-design.

[18] http://ec.europa.eu/enterprise/sectors/metals-minerals/files/com699_en.pdf
[19] http://ec.europa.eu/enterprise/policies/raw-materials/

2 GENERATION OF MUNICIPAL WASTE

2.1 Quantities and trends

In the context of this report municipal waste consists of three main elements (i) household (ii) commercial (including non-process industrial waste) and (iii) street cleansing waste (street sweepings, street bins and municipal parks and cemeteries maintenance waste, litter campaign material).

In 2010, it is estimated that a total of 2,846,115 t of municipal waste was generated in Ireland, a decrease of 3.6% on the 2009 figures (Table 2 and Figure 2), and continuing the downward trend in waste generation since it peaked in 2007.

The data for household waste generation includes estimates for uncollected household waste (265,681 t; refer to Section 3.3.4). A distinction is therefore drawn between municipal waste *generated* and municipal waste *managed* – the latter concerning itself only with municipal waste that is either collected or brought directly to waste facilities or home composted. An analysis of the main components of the managed household and commercial municipal streams is discussed in Sections 3.3 and 3.4 of this report.

Table 2: Municipal waste generation, 2005–2010

	2005	2006	2007	2008	2009	2010
Household waste (t)	1,746,408	1,978,716	1,761,167	1,677,338	1,626,469	1,686,387
Commercial waste (t)	1,235,629	1,327,068	1,549,075	1,477,397	1,299,807	1,141,015
Cleansing waste (t)	(58,677)	(78,822)	(87,441)	(69,546)	26,701	18,713
Total municipal waste (t)	**3,040,714**	**3,384,606**	**3,397,683**	**3,224,281**	**2,952,977**	**2,846,115**
% change	1.3	11.3	0.4	-5.1	-8.4	-3.6%

(Source: Recovery organisations survey; landfill survey, local authority survey)

Cleansing waste comprises street sweepings, the content of municipal bins, parks and gardens waste. Fly-tipped material has been assigned to either commercial or household waste categories depending on description since 2009 and this explains the apparent drop in tonnage of such material since then. Tracking this latter material over its full management cycle is challenging, as much of this waste is merged with collected household waste at waste transfer and treatment facilities. Apart from street sweepings (mixed litter and grit, water etc.), the remainder of this material has a similar character to household and commercial wastes and is accordingly indistinguishable. The municipal landfill section of this report (Section 10.1) identifies 18,713 t of street sweepings and parks maintenance waste disposed of at landfill in 2010, though more was likely collected and co-mingled with household and commercial streams for landfill.

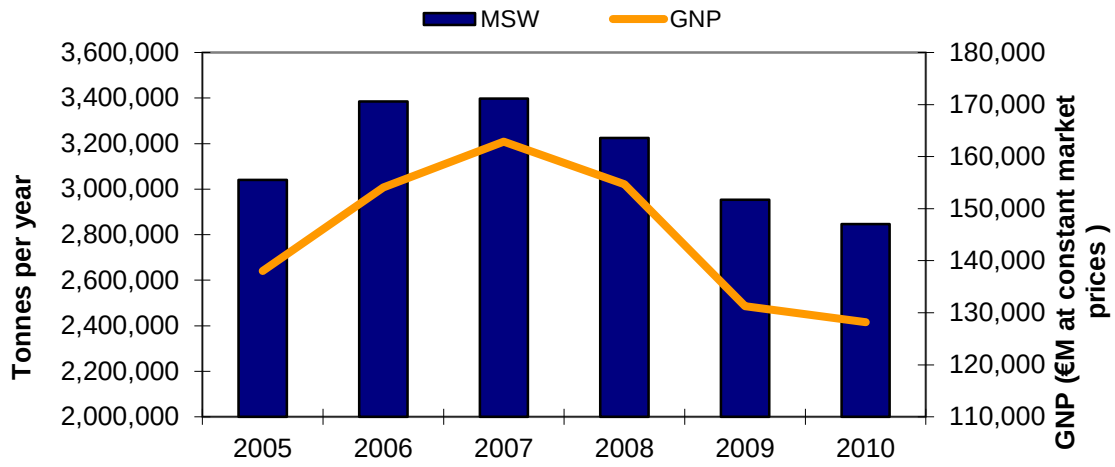


Figure 2: Trends in municipal waste generation and GNP, 2005-2010[20]

Figure 3 shows that there was a substantial drop in municipal waste generation in 2010 despite increasing population and a modest decrease in personal consumption (there was a more dramatic drop in person consumption and GNP between 2008 and 2009).

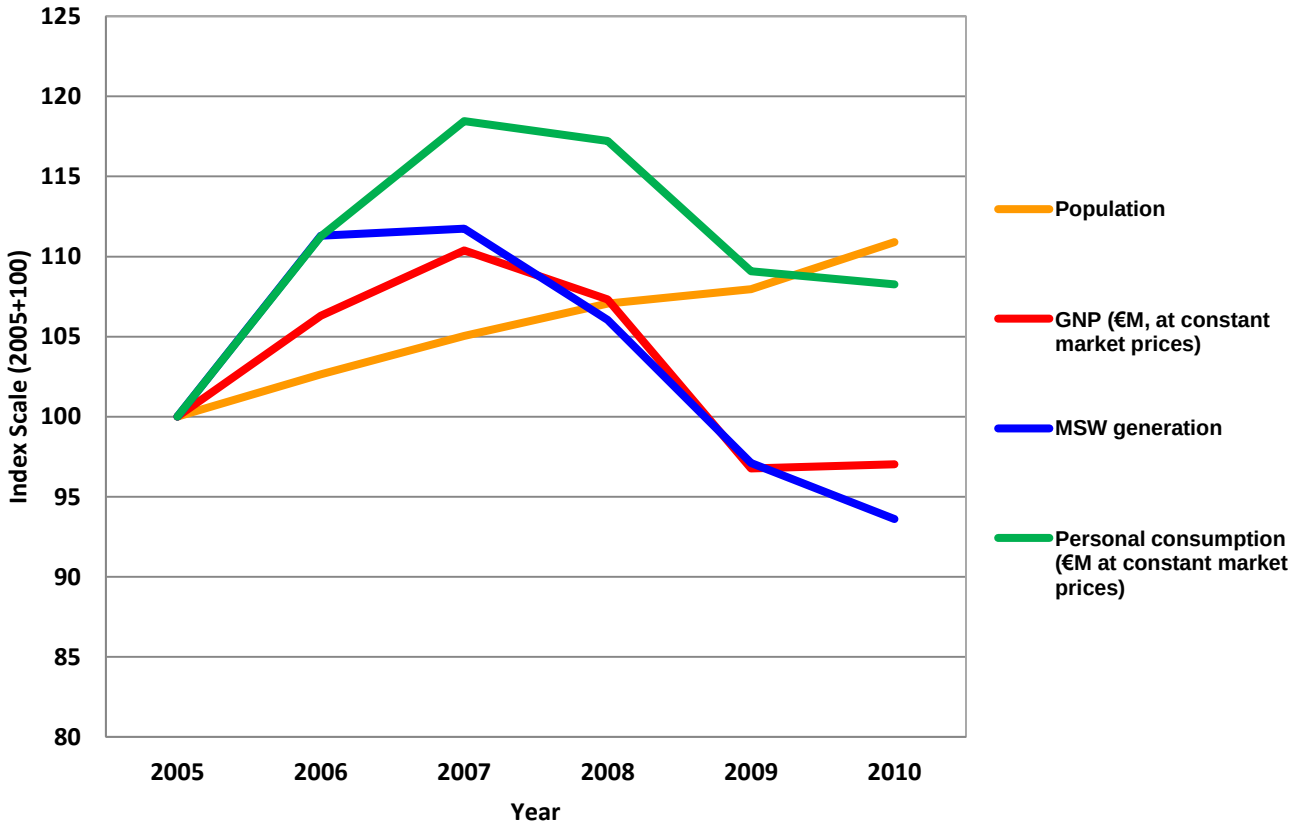


Figure 3: Trends in municipal waste generation, GNP, population and consumption, 2005-2010[21]

[20] CSO data on GNP.

[21] CSO data on population, GNP and personal consumption.

2.2 Forecast for municipal waste generation

The Economic and Social Research Institute (ESRI) was commissioned by the EPA STRIVE research programme to design and build a Sustainable Development Model for Ireland (ISus)[22] that will forecast national environmental emissions and resource use up to 2025, having regard to economic and social developments. The ISus model is driven by the ERSI's HERMES model, which projects economic production and consumption per sector.

The tonnage of future streams of municipal waste is intricately linked to the performance of the economy and its ability to move out of recession. Using the ISus model, it is possible to project future tonnages of municipal waste generation for the period up to 2025 depending on the economic recovery possibilities.

The ISus model predicts a reduction in the growth rate (-0.8%) in 2011, and a growth rate not exceeding 1% per annum until 2015 and beyond. Using this model, it is anticipated that the total tonnage of municipal waste generated will increase by c. 825,000 t within the next 15 years (Figure 4).

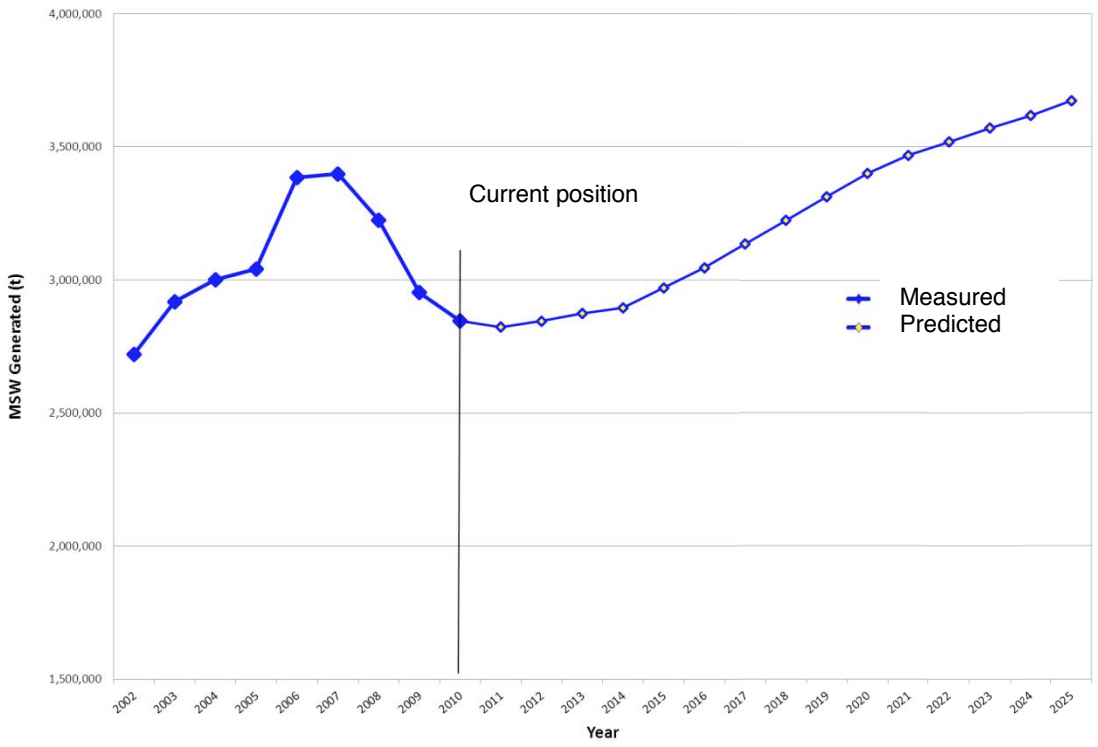


Figure 4: Predicted growth in municipal waste generation (ISus model)[22]

While there may be sufficient management capacity in the immediate future, the predicted growth of municipal waste within the coming decade will necessitate investment in waste management infrastructure. In the coming years it will be important that waste prevention, resource conservation, and eco-design programmes become embedded, so as to assist in the decoupling of waste generation in Ireland from any future economic growth.

[22] For further information on the ISus model see www.esri.ie/research/research_areas/environment/isus/

3 MANAGEMENT OF MUNICIPAL WASTE

3.1 Quantities and trends

The quantity of municipal waste managed in 2010 (2,580,435 t) indicates a 9% reduction on that managed in 2009 (2,824,977 t). Disposal and recovery rates for the managed municipal waste streams are shown in Table 3 and Figure 5. The quantity of municipal waste recovered in 2010 increased by 3% on that reported in 2009 (from 39% to 42%, as a proportion of waste generated), while the landfill of municipal waste decreased by a corresponding amount. The recovery rate continues to exceed the national target of 35% recycling by 2013. The total managed municipal waste arisings comprised 1,420,706 t of household wastes, 1,141,015 t of commercial wastes and 18,713 t of street cleansing wastes. The constituents of the commercial and household waste streams are examined in greater detail later in this section.

Figure 5 illustrates trends in the recovery and disposal of municipal waste, together with population growth between 2005 and 2010. The trends illustrated in Figure 5 (and Figure 3) show that since 2007 there is an overall decrease in municipal waste managed despite population growth.

Table 3: Disposal and recovery of managed municipal waste, 2010

Material	Quantity managed (t)[23]	Quantity disposed to landfill (t)	National landfill disposal rate (%)	Quantity recovered (t)	National recovery rate (%)
Total	**2,580,435**	**1,495,565**	**58**	**1,084,870**	**42**

(Source: Recovery organisations survey, local authority survey, landfill survey)

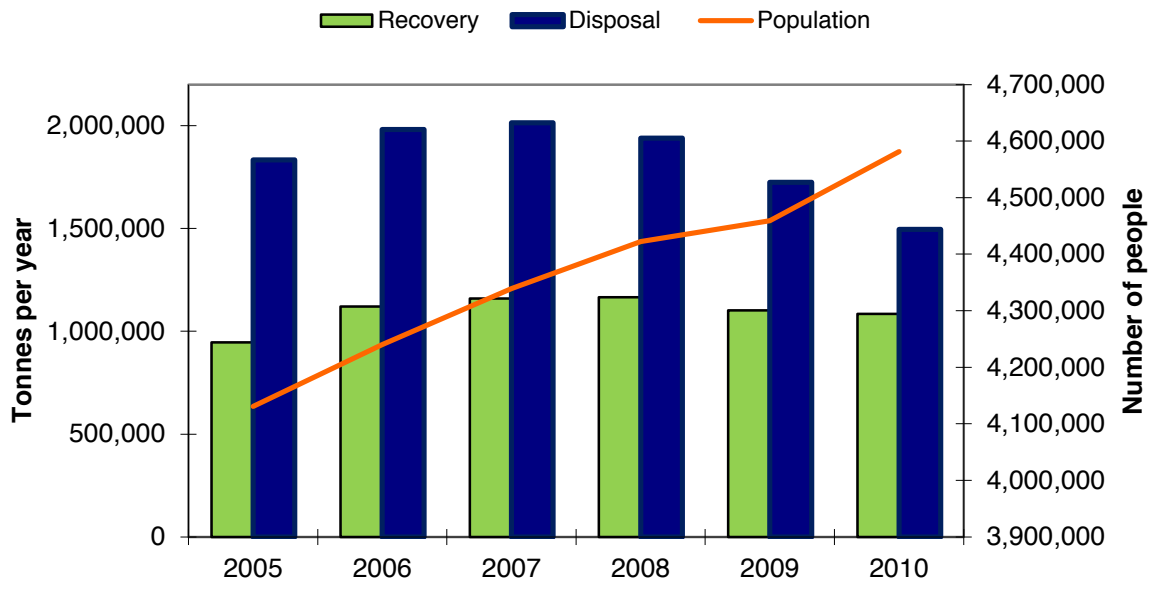


Figure 5: Trends in recovery and disposal of municipal waste, 2005–2010[24]

[23] This total doesn't include estimates of uncollected waste (265,681 t).

Although Ireland is still very dependent on landfill for residual waste disposal (58%), the improving recycling rate (i.e. energy recovery excluded) achieved (38%) is closing on the EU 27 average of 40%[25] (Figure 6).

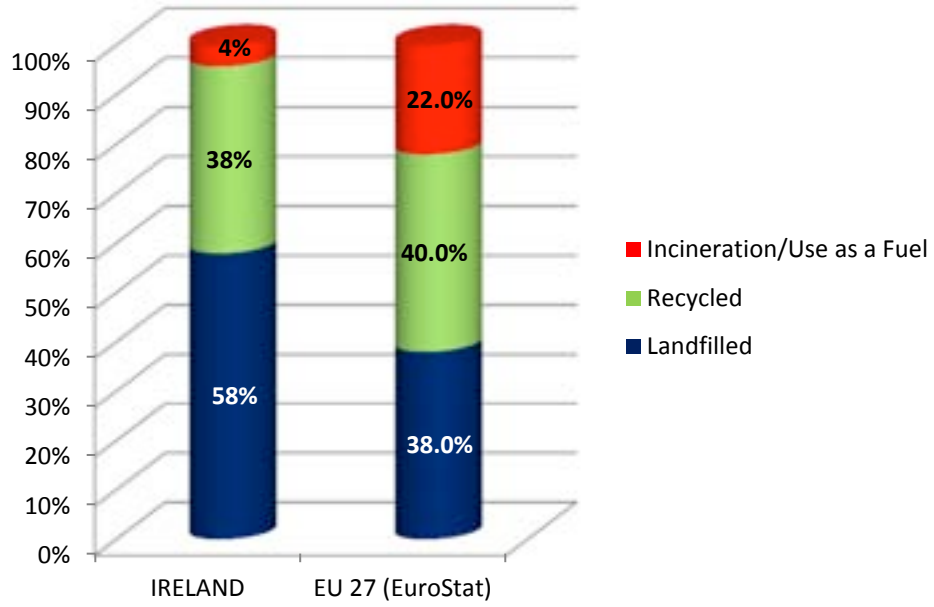


Figure 6: Management of Irish municipal waste for 2010 in comparison with EU 27 MSW

Table 4 presents the breakdown of the municipal disposal data for 2010 and calculates the market change since 2009, which is overall a decrease of 13% of municipal solid waste to landfill since 2009. Notably the household waste stream is down by 20% on 2009 figures, while the commercial waste stream disposed to landfill is only down by 1% on 2009 figures.

Table 4: Change in landfill disposal of municipal waste components between 2009 and 2010

	Household waste disposed to landfill (t)	Commercial waste disposed to landfill (including non-process industrial) (t)	Street sweepings disposed to landfill (t)	Total MSW disposed to landfill (t)
2009	1,056,267	640,737	26,701	1,723,705
2010	843,842	633,010	18,713	1,495,565[26]
% change	**-20%**	**-1%**	**-30%**	**-13%**

[24] 2010 population data from census 2011 preliminary data (CSO).
[25] http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-32-10-283/EN/KS-32-10-283-EN.PDF
[26] Not including 28,341 t of repatriated waste from historical illegal dumping in Northern Ireland, as this waste was not generated in 2010.

3.2 Municipal waste recovery

The following section presents information on recovery of the principal municipal waste streams managed in Ireland, using data provided by the recovery organisations surveyed. See Appendix I for additional information on non-hazardous wastes recovered (including non-municipal waste streams such as glass from end of life vehicles).

Table 5 shows that in 2010, approx. 23% of non-hazardous municipal waste recovery took place in Ireland. Most municipal wood and organic waste was recovered in the State in 2010 (>95%), while Ireland's substantial reliance on recovery of municipal recyclables abroad continues (Table 6), in particular for metals, paper and cardboard and glass, and to a lesser extent for plastic. The tonnage of Refuse Derived Fuel recovered in the State increased in 2010, although approx. 50% was sent abroad for recovery.

Table 5: Non-hazardous municipal waste recovered in Ireland, 2009 and 2010 (not including imports)

Material[27]	2009		2010	
	Recovered in Ireland (t)	% recovered in Ireland (compared to total recovery of each material)	Recovered in Ireland (t)	% recovered in Ireland (compared to total recovery of each material)
Wood	171,464	98.9	43,819[28]	99.8
Organic waste[29]	91,546	94.2	135,237	94.9
Refuse derived fuel[30]	36,642	76.6	45,948	48.8
Plastic	23,102	31.6	13,853	19.1
Glass	13,507	11.2	5,112	4.6
Paper and cardboard	5,269	1.0	4,919	0.9
Aluminium	17	0.4		
Non-ferrous metals			50	0.8
Total	**341,518**	**31.2**	**248,939**	**22.9**

(Source: Recovery organisations survey, landfill survey)

[27] All hazardous waste has been excluded from this table. See Section 9 for information on hazardous waste recovery.
[28] Wood pallets were not counted as municipal waste for 2010 data, this is the reason for the significant decrease between 2009 and 2010.
[29] Includes edible oils and fats.
[30] Used as a fuel.

Table 6: Non-hazardous municipal waste recovered abroad, 2009 and 2010 (not including imports)

Material[27]	2009		2010	
	Recovered abroad (t)	% recovered abroad (compared to total recovery of each material)	Recovered abroad (t)	% recovered abroad (compared to total recovery of each material)
Ferrous metals	51,772	100	79,879	100
Other[31]	14,206	100	564	100
Mixed metals	1,411	100	10,070	100
Non-ferrous metals			6,048	99.2
Aluminium	4,344	99.6		
Paper and cardboard	504,243	99.0	520,623	99.1
Glass	106,988	88.8	106,483	95.4
Plastic	49,943	68.4	58,758	80.9
Refuse derived fuel[30]	11,176	23.4	48,226	51.2
Organic waste[29]	5642	5.8	7,241	5.1
Wood	1,936	1.1	76	0.2
Total	**751,660**	**68.8**	**837,969**	**77.1**

(Source: Recovery organisations survey)

Some waste materials are also imported into the State for recovery (Table 7). In 2010, a total of 108,234 t of waste was reported as imported into Ireland by operators that we survey for the National Waste Report, comprising mainly plastic packaging (57%), non-ferrous metals (17%) and organic waste (14%).

Table 7: Import of non-hazardous waste for recovery, 2009 and 2010

Material imported for recovery[32]	2009 (t)	2010 (t)
Plastic	62,276	61,952
Non-ferrous metals	16	18,552
Organic waste[33]	2,017	15,272
Wood	4,487	8,012
Ferrous metals	3,168	3,574
Tyres	0	859
End of life vehicles	0	8
Paper and cardboard	1	6
Mixed metals	17,479	0
WEEE	236	0
Total	**89,680**	**108,234**

(Source: Recovery organisations surveys)

[31] Composites, mixed packaging.
[32] No hazardous waste imports included in this table. See Section 9 for information on hazardous waste imported for recovery. This table includes some tonnage of non-municipal wastes imported for recovery (e.g. C&D wood).
[33] Includes edible oils and fats.

Table 8 shows that the United Kingdom continues to be the principal initial destination for municipal recyclable waste (although a percentage of what is exported to the UK is subsequently bulked and sent outside the UK for treatment). A total of 520,623 t of paper and cardboard was exported in 2010 for recovery (an increase on 2009), although it is extremely difficult to report on the final country where actual recovery takes place as some recovery operators provided the final destination to the EPA, and others provided the next destination (which is pre-treatment only, e.g. bulking). A total of 106,483 t of glass was exported, 77% to the UK and 23% to Holland. A total of 95,997 t of municipal metal was exported in 2010, mainly to the UK (63%) and Spain and Portugal (23%).

Table 8: Destination of municipal non-hazardous recyclable waste streams exported in 2010

	Paper & cardboard (t)	Glass (t)	Metals (t)	Plastic (t)	Other (t)	RDF/SRF (t)	Edible oils & fats (t)	Wood (t)	Total (t)
UK[34]	139,175	81,894	60,520	35,187	113	52	7,194	76	342,211
China	161,147			13,543	41				174,730
Holland	127,673	24,589	11,652	2,053			45		166,011
Asia	43,538		940	4,460					48,938
India	37,398			65					37,463
Spain/ Portugal			22,352			10,027			32,379
Denmark						19,331			19,331
Sweden	476			23	460	14,484			15,443
Europe (unspecified)	8,615								8,615
Latvia						4,332			4,332
Belgium			232	1,691	31		1		1,955
Germany			167	1,736	1		1		1,906
Indonesia	1,806								1,806
France	551								551
Unknown			134						134
Italy					24				24
Total	**520,623**	**106,483**	**95,997**	**58,758**	**670**	**48,226**	**7,241**	**76**	**838,075**

(Source: Recovery organisations survey)

[34] UK totals include the following municipal wastes sent to Northern Ireland: 61,810 t glass; 5,441 t organic waste; 10,593 t plastic; 31,756 t paper & cardboard; 7,187 t textiles, 1,936 t wood and 12,672 t metals.

3.3 Household waste

3.3.1 Quantities and trends

The reported quantity of household waste managed (1,420,706 t) decreased by 5% from that reported for 2009 (Table 9). The quantity of household waste managed is taken as the quantity of waste reported as collected at kerbside and brought by householders to bring banks, civic amenity sites, WEEE brought to retailers and an estimate of home composted waste (reference Appendix B). The quantity of household waste disposed to landfill is known from the landfill surveys and the quantity recovered is the difference between the quantity collected/brought and disposed.

Of household waste managed in 2010, 77.7% was collected at kerbside, 19.7% brought to bring banks, civic amenity sites and directly to landfill and 2.6% is the estimate of home composting.

The quantity of household waste recovered increased by approximately 30% to 576,864 t, and when the fall in household waste managed is factored in, the net recovery rate (at 40.6%) represents an 11.1% increase on that achieved in 2009. Correspondingly, the proportion of managed household waste disposed to landfill fell to 59.4%. Disposal and recovery trends in household waste management are shown in Table 9 and Figure 7.

Table 9: Trends in household waste management, 2005 to 2010

	2005	2006	2007	2008	2009	2010
Quantity disposed to landfill (t)	1,198,504	1,379,246	1,200,980	1,155,567	1,056,267	843,842
Quantity recovered (t)	344,964	393,995	424,510	401,312	442,202	576,864
Recovery rate (%)	22.3	22.2	26.1	25.8	29.5	40.6
Total (t)	**1,543,468**	**1,773,242**	**1,625,490**	**1,556,879**	**1,498,469**	**1,420,706**

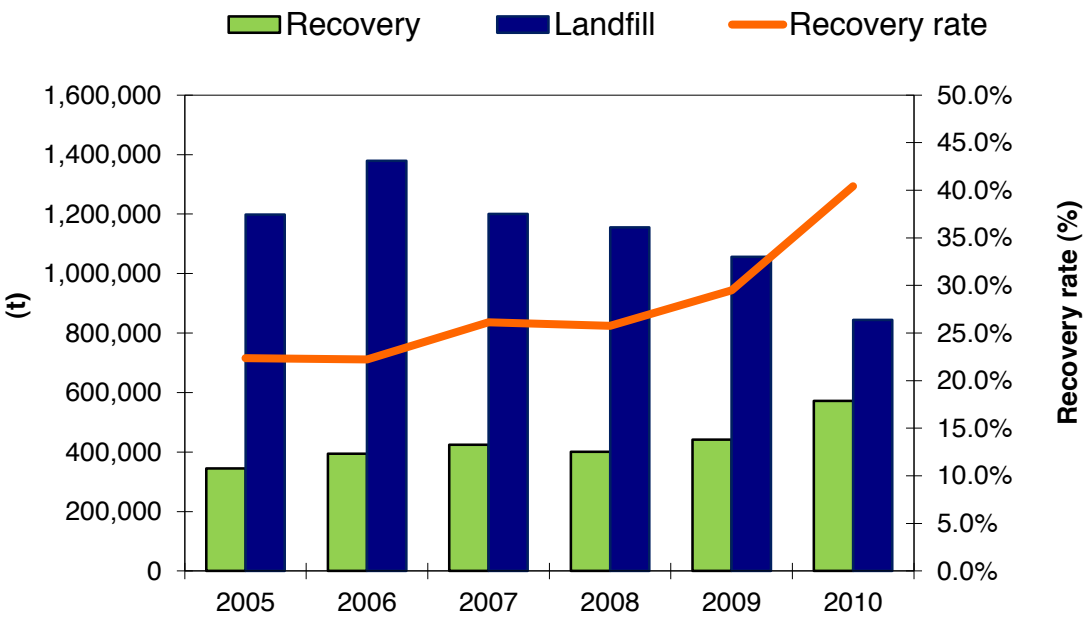


Figure 7: Disposal and recovery trends in household waste management, 2005–2010

The reduction in household waste managed reflects the decrease in personal consumption but is significant that it runs contrary to population growth trends (Figure 8). The trends in Figure 8 would suggest that personal consumption is a stronger influencer of household waste generation than population growth.

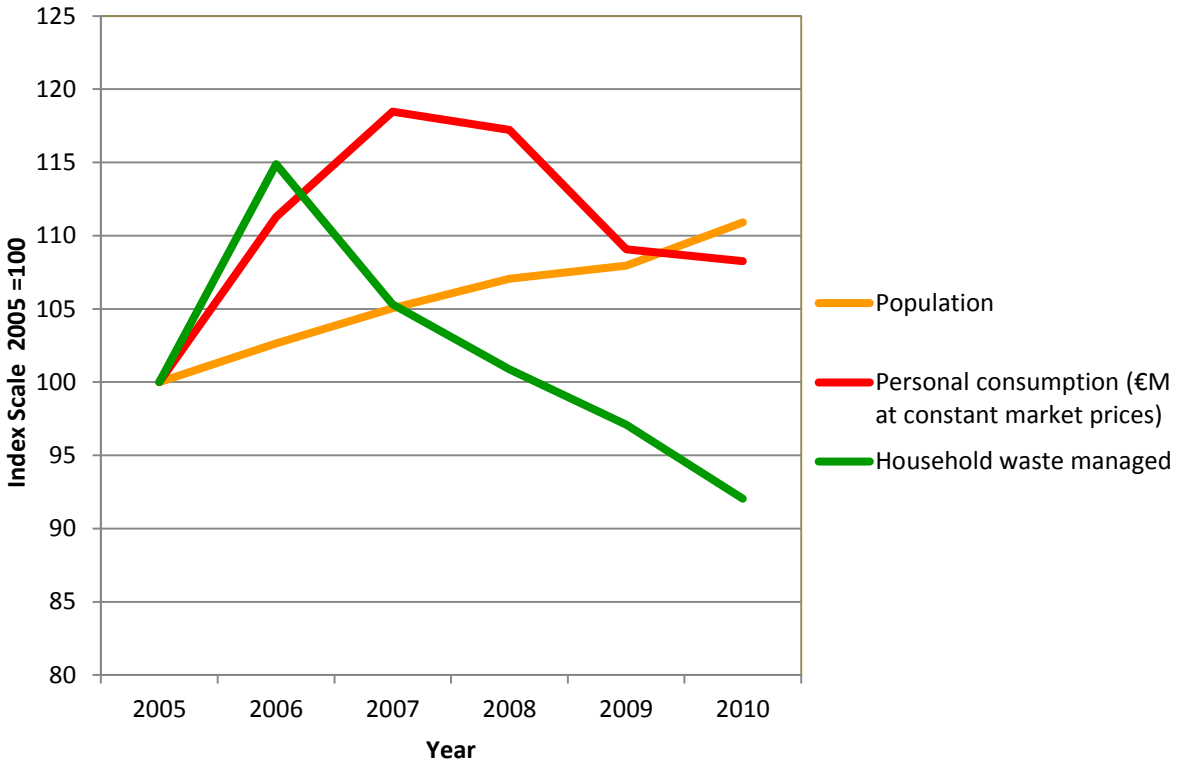


Figure 8: Household waste managed with population and personal consumption indices[35], 2005-2010

The improvement in household recovery rates represents a very positive step despite the economic turndown and reported low landfill gate fees. This increase in recovery reflects the increased collection of source segregated recyclables via increased use of the third bin (organics) (although modest for 2010) and a consistent stream of dry recyclables from kerbside and bring centres (Table 10). Private sector operators introduced a fourth bin at household kerbside in 2010 for the collection of segregated glass in eleven local authority areas, amounting to 4,188 t (Appendix B). The amount of RDF/SRF sent for recovery in the State and abroad increased from 47,818 t in 2009 to 94,174 t in 2010 (97% increase).

[35] CSO data on population and personal consumption.

Table 10: Relative proportions of collected and 'brought' household waste in 2009 and 2010 (% by weight)[36]

	Waste streams					
	Mixed residual waste (black bin) [37]	Mixed dry recyclables (green bin)	Glass (New)	Mixed organics (brown bin collected & home composted)	Bring banks & civic amenity sites & retail WEEE	Total
% Total collected & brought (1,498,469 t), 2009	56%	18%	0%	7%	19%	**100%**
% Total collected & brought (1,420,706 t), 2010	54%	19%	<1%	7%	20%	**100%**

(Source: Local authority survey, WEEE compliance schemes)

A survey of the character and composition of collected household waste is available on the EPA website at www.epa.ie/downloads/pubs/waste/plans/name,11659,en.html, and summarised in Appendix F of this report.

The Minister for the Environment, Community & Local Government raised the landfill levy to €50 per tonne of waste disposed at authorised and unauthorised landfill facilities, effective since 1 September 2011. It is likely that the levy will increase to €65 per tonne from July 2012 and €75 per tonne from July 2013. Such increases, along with the now fully implemented EPA pre-treatment obligations should further contribute to this increasing household waste recycling trend. However, there remains a significant distance to go to meet the national target of 50% diversion of household waste from landfill by 2013.

3.3.2 Household waste collection

The household waste collection market is in a period of rapid transition, with many local authorities exiting the household waste collection market. In 2008, 15 local authorities were collecting waste at kerbside, in 2010 this had dropped to 13 local authorities and by the start of 2012 there were only three local authorities collecting household kerbside waste[38]. The transition of customers from local authority to private sector collectors is causing issues with regard to gathering data for the National Waste Report, in that households served and tonnages collected are proving difficult to verify and this leads to an increased risk in errors in reporting of number of households served and tonnages collected at kerbside.

The total quantity of household waste collected at kerbside reduced by 4% in 2010 (1,101,054 t compared to 1,145,486 t in 2009) with no appreciable drop in the number of houses serviced. Of the household waste collected at kerbside, 65% was collected by the private sector in 2010 (60% in 2009) and 35% by local authorities (40% in 2009), reflecting that local authorities are exiting the waste collection market. The local authorities, despite their low presence in the collection market, still have the highest percentage collection of brown bin waste at 68% (mainly due to local authority collection in large urban centres and longer established collection services).

[36] Excludes estimated household uncollected waste.
[37] Includes residual waste delivered direct to landfill by householder.
[38] Waterford Co Co, Galway City Co and Kerry Co Co (Killarney Town Council).

Summary information on household waste collection by waste management region is shown in Appendix B. According to the data, the total quantity of household waste collected or brought to collection facilities in Ireland in 2010 was 1,383,851 t, with an estimated 36,855 t of organic waste composted at home. Local authorities reported that 241,211 t of household waste was collected at civic amenity sites and bring banks. The WEEE compliance schemes reported collecting 18,515 t of household WEEE from retail premises.

Of the 1,101,054 t of household waste collected at kerbside in 2010, 69.9% of the tonnage related to mixed residual waste, 23.9% mixed dry recyclables, 5.8% organics and 0.4% glass (segregated glass collection being reported for the first time in 2010). The household kerbside collection of mixed residual waste decreased by 6% in 2010, mixed dry recyclables increased slightly by <1% in 2010, and organics increased by 2%.

CSO's census data indicates that there were 1,709,973 occupied houses in the State in April 2011.[39] Of these, a reported 1,208,094 dwellings (c. 71%) were serviced by a waste collection service, which was further broken down into:

- 59,135 dwellings (5%) on a single bin (black bin) service only;
- 738,080 dwellings (61%) on a 2-bin service only (residuals bin and dry recyclables bin); and
- 410,879 dwellings (34%) on a 3-bin service (residuals bin, dry recyclables bin, and organics bin).

Table 11: Percentage of occupied houses on a collection service

Housing stock 2011	CSO census data	2,004,175
Vacant dwellings 2011	CSO census data	294,202
Number of occupied houses 2011	CSO census data	1,709,973
Number of houses on a collection service 2010	Local authority data	1,208,094
% occupied houses on a collection service	71%	

Figure 9 and Table 12 present the relative proportions of the different household waste collection services. The level of 2-bin and 3-bin penetration has been calculated using the number of household customers served on a 2-bin or 3-bin as a fraction of the overall number of households serviced with a collection service in 2010. For Wicklow County Council, the 2009 household serviced numbers have been used as the number of client

[39] NWR 2010 references 2011 CSO census data for population, housing stock and vacant dwellings.

households reported as served with a collection service in the return for 2010 was deemed unreliable due to a number of waste collectors failing to report their 2010 Annual Environmental Return.

The figures indicate that 95% of serviced households have at least a 2-bin service available to them. It is thus clear that 95% of collected household waste already meets the minimum EU Landfill Directive (1999/31/EC) pre-treatment obligations in Article 6 (by virtue of the 2-bin system).

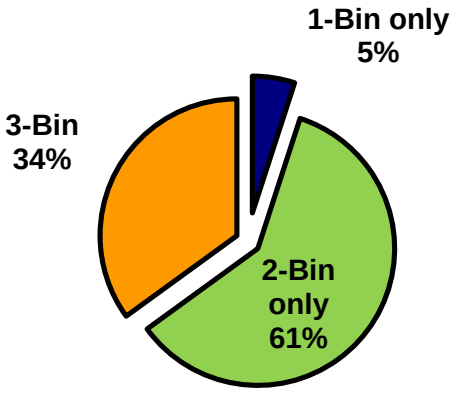


Figure 9: Proportion of households on kerbside waste collection services by bin service type

The overall percentage of unserviced occupied households has increased from 24% in 2009 to 29% in 2010 (Table 12). For this report, CSO's census 2011 data has been used.[40] The number of occupied houses has increased since 2006, significantly in the case of the commuter counties. The data on number of households served with a collection service comes from the Annual Environmental Returns of waste collection permit operators. The EPA identified some anomalies in the reported number of households on a waste collection service (e.g. where local authorities contracted household waste collection to private sector contractors and there was double counting of households served). The EPA is aware of other issues that affect the data on number of households served, and may result in an underestimation, such as (i) failure of collectors to report their annual reports (ii) operators underestimating the number of households served when collecting from apartments (iii) difficulty in estimating the number of households served by a 'tag-a-bag' service. The EPA has recommended a number of changes to the e-reporting systems that inform this dataset and advised local authorities of particular issues for validation.

[40] Since National Waste Report 2006, CSO's occupancy data from 2006 census had been used.

Table 12: Distribution and type of collection service providers for household waste

Local authority area	Local authority			Private sector			Combined private & local authority serviced 41		Unserviced occupied households (%) 42
	MSW / residual	MDR (2nd bin)	Organic (3rd bin)	MSW / residual	MDR (2nd bin)	Organic (3rd bin)	2-bin market penetration	3-bin market penetration	
Donegal	0	0	0	✓	✓	0	66%	0%	63%
Roscommon	0	0	0	✓	✓	✓	77%	9%	60%
Cavan	0	0	0	✓	✓	✓	81%	7%	55%
Offaly	0	0	0	✓	✓	✓	77%	8%	53%
Sligo	0	0	0	✓	✓	✓	97%	3%	53%
Limerick County	0	0	0	✓	✓	✓	61%	38%	52%
Laois	0	0	0	✓	✓	✓	81%	16%	49%
Kerry	✓	✓	✓	✓	✓	✓	79%	21%	48%
Clare	0	0	0	✓	✓	✓	50%	43%	47%
South Tipperary	✓	✓	0	✓	✓	0	99%	0%	45%
Mayo	0	0	0	✓	✓	✓	75%	16%	43%
Galway County	0	0	0	✓	✓	✓	85%	15%	42%
Leitrim	0	0	0	✓	✓	0	100%	0%	40%
Kilkenny	✓	✓	0	✓	✓	0	98%	0%	39%
Westmeath	0	0	0	✓	✓	✓	98%	1%	39%
Carlow	0	0	0	✓	✓	✓	72%	28%	38%
Monaghan	0	0	0	✓	✓	✓	80%	18%	36%
Cork County	✓	✓	0	✓	✓	0	100%	0%	33%
North Tipperary	0	0	0	✓	✓	✓	96%	2%	31%
Wexford	✓	✓	✓	✓	✓	✓	72%	28%	30%
Waterford County	✓	✓	✓	✓	✓	✓	43%	57%	28%
Meath	0	0	0	✓	✓	✓	85%	0%	25%
Louth	0	0	0	✓	✓	✓	64%	28%	24%
Longford	0	0	0	✓	✓	✓	69%	27%	24%
Dublin City	✓	✓	✓	✓	✓	✓	24%	64%	23%
Wicklow	0	0	0	✓	✓	✓	75%	2%	19%
Kildare	✓	✓	0	✓	✓	✓	64%	36%	19%
Limerick City	0	0	0	✓	✓	✓	61%	39%	16%
Waterford City	✓	✓	✓	✓	✓	✓	0%	99%	16%
Galway City	✓	✓	✓	✓	✓	✓	14%	85%	13%
Cork City	✓	✓	0	✓	✓	0	99%	0%	10%
Fingal	✓	✓	✓	✓	✓	✓	17%	83%	6%
South Dublin	✓	✓	✓	✓	✓	✓	15%	85%	5%
Dun Laoghaire-Rathdown.	✓	✓	0	✓	✓	0	90%	10%	2%
TOTAL (t) / Wtd. AVERAGE	**245,951**	**98,836**	**43,139**	**527,370**	**165,334**	**20,698**	-	-	**29%**

(Source: Local authority survey, CSO)

[41] Calculated based on the number of households serviced with a 2-bin, 3-bin household waste kerbside collection as a fraction of the total number of households serviced with a kerbside waste collection.
[42] This is calculated based on the difference between the number of occupied houses (CSO 2011 data) and the number of households serviced with a kerbside waste collection as a fraction of the total number of occupied houses.

Table 13 presents the data for separate household kerbside collections of organic waste (brown bin) in 2009 and 2010 and organic waste brought by householders to civic amenity sites/bring centres. There was only a very small increase in the tonnage of organic waste reported as collected at kerbside (from 62,447 t in 2009 to 63, 837 t in 2010), in comparison to the significant increase between 2008 and 2009 (37,920 t collected in 2008). This small increase is disappointing considering that collections rolled out in a further five local authority areas in 2010 (Dun Laoghaire Rathdown, Longford, Mayo, Roscommon and Sligo County Councils), where in all cases, private sector operators came into the market. It may be that some private sector operators failed to submit their Annual Environmental Returns to the local authority and therefore there is under-reporting of tonnage. A reduced number of bin collections due to the cold weather conditions in January and November-December 2010 was cited as a possible reason for the reduction in tonnage in the Dublin City Council area. There was negligible tonnage collected (<150 t) in nine local council areas (Figure 10). In some cases this is because the service only commenced in 2010 and it is anticipated that the tonnage will increase in 2011 and beyond.

An amount of 21,422 t of household organic waste was separately collected at civic amenity sites in 2010 (a slight decrease in the 23,679 t reported in 2009).

By end 2010, twenty-eight of the thirty-four local authority areas had household kerbside organic bin collections. The six local authority areas remaining without a service were Cork City, Cork County, Donegal, Kilkenny, Leitrim and South Tipperary. The market penetration of the 3-bin service varied hugely (1% to 99%) across local authority areas where the service was available and, as expected, the more rural counties in general had the most unserviced households (Tables 12 and 13).

Table 13: Household organic wastes collected at kerbside and brought to civic amenity sites, 2009 and 2010

Local authority area	2009		2010	
	Separate kerbside collection of household organic waste (brown bins) (t)		Separate kerbside collection of household organic waste (brown bins) (t)	
	Local authority	Private sector	Local authority	Private sector
Carlow	-	625	-	907
Cavan	-	8	-	109
Clare	-	112	-	875
Dublin City	16,128	3,214	15,894	132
Dun Laoghaire Rathdown	-	-	-	22
Fingal	16,023	932	15,701	1,567
Galway City	3,699	1,530	3,457	1,981
Galway County	-	761	-	1,172
Kerry	404	1	358	139
Kildare	-	6,888	-	4,322
Laois	-	210	-	100
Limerick City	-	81	-	259
Limerick County	-	122	-	1,060
Longford	-	-	-	119
Louth	-	2,514	-	2,646
Mayo	-	-	-	579
Meath	-	139	-	160
Monaghan	-	271	-	421
North Tipperary	-	104	-	123
Offaly	-	105	-	130
Roscommon	-	-	-	103
Sligo	-	-	-	25
South Dublin	-	134	2,736	171
Waterford City	3,439	450	3,083	751
Waterford County	1,932	256	1,853	335
Westmeath	76	-	-	1
Wexford	62	1,814	57	2,232
Wicklow	-	413	-	258
Sub-totals (t)	**41,763**	**20,684**	**43,139**	**20,698**
Totals separate kerbside collection (t)	**62,447**		**63,837**	
Household organic waste collected at civic amenity sites & bring centres (t)	23,679		21,422	
Totals kerbside collection plus civic amenity sites & bring centres (t)	**86,126**		**85,259**	

(Source: Local authority survey)

Taking the total kerbside collected household waste (1,101,054 t) (refer Appendix B) it can be calculated that the separate household organics collection (third bin) represents only 5.8% (up from 5.5% in 2009) of the total tonnage of kerbside collected household waste.

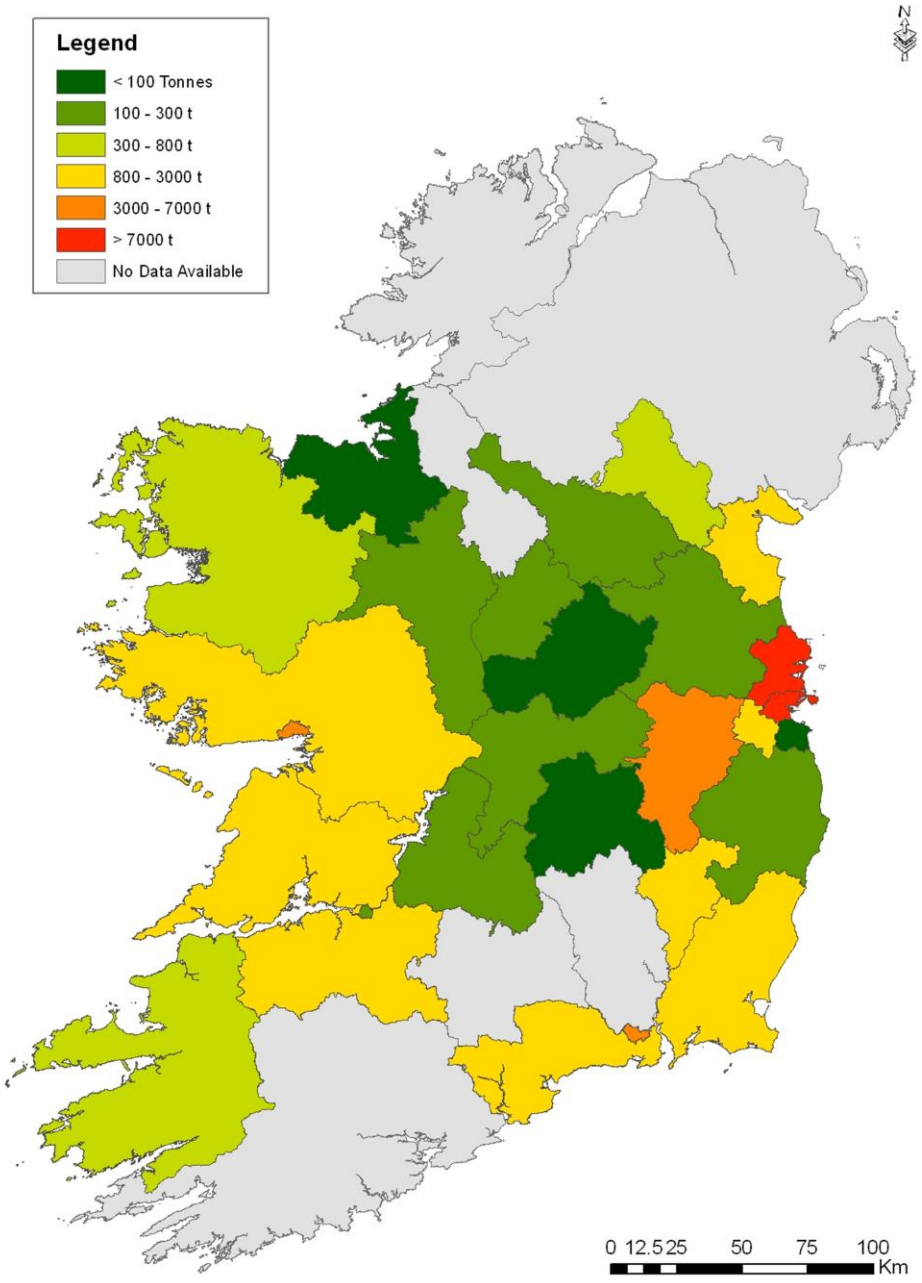


Figure 10: Kerbside collection of household organic waste in 2010 by local authority area

3.3.3 Household waste brought to civic amenity sites and bring banks

Local authorities were surveyed to gather data on household waste brought to civic amenity sites and bring banks. The quantity of household waste deposited at civic amenity sites and bring banks decreased in 2010 by 11% compared to 2009 (there had been a 10% reduction between 2008 and 2009). The tonnage of waste collected at bring banks decreased by 10% to a total of 82,909 t (there had been a 10% reduction between 2008 and 2009 also). Householders deposited 18,515 t household WEEE at electrical retail premises in 2010 (18,622 t in 2009). Further information on waste 'bring-facility' infrastructure is provided in Section 10.7 of this report.

Appendices C and D provide information on waste types and respective quantities collected at bring banks and civic amenity sites by householders in 2010. Some civic amenity sites also accept waste for disposal in addition to recovery, e.g. mixed residual waste and some hazardous waste. The proportion of overall household waste managed that is accepted at bring banks and civic amenity sites was 19.7% in 2010, emphasising the role of such community infrastructure in the national waste management strategy.

3.3.4 Uncollected household waste

According to information provided by local authorities, approximately 72% of occupied Irish households availed of kerbside collection in 2010 (note that the housing stock and occupancy is based on the 2011 national census). In some areas, participation rates (in a collection scheme) were as low as 37%; while in some of the larger urban centres, coverage was reported to be close to 100%. Part of the low participation issue may have been due to no kerbside collection service being offered, particularly in rural areas.

The amount of waste generated by households and not collected at kerbside was assessed by first allowing a factor for bin-sharing on collection routes (EPA allowed for 2% bin-sharing at occupied houses) and then multiplying the percentage of remaining occupied houses without kerbside waste collection by an average value of waste produced per household. This waste may still have been collected and entered the waste treatment chain. It may have been brought to civic amenity sites, to bring banks or directly to landfills; or it may have been fly-tipped and transferred to waste treatment facilities by local authority personnel. Moreover there is also a proportion that has been home composted. To work out the amount of uncollected waste, the amount of waste composted at home and the conventional 'bin-type' household waste brought to bring banks, civic amenity sites (other than glass, bulky waste, some wood, C&D waste and WEEE), as well as that brought to landfills (including fly-tipped) was subtracted from the amount of waste generated by households and not collected at kerbside.

In 2010, the national estimate of uncollected household waste was 265,681 t. This figure is not directly comparable to the 128,000 t of uncollected waste estimated for 2009 because the method of estimation was changed between the two years. Also of significance for the 2010 data is that the EPA used CSO census 2011 data on housing stock and vacant dwellings. The number of occupied houses in the State increased by 206,682 (14%) between census 2006 and census 2011. The EPA plans to further improve the way the amount of uncollected waste is assessed and also to take account of new developments such as the increasing practice of pay-by-use waste compactors, as well as better estimates of bin sharing arrangements (common in apartment complexes and between families).

In March 2011, the EPA made a submission to the Central Statistics Office for the inclusion of a module on household waste management behaviours in the Quarterly National Household survey (QNHS). The QNHS is a large-scale, nationwide survey of households in the State, designed to produce quarterly labour force estimates but also conducting special modules on different social topics each quarter. In the past, the QNHS has included modules on recycling and energy conservation. It would be extremely beneficial to have a statistically valid survey of household waste management behaviours to assist in the implementation and evaluation of national waste policy. The module would seek to understand what options in respect of waste management are available to, and availed of by households. Data that could be gathered in the survey would include bin-sharing practices, management of household hazardous wastes, home composting etc.

3.4 Commercial waste

For the purposes of data handling, 'commercial waste' is waste collected from commercial premises (shops, pubs, restaurants etc.) as well as wastes arising from municipal premises such as schools, hospitals etc., and non-process industrial waste (from factory canteens, offices etc.). After household waste, the commercial waste stream is the next largest component of municipal waste.

The EPA has well validated data on household waste collected and brought, on household and commercial waste disposed to landfill and on overall municipal waste recovered (material recovery and mechanical treatment activities, composters etc.), and the commercial waste recovered is estimated from analysis of these datasets. It is hoped that with the evolution of the e-reporting systems for waste collection permit Annual Environmental Returns that commercial waste collection data can be reported in future years, however the EPA will be dependent on local authorities undertaking a thorough validation of the data.

It is difficult for the waste industry operators to identify at the landfill gate what proportion of municipal waste accepted is household and what is commercial, but in order to report on the BMW in MSW this is being pro-actively sought. A similar challenge faces recovery organisations accepting mixed dry recyclables. Such classifications impact on recycling and diversion figures and thus on target achievement. It is very important for waste operators to apply due care to the division between household wastes and commercial sources wastes in the residual stream to landfill.

The quantity of managed commercial waste decreased by 12% to 1,141,015 t in 2010. The recovery rate decreased 6% on that reported for 2009, to stand at 45% (Table 14). This is a difficult trend to explain except that commercial activities associated with high personal consumption were perhaps disproportionately contributing to recovery rates (e.g. retail, food and entertainment). A similar downward cycle was reported between 2006 and 2007.

Table 14: Commercial waste management, 2005 to 2010

	2005	2006	2007	2008	2009	2010
Quantity disposed to landfill (t)	630,194	601,372	813,818	758,178	640,737	633,010
Quantity recovered (t)	614,772	725,697	735,257	719,219	659,070	508,005
Recovery rate (%)	49%	55%	48%	49%	51%	45%
Total (t)	**1,244,967**	**1,327,068**	**1,549,075**	**1,477,397**	**1,299,807**	**1,141,015**

(Source: Recovery organisations survey, local authority survey, landfill survey)

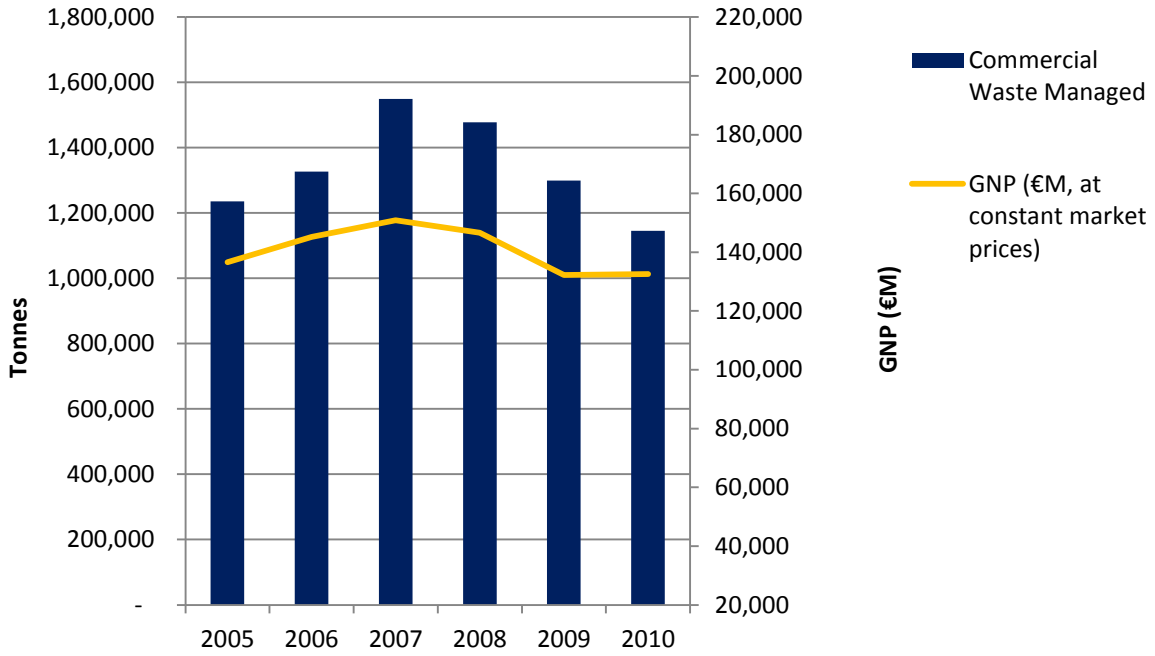


Figure 11: Commercial waste generation and GNP, 2005 to 2010

The EPA published surveys on the character and composition of commercial waste in 2009 (Municipal Waste Characterisation 2008 Surveys) and in 2010 (3rd Bin Commercial Waste Bin Characterisation Report). The results of the 2008 surveys are summarised in Appendix H and the full reports are available for download at:

www.epa.ie/downloads/pubs/waste/plans/name,11659,en.html; and,
www.epa.ie/downloads/pubs/waste/stats/name,30407,en.html.

4 BIODEGRADABLE MUNICIPAL WASTE

4.1 Introduction

Biodegradable municipal waste (BMW) comprises those elements of the household, commercial (including non-process industrial waste) and cleansing waste streams that will rot or degrade biologically. The main constituents of the biodegradable proportion of municipal waste are typically parks and garden waste, food waste, timber, paper, card and textiles. It is estimated that there was 1,817,983 t of BMW in managed municipal solid waste (MSW) in 2010. There are two key pieces of EU legislation that deal with biodegradable waste. The first is the Landfill Directive[43] (1999/31/EC) which requires the diversion of biodegradable waste from landfill. The second EU instrument is the new Waste Framework Directive (2008/98/EC), Article 22 of which requires Member States to take measures to encourage separate collection of biowaste (putrescible portion of biodegradable wastes).

4.2 EU Landfill Directive

The legal obligations falling due under the Landfill Directive were examined in some detail in Section 4 of the EPA's National Waste Report 2008[44]. In relation to biodegradable municipal waste the Landfill Directive sets limits on what can be sent to landfill. These limitations (which are tied to the 1995 statistical base year for waste production in Ireland[45]) are phased, with each phase having a stricter obligation in relation to diversion. Ireland negotiated with the EU Commission for a four-year extension to the first two compliance dates specified in Article 5 (2006 to 2010, and 2009 to 2013 respectively).

These obligations can be summarised as follows:

- By 16th July 2010 Ireland can only landfill a maximum 75% of the BMW generated in 1995,
- By 16th July 2013 Ireland can only landfill a maximum 50% of the BMW generated in 1995,
- By 16th July 2016 Ireland can only landfill a maximum 35% of the BMW generated in 1995.

Table 15: Targets for biodegradable waste diversion from landfill (per Directive 1999/31/EC)[46]

Baseline		Quantity BMW generated (t)
1995		1,220,840

Targets

Target year[47]	Landfill Directive target	Maximum quantity allowed to be landfilled (t, rounded)
2010	75% of quantity BMW generated in 1995	916,000
2013	50% of quantity BMW generated in 1995	610,000
2016	35% of quantity BMW generated in 1995	427,000

[43] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:182:0001:0019:EN:PDF
[44] http://www.epa.ie/downloads/pubs/waste/stats/name,27341,en.html.
[45] National Waste Database Report 1995. EPA, 1996.
[46] Revised in the National Waste Report 2008.
[47] The Landfill Directive allows Ireland to avail of a derogation under Article 5 which postpones the 2006 and 2009 targets for 4 years.

4.3 Municipal waste flows

Given the complexities of the national waste management collection and treatment arrangements for municipal wastes, it is appropriate to examine the biodegradable element of the different streams making up MSW. This is made possible by detailed EPA characterisation studies on commercial and household waste streams.[48]

In Ireland MSW comprise the following streams (i) household waste (ii) commercial and non-process industrial wastes (canteen and office) and (iii) street cleansing waste.

Each of these streams in turn can be sub-divided into unique waste flows (influenced by collection and source type) that will have a given character with respect to biodegradability.

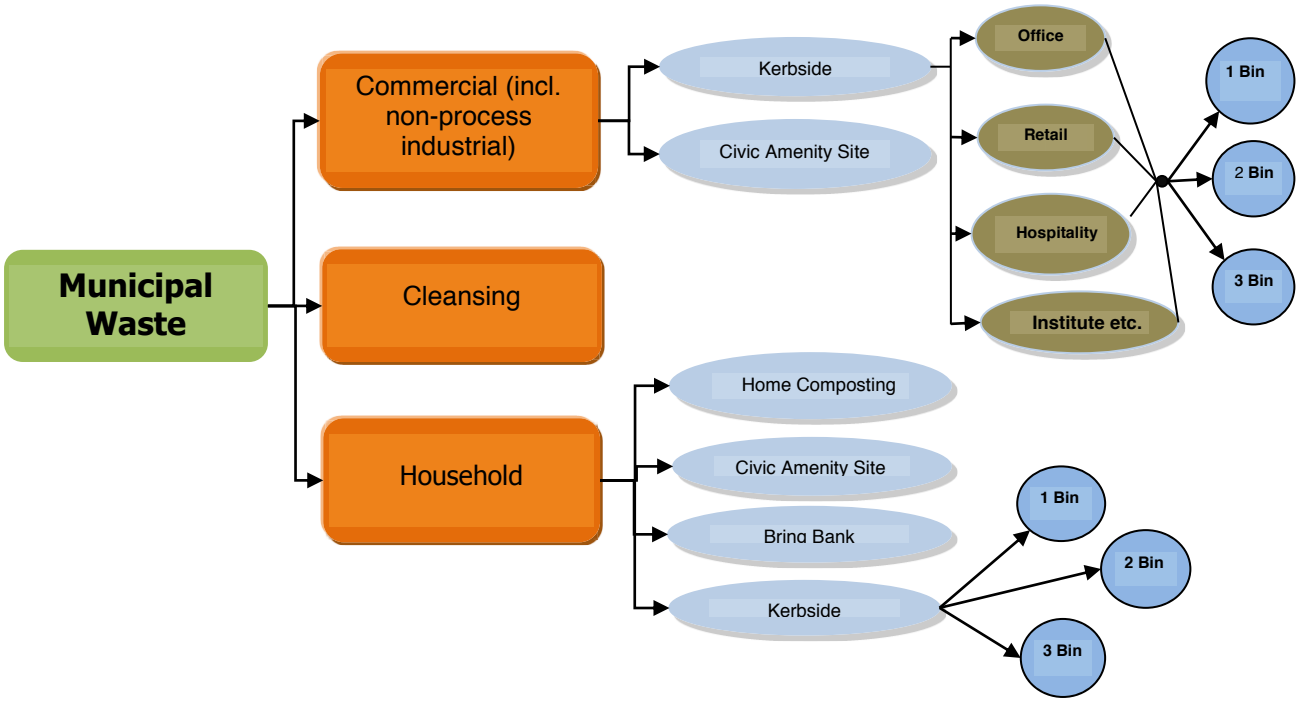


Figure 12: Municipal waste collection/presentation flows

These flows are further complicated through multiple intermediary processing possibilities (between producer and final disposal/recovery). Intermediate treatments can include transfer, material recovery facility, echanical biological processing, waste to energy, composting etc., either collectively for the streams or individually, and at any one time price can influence decisions. This huge complexity of collection, mixing, transfer, sorting, processing and treatment means that it has become virtually impossible to track the specific fate of an individual tonne of municipal waste produced by a household or commercial premises from cradle to grave; however it is possible to determine the fate of municipal wastes overall, and by extension the biodegradable element within it.

[48] http://www.epa.ie/whatwedo/resource/nwr/municipal/#d.en.12485.

4.4 Municipal biodegradable waste arisings

The EPA funded municipal waste characterisation study (2008)[49] yields characterisation and biodegradability factors for household and commercial waste streams. The summary results of this study are presented for convenience in Appendix H. This characterisation work in addition to the recent work undertaken on characterisation of outputs from waste treatment processes (*Protocol for the Evaluation of Biodegradable Municipal Waste to Landfill,* EPA 2011) are essential to the calculation of achievement of Landfill Directive targets as well as inputting to greenhouse gas emissions assessment.

In determining the BMW content of a municipal waste stream, two general approaches may be used:

- Where appropriate, EPA approved BMW factors can be used to calculate the BMW content of the waste stream (Appendix H); or
- With the agreement of the EPA, alternative BMW factors can be used for municipal waste streams if they have been determined following a waste characterisation survey carried out in accordance with this protocol.

BMW arisings in Ireland in 2010 are presented in Table 16. The higher proportion of biodegradables in the commercial waste stream means that the BMW arisings for this stream are broadly similar to the household stream despite the significant difference in total tonnage managed for each.

Table 16: BMW in managed municipal waste streams for 2010

Municipal waste stream	Tonnage managed	BMW content (refer Appendix H)	BMW arisings 2010
Household	1,420,706	65%	923,459
Street sweepings / cleansing	18,713	65%	12,163
Commercial	1,145,923	77%	882,361
		Total:	1,817,983

EPA municipal waste characterisation studies (EPA, 2008) summarised in Appendix H indicate that organics (food and garden waste) comprise c. 23% by weight of the gross household bin waste stream. This equates to an estimate 'available' organic waste content of c. 253,305 t in the kerbside collected household waste stream, of which 63,837 t is reported separately collected at kerbside (Table 13). Even if one factors in the home composting estimate (36,855 t, refer Appendix B) and the organic waste delivered by households to civic amenity sites (21,422 t) there remains a conservative estimate of c. 131,000 t available organic waste in the managed household waste stream that is not separately collected at kerbside. It is accepted that not all of this potentially 'available' organic material is suitable for brown-bin collection systems (e.g. food still in packaging). Nevertheless, greater penetration of the third organics bin to householders across the State (currently estimated at only 35% of householders, refer Table 12) would significantly cut into the available material and divert it from landfill.

[49] www.epa.ie/downloads/pubs/waste/plans/name,11659,en.html.

4.5 BMW disposed to landfill

In order to assist Ireland's obligations under the Landfill Directive (1999/31/EC), the EPA reviewed all operational MSW landfill licences in 2009. New conditions were inserted into the licences limiting the acceptance of BMW and requiring the determination of the biodegradable content of MSW sent to landfill.

The landfill operator is required to report to the EPA on a quarterly basis in relation to the quantity of MSW and BMW accepted at the landfill. The EPA developed a web-based reporting system to streamline the reporting of BMW data and details of this reporting tool have been communicated directly to all relevant landfill operators. The EPA-approved BMW factors are incorporated into this reporting system (refer also Appendix H).

The first national BMW target under the Landfill Directive came into effect in July 2010; accordingly the quantity of BMW for the second half of 2010 was accurately recorded and reported as per licence obligations. The overall amount of BMW in MSW landfilled nationally in the second half of 2010 as reported by landfill operators to the EPA was 429,773 t (which equates to 58% BMW in MSW). This is less than the Landfill Directive target of 458,000 t (pro rata), and scaling up for a full year, the total BMW landfilled in 2010 is estimated at 860,000 t. This 860,000 t of BMW managed represents approximately 47% of the gross national BMW arisings (Table 17).

Table 17: BMW content in MSW streams landfilled (during second half of 2010, i.e. Landfill Directive compliance period)

Waste Type	MSW (t)	BMW (t)	% BMW in MSW
2-bin residual commercial waste	74,493	55,869	75%
2-bin residual household waste	130,591	82,272	63%
3-bin residual commercial waste	51,270	34,863	68%
3-bin residual household waste	146,789	68,991	47%
Bio-stabilised residual waste	486	0	0%
Bulky waste from sorting of MSW skips	15,741	7,870	50%
Fines residues from MSW bin collections ("wet waste")	32,307	30,692	95%
Fines residues from MSW skips	26,072	10,939	42%
Other (international catering waste, cleansing, facility own-factors etc.)	93,580	58,956	63%
Oversize residues from MSW bin collections ("wet waste")	69,476	28,485	41%
Oversize residues from MSW skips	65,509	28,816	44%
Residual MSW from civic amenity facility	9,366	5,901	63%
Residues from source separated recyclable waste ("clean material recovery facility")	18,820	8,845	47%
Untreated 1-bin commercial waste	180	138	77%
Untreated 1-bin household waste	272	177	65%
Untreated cleansing waste (fly-tipping, street bins & sweepings etc.)	10,472	6,807	65%
Untreated MSW skip waste	460	152	33%
Totals	**745,881**	**429,773**	**58%**

(Source: EPA's Office of Environmental Enforcement BMW returns)

An analysis of the types of waste accepted for disposal during 2010 is shown in Table 17. It is interesting to note, for example, that just 27% of material disposed of originated from 3-bin collection routes (household and commercial). Unless this is to change (i.e. greater market penetration of a 3-bin collection service), then Ireland will face significant challenges in meeting the next Landfill Directive Target. Less than 500 t of bio-stabilised material was consigned to landfill in the second half of 2010, illustrating that there does not appear to be any significant processing of mixed biowaste (low-grade biowaste derived from residual bins) in the country. Notable also is that there was approximately 40,000t BMW 'fines' produced from processing MSW. This material is produced in a limited number of facilities nationally which would make capture and full stabilisation more easily achievable. Treatment of this stream alone would remove approximately 80,000 t BMW annually from landfill.

As pointed out in the National Waste Report 2009 (EPA, 2011), it is a national priority that the necessary infrastructure be developed to treat both organic wastes that must be collected separately and the biodegradable portion of residual bins from municipal waste collections. Non-compliance with the BMW limit in the landfill licence (currently set at 47% of MSW intake) undermines this priority. The BMW limits in the landfill licences are annual limits and apply to the total quantity of municipal wastes accepted in a calendar year, or part thereof. The quarterly BMW reports required of landfill operators give an indication of how much BMW the landfill has accepted as the year progresses and will facilitate corrective actions to be taken if required. The EPA's Office of Environment Enforcement has conducted a significant number of audits at landfills to validate BMW returns. The audited landfills accounted for some 76% of waste landfilled in 2010. These audits examined documentation and records at waste facilities to look behind the system used in determining BMW content of waste disposed of. The quarterly BMW reporting system indicates that the Landfill Directive compliance achieved in 2010 is continuing into 2011 (Figure 13). The significant drop in MSW generation and that proportion of it that is consigned to landfill (down 13% in 2010 on 2009 figures) has, in parallel with pre-treatment activities, contributed to the achievement of the Landfill Directive BMW obligations.

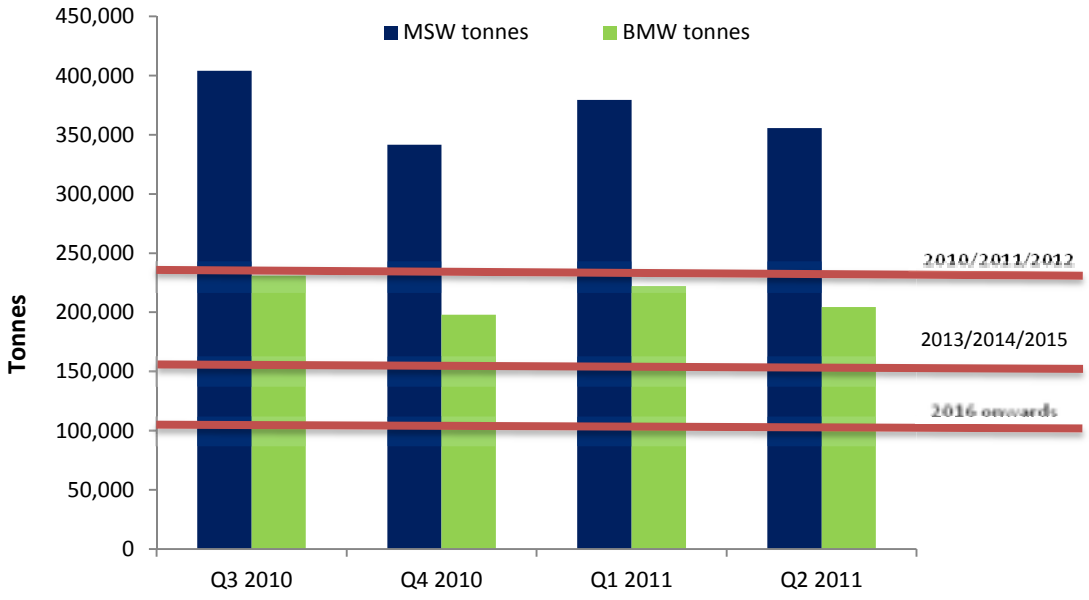


Figure 13: Tonnage of MSW and BMW landfilled per quarter in 2010 versus Landfill Directive Targets

4.6 Greenhouse gas emissions from the landfilling of municipal solid waste, past, current and future trends

The disposal of municipal solid waste in landfill produces significant quantities of landfill gas as a result of the anaerobic decomposition of organic materials. Landfill gas can contain up to 65 percent methane by volume. Methane (CH_4) is a greenhouse gas with a global warming potential (GWP) twenty-one times that of carbon dioxide (CO_2). Globally it is estimated that CH_4 emissions from landfill contribute approximately 3 percent to annual global anthropogenic greenhouse gas emissions. In Ireland the emission of CH_4 from landfill accounts for approximately 2 percent of national total greenhouse gas emissions or 1 Mt carbon dioxide equivalent (CO_2e). If the use of landfill gas flaring and utilisation was not prevalent on landfills in Ireland, greenhouse gas emissions from the sector would be three times higher than they are currently.

The regulation of landfills by the EPA has resulted in a significant improvement in landfill operational standards. However, with the regulation of landfills and the implementation of management practices such as compaction and covering of waste, significant quantities of landfill gas (and thus CH_4) are produced. This requires management. The two main forms of landfill gas management are the use of enclosed flares and utilisation plants.

The Landfill Directive (1999/31/EC) introduced specific targets for the landfilling of organic material and also requires that landfill gas "shall be collected from all landfills receiving biodegradable waste and that landfill gas must be treated and used" and that "if the gas collected cannot be used to produce energy it must be flared". To this end landfill operators have installed landfill gas management infrastructure which has required significant investment. Since the introduction of such measures in the mid-1990s, landfill operators have continually increased the proportion of CH_4 recovered from approximately 10 percent of that produced in 1996 to approximately 70 percent of that produced currently on a national basis. However, this level of recovery needs to be maintained and enhanced into the future, as it will be a number of years before reduced biodegradable waste acceptance at landfills will have an effect on the quantity and quality of landfill gas produced. It is estimated that if Ireland meets the targets for the diversion of biodegradable waste from landfills progressively in 2013 and 2016, and that if landfill gas management is maintained, greenhouse gas emissions from landfills will be approximately half of current levels (0.5 Mt CO2e) by 2020.

4.7 Future actions for biodegradable waste

As noted previously, the separate kerbside collection of household food and garden waste (in a 3-bin system) increased substantially from 18,705 t in 2007 to 63,836 t in 2010 (c. 340% increase). In 2011 the Minister of the Environment Community and Local Government issues a consultation document on the possibility of introducing compulsory organics bin collections for households.

Source separated collections of biodegradable waste in themselves will not ensure that Ireland meets the diversion targets set out in the EU Landfill Directive. For example, the residual bin from a three bin household collection service can contain up to 47% biodegradables (by weight) (see Table H-1 of Appendix H). Treatment of this biodegradable component of the residual waste will be essential in order to meet the 2013 and 2016 Landfill Directive diversion obligations (see distance to target estimates in Table 18). To date there has been minimal reported development, or consistent operation, of infrastructure to deal with the biodegradable component of the residual bin from municipal waste collections. Waste to energy incineration and refuse derived fuel use will certainly contribute, as will mechanical biological treatment (MBT) processes.

The economic slow-down has contributed in a significant way to Ireland's achievement of the first EU Landfill Directive diversion target for biodegradable waste (in addition to the EPA's and Government's regulatory interventions) through significant decreases in personal consumption and municipal waste generation. It must be recognised that this low economic output basis for achievement of targets is not in itself sufficient to ensure continued compliance with EU requirements, particularly as the economy recovers. Accordingly efforts in waste prevention, diversion to recovery and the development of necessary supporting infrastructure must continue.

The Government increased the landfill levies to €50 per tonne in 2011, and this is due to rise again in 2012 and 2013 (to €75/t). This levy will have a significant effect by making pre-treatment more cost effective - particularly in respect of BMW - thereby reducing the quantities and costs of residual disposal to landfill.

Table 18: Distance-to-target for EU Landfill Directive BMW diversion, 2010

Target year	Maximum quantity allowed to be landfilled (t, rounded)
2010	916,000
2013	610,000
2016	427,000

Current position	Quantity biodegradable municipal waste landfilled (t)
2010	860,000 (EU Target Achieved)

Distance to SECOND EU Landfill Directive target (July 2013) (t, rounded)
250,000 in excess of target
Distance to THIRD EU Landfill Directive target (July 2016) (t, rounded)
433,000 in excess of target

5 PACKAGING WASTE

5.1 Packaging waste targets

Ireland is obliged to meet recovery and recycling targets under the Packaging Directive (94/62/EC as amended). The Waste Management (Packaging) Regulations 2007 (S.I. No. 798 of 2007) give effect to the EU Directive. The quantity of packaging waste managed in 2010 (863,714 t) was lower than in 2009 (972,430 t). The quantity recovered increased from 70% in 2009 to 74% in 2010, well in excess of the 60% recovery target for 2011 under the Packaging Directive. The Packaging Directive also sets minimum non-energy use recycling targets for materials contained in packaging waste (e.g. plastics, wood) by December 2011 (refer Table 1A). The quantities of packaging recycled (i.e. not including packaging sent for energy recovery) are also reported in Table 19. For 2010, the EU 2011 recycling targets have been met.

The quantity of packaging waste landfilled is estimated using waste composition factors.[50] The quantity of packaging waste recovered and recycled[51] is based on data provided by recovery operators through EPA surveys. All packaging reported as sent for recovery is taken as 100% recovered (e.g. paper and cardboard sent to paper mills abroad) although it would be expected that there would be a certain residual that goes for disposal.

Table 19: Packaging waste managed, 2010

Material	Quantity managed (t)	Quantity recovered (t)	National recovery rate (%)	Quantity landfilled (t)	National landfill rate (%)	Quantity recycled (t)	National recycling rate (%)
Paper and cardboard	325,874	273,647	84.0	52,227	16.0	273,647	84.0
Glass	142,072	110,520	77.8	31,552	22.2	110,520	77.8
Plastic	187,617	73,848	39.4	113,769	60.6	73,842	39.4
Ferrous[52]	30,999	19,224	62.0	11,775	38.0	19,224	62.0
Aluminium	12,048	4,707	39.1	7,341	60.9	4,707	39.1
Other metals	5,842	5,166	88.4	676	11.6	5,166	88.4
Textiles	1,434	0	0	1,434	100	0	00.0
Wood	101,483	100,639	99.2	844	0.8	84,440	83.2
Other[53]	56,345	49,182	87.3	[54]7,163	12.7	570	1.0
Total	**863,714**	**636,933**	**73.7**	**226,782**	**26.3**	**572,115**	**66.2**

(Source: Recovery organisations survey, landfill survey, 2008 waste characterisation study)

[50] www.epa.ie/downloads/pubs/waste/plans/name,11659,en.html
[51] Any packaging reported as used as a fuel (R1) was deducted.
[52] This figure does not describe incidental packaging contained in the general ferrous metal stream.
[53] Composites, mixed packaging and refuse derived fuel.
[54] Not including refuse derived fuel.

The increase in the recovery rate in 2010 is due to the decrease in the quantity of packaging waste estimated as landfilled, and there was an increase in paper and cardboard and the packaging element of refuse derived fuel recovered compared to 2009.

The EPA's survey of recovery operators, which gathers data on waste packaging recovered (as reported in Table 19), does not differentiate between whether the tonnage was recovered on behalf of self-compliers or members of Repak, the national packaging compliance scheme. However, a majority of the packaging recovered would have come from Repak members.

Figure 14 shows the recovery rate for packaging waste from 2001 to 2010 and shows that packaging recovery rates have been, and are likely to remain, compliant with all EU targets.

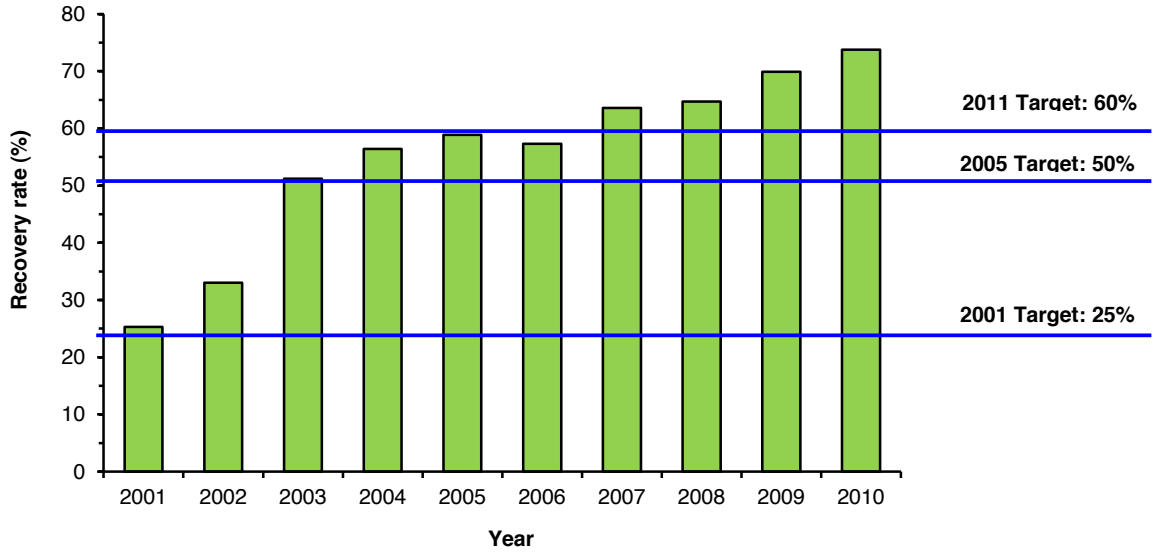


Figure 14: Recovery of packaging waste, 2001–2010, and progress towards targets

5.2 Packaging self-compliers

Producers of packaging waste can either join a compliance scheme (Repak is currently the only packaging compliance scheme in the State) or self-comply. Local authorities are responsible for enforcement of the Packaging Regulations 2007, including enforcing the obligations of self-complying producers. Information on packaging self-compliers was gathered from local authorities, and the data provided is outlined in Table 20. Four local authorities reported no registered self-compliers in their area in 2010 (Donegal, Leitrim, Waterford County and Wexford), which is the same as in 2009.

Local authorities reported that a number self-complying producers failed to provide their 2010 packaging recovered data in quarterly reports, therefore the packaging recovered tonnage is an incomplete dataset (Tables 20 & 21). All self-complying producers have a legal obligation to submit reports to the relevant local authority on packaging placed on the market and waste packaging reused, recovered and disposed. It is essential that these reports are submitted so that local authorities can determine whether self-complying producers are meeting their legal obligations with regard to recovery and recycling targets. It is also recommended that local authorities undertake thorough validation of the reports submitted by self-compliers.

Table 20: Packaging self-compliers registered in local authority areas in 2010

Local authority	Number of companies	Number of premises	Packaging placed on the market (t)	Packaging recovered (t)[55]
Carlow	1	1	5	3
Cavan	4	4	4,457	838
Clare	3	5	3,832	134
Cork City	2	2	33	20
Cork County	5	9	568	304
Donegal	0	0	0	0
Dublin City	17	20	3,327	2,153
Dun Laoghaire-Rathdown	7	8	2,408	1,545
Fingal	18	18	4,828	3,499
Galway City	4	9	355	253
Galway County	3	14	133	97
Kerry	2	3	26	5
Kildare	5	6	2,345	1,697
Kilkenny	1	1	236	133
Laois	1	1	17	10
Leitrim	0	0	0	0
Limerick City	1	3	26	16
Limerick County	4	4	6,471	1,011
Longford	2	2	27	30
Louth	4	5	364	210
Mayo	5	5	1,357	714
Meath	7	8	853	422
Monaghan	4	4	762	533
North Tipperary	1	3	17	9
Offaly	1	4	11	8
Roscommon	4	6	117	36
Sligo	1	1	0	0
South Dublin	22	22	11,708	6,055
South Tipperary	2	2	158	65
Waterford City	1	2	12	0
Waterford County	0	0	0	0
Westmeath	2	5	364	224
Wexford	0	0	0	0
Wicklow	4	4	301	175
Total	**138**[56]	**181**	**45,387**	**20,196**

(Source: Local authority survey)

[55] Local authorities reported that 7 self-complying producers failed to provide all or some quarterly reports.
[56] Representing 106 unique producers (some companies are registered in more than one local authority functional area).

Table 21 compares packaging self-complier data for 2009 and 2010, in terms of number of companies and number of premises registered and the tonnage of packaging placed on the market.

Table 21: Packaging self-compliers, 2009 and 2010

Year	Number of registered self-complier companies	Number of premises	Packaging placed on the market (t)	Packaging recovered (t)
2009	108	205	61,475	15,576
2010	106	181	45,387	20,196

(Source: DECLG and local authorities)

6 WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT

6.1 Introduction

The Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) aims to prevent the generation of WEEE and sets targets for the collection and treatment of WEEE in an environmentally sound manner. The WEEE Regulations[57] transpose the WEEE Directive into Irish law, and obligations under the WEEE Regulations came into effect in Ireland on 13th August 2005. The data on WEEE collection and treatment in Ireland in 2010 are based on information supplied by WEEE and other waste recovery operators, by the WEEE compliance schemes (WEEE Ireland and European Recycling Platform (ERP)), and by self-complying producers of electrical and electronic equipment (EEE).

6.2 WEEE collected, treated, exported and stored in 2010

Table 22 shows that 45,012 t of WEEE were collected in Ireland in 2010, which is very similar to the 45,327 t collected in 2009. On average, more than 8 kg of household WEEE were collected from each person living in the Republic of Ireland in 2010. This is about double the target of 4 kg per person specified by the WEEE Directive. Similar to 2009, there was a decrease of the recovery of heavy items such as washing machines, dishwashers and cookers. This is consistent with the decrease in quantities of such appliances reported as put on the market between 2008 and 2010[58] The collection and recovery of all other types of WEEE, on the other hand, increased between 2009 and 2010.

Table 22: WEEE collected, treated, exported and stored in 2010

	Waste fridges and freezers	Waste large household appliances[59]	Waste TVs and monitors	Waste lighting equipment[60]	Other WEEE[61]	Total WEEE
Collected (t)	6,338	16,298	6,447	807	15,123	**45,012**
Treated in RoI (t)	0	10,735	5,423	694	6,489	**23,341**
Exported to EU[62] (t)	6,293	5,489	684	80	8,460	**21,006**
Exported to non-EU (t)	0	0	0	0	64	**64**
Total recovered (t)	5,780	12,834	5,613	704	12,421	**37,352**
Change in stock (t)	45	74	340	32	110	**602**

(Source: WEEE and other waste recovery organisations survey, WEEE producers)

[57] Waste Management (Electrical and Electronic Equipment) Regulations, 2005 (S.I. No. 290 of 2005) and European Communities (Waste Electrical and Electronic Equipment) Regulations, 2011, as amended (S.I. No. 355 of 2011 as amended by S.I. No. 397 of 2011).
[58] Information provided by WEEE Register Society Ltd.
[59] For example dishwashers, washing machines, cookers.
[60] Includes all fluorescent lamps (including compact fluorescent lamps), high and low pressure gas discharge lamps, and equipment for the purpose of spreading or controlling light with the exception of household luminaires.
[61] For example stereos, telephones, toys, vacuum cleaners, toasters, computers.
[62] Exports to Northern Ireland amounted to 6,209 t in 2010.

In 2010, 407 t of pre-owned and used EEE were collected for reuse (i.e. not waste). Like in 2009, most of the material for reuse consisted of information and communication technology equipment e.g. mobile phones, computers.

Slightly less than half of the total WEEE collected in 2010 was exported to other EU countries for treatment. A large proportion of the WEEE breakdown material from initial treatment in Ireland was also exported for further recovery. Only 64 t of WEEE were transferred directly from Ireland to outside the EU.

Since 31st December 2008, producers of EEE have been responsible for meeting targets for the percentage recovery, and the percentage component, material and substance reuse and recycling of WEEE sent for treatment. Estimated recovery and recycling percentages are summarised in Table 1A of this report and suggest that in 2010 the Republic of Ireland met all WEEE treatment targets set by EU and national legislation.

Consideration should be given to expected amendments to the EU Persistent Organic Pollutants (POPs) Regulation which may affect recycling and recovery of WEEE. Separated plastics, resulting from the treatment of WEEE, that contain specified brominated flame retardants above a certain concentration threshold will be required to be managed as POPs waste in accordance with the EU POPs Regulation.

7 END OF LIFE VEHICLES

7.1 The ELV Directive

Waste arising from end-of-life vehicles (ELVs) can result in various negative impacts upon the environment. In 1997 a proposal for a directive aimed at making the activities of vehicle dismantling and recycling more environmentally friendly was adopted by the European Commission. The proposal suggested that clear targets for reuse, recycling and recovery of vehicles and their components should be identified and that producers should be encouraged to produce vehicles of much higher recyclability upon end-of-life. The initial proposal then provided the foundation for the ELV Directive (2000/53/EC), which has served as the strategic framework by which the collection, storage, dismantling and treatment of end-of-life vehicles (ELVs) are governed. The ELV Directive (2000/53/EC) was transposed into national law in 2006[63].

The primary aim of the ELV Directive is to minimise the negative impacts upon the environment that are generally associated with ELVs. To ensure that this is achieved, certain steps must be taken both at the design and waste phases of a vehicle's life cycle. In the design phase environmental considerations are taken into account and the requirements for dismantling, reuse and recycling of ELVs and their components are integrated into the design and production of new vehicles. The use of hazardous materials is strictly controlled in the construction of vehicles. During the waste phase it is ensured that suitable treatment systems are in place to remove hazardous materials (oil, batteries) as well as reuse and recycle other materials (metals, plastics, glass, tyres). ELVs are generally passenger cars or light commercial vans. The ELV Directive applies to vehicles used for the carriage of passengers with a maximum of eight seats or vehicles weighing no more than 3.5 t and used for the transport of goods. ELV legislation is covered under the 'producer responsibility initiative' set of legislation, and therefore producers have a number of obligations with regards to ELVs. Vehicle manufacturers and professional importers who are responsible for placing vehicles on the Irish market are collectively defined as producers. Producers are obliged to establish a national system in order to facilitate the collection, treatment and recovery of specified vehicles. When establishing a national system, producers contract a network of authorised treatment facilities (AFTs), which must accept ELVs from registered owners free of charge. It is an offence to discard an ELV to any person other than an ATF.

In order to accept ELVs from registered owners, an ATF must possess a waste permit or where deemed appropriate, a waste licence.[64] The facility must also meet the minimum technical requirements taking into account storage capability, appropriate treatment and recovery of ELVs. ATFs are required to keep records of the total weight of materials for reuse, recycling, recovery and disposal that arise from the processing of ELVs. A Certificate of Destruction (COD) is issued free of charge by the owner or operator of an ATF to the registered owner, an authorised person of a local authority or a member of An Garda Síochána upon the deposit of an ELV to that facility. All relevant information pertaining to that COD is then noted on the National Vehicle File. Depolluted ELVs can be sent for shredding to one of three ELV shredders currently operating in the State or alternatively may be sent abroad.

[63] Waste Management (ELV) Regulations 2006 (S.I. No. 282 of 2006), as amended by the Waste Management (ELV) (Amendment) Regulations 2010 (S.I. No. 142 of 2010), and by S.I. No. 661 of 2011 European Communities (End-of-Life Vehicles) (Amendment) Regulations 2011.

[64] The EPA's OEE, the DECLG and local authorities are working together to ensure that unauthorised vehicle dismantlers in the State are subject to a system of inspections and sanctions that prevents their on-going operation without permits.

7.2 ELV Directive Targets

The EU ELV Directive sets out specific targets which are to be met by each Member State relating to the reuse, recycling and recovery of ELVs. The targets for each Member State are:

(i) By 1 January 2006 a minimum of 80% reuse and recycling and a minimum of 85% reuse and recovery; and

(ii) By 1 January 2015 a minimum 85% reuse and recycling and a minimum of 95% reuse and recovery.

In order to create a dataset which can be used to identify rates of reuse, recovery and recycling of ELVs within Ireland, the EPA carries out an annual survey of ATFs and ELV shredder operators[65] throughout Ireland. Local authorities reported to the EPA that 143 ATFs were authorised in 2010 (of which 139 were operational). Three local authorities reported no ATFs operational in their functional areas in 2010 (Dun Laoghaire Rathdown, Longford and Waterford City).

The most up-to-date dataset is currently for calendar year 2009. 2010 data is at a preliminary stage of analysis and will be finalised prior to reporting to the European Commission in June 2012[66].

In 2009, ATFs reported 152,455 ELVs which were accepted for depollution with a total weight of approximately 163,070 t. Information on tonnages reused, recycled and recovered from ELV dismantling and depollution is summarised in Table 23.

Table 23: Total reuse, recovery and recycling of ELVs arising in 2009 and treated in the State or abroad.

Reuse (t)	Total recycling (t)	Total recovery (t)	Total reuse and recycling	Total reuse and recovery
1,288	127,320	132,940	128,608	134,228
Total number of end-of-life vehicles	152,455			
Total vehicle weight (t)	163,070		79%	82%

(Source: ATF survey, shredder operator survey, metal handler survey, *Depollution and Shredder Trial Report*)

In 2009, total reuse and recycling was 78.9% and total reuse and recovery was 82.3%. These percentages are below the EU targets of 80% reuse and recycling recycling and 85% reuse and recovery which have been in force since January 2006.

Preliminary analysis of 2010 data[66] indicates that total reuse and recycling was 77% and total reuse and recovery 78%; down 2% and 5% respectively from 2009. The main reason for the approx. 5% decrease in total reuse and recovery rates in 2010 in comparison to 2009 figures is because auto shredder residue went for disposal to landfill in 2010 whereas previously it had been used as landfill cover (and therefore recorded as recovery). The EPA's Office of Environmental Enforcement has determined that automobile shredder residue is not a suitable landfill cover material.

[65] 127 ATFs and 3 shredders were surveyed for 2009 data.
[66] Preliminary data as up-to-date recycling and recovery information on depolluted ELV shells exported in 2010 was not available at the time of publication.

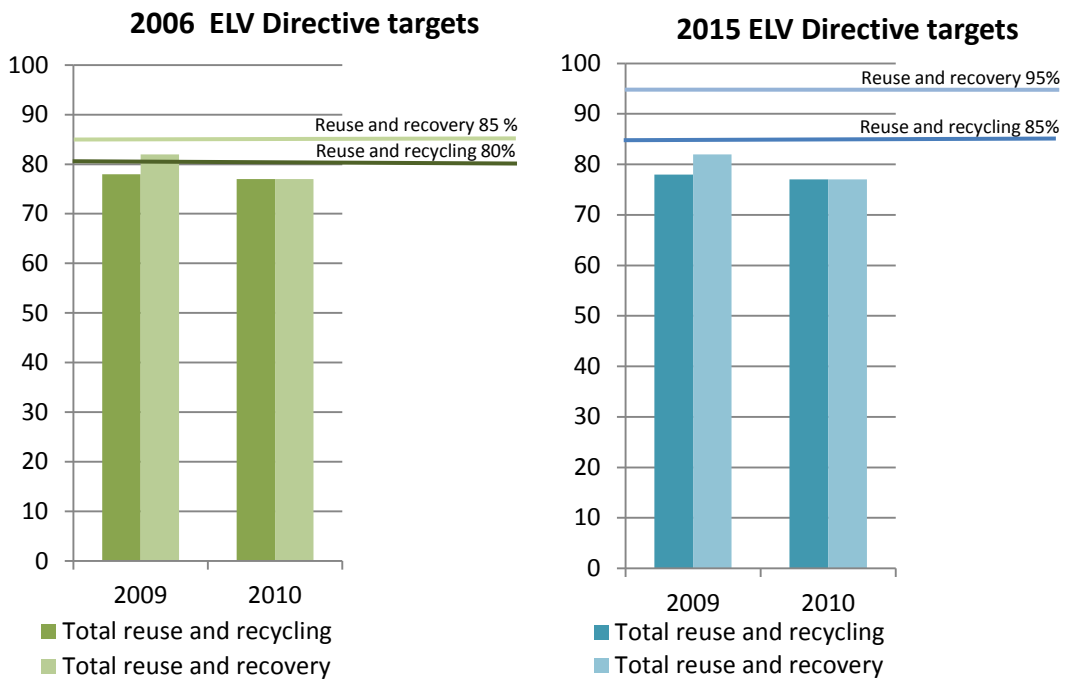


Figure 15: ELV reuse, recovery and recycling rates for 2009 and 2010[66] compared to ELV Directive targets.

Urgent action is needed to increase reuse/recovery/recycling of ELV materials in order to meet the EU targets and DECLG are engaging with stakeholders in this regard. It is expected that a combination of actions will be required, which could include increased dismantling of non-metallic ELV components prior to shredding, the application of post-shredder technologies to extract recyclable materials (such as metals, plastics) from the shredded material, and energy recovery of shredded material (perhaps combined with metal recovery from combustion residues). Consideration will also have to be given to expected amendments to the EU Persistent Organic Pollutants (POPs) Regulation which will have the consequence of requiring materials from ELVs that contain certain brominated flame retardants (e.g. foams) to be managed as POPs waste if above a certain concentration threshold. In accordance with the EU POPs Regulation, POPs waste shall be disposed of or recovered, in such a way as to ensure that the POP content is destroyed or irreversibly transformed.

8 CONSTRUCTION AND DEMOLITION WASTE

8.1 Construction and demolition waste collected in 2010

It is estimated that 3,464,683 t of construction and demolition (C&D) waste was collected in 2010, a decrease of 32% since 2009. The decrease in this waste stream is reflective of the economic downturn and its effect on the construction sector. The bulk of this tonnage was made up of soil and stones (2,517,194 t), with the remaining 947,489 t consisting of other C&D waste materials such as rubble, metals, timber, plastic, glass, wood and mixed C&D waste. Data on C&D waste collected are derived from Annual Environmental Returns submitted by waste permit collection holders. There were approximately 2,000 active waste collection permit holders authorised to collect C&D waste in 2010.[67]

Table 24: Quantity of C&D waste collected by local authority area in 2010.

Local authority area	Total reported C&D waste collected (t)
Carlow	11,909
Cavan	5,817
Clare	37,592
Cork City	174,166
Cork County	251,080
Donegal	24,419
Dublin City	464,942
Dun Laoghaire-Rathdown	194,252
Fingal	478,759
Galway City	108,839
Galway County	22,636
Kerry	55,024
Kildare	280,880
Kilkenny	18,436
Laois	51,525
Leitrim	2,169
Limerick City	43,624
Limerick County	51,901
Longford	3,041
Louth	38,434
Mayo	23,883
Meath	199,693
Monaghan	20,708
North Tipperary	14,724
Offaly	41,833
Roscommon	5,176
Sligo	13,482
South Dublin	369,687
South Tipperary	118,899
Waterford City	31,254
Waterford County	24,769
Westmeath	36,696
Wexford	95,756
Wicklow	148,674
TOTAL (t)	3,464,683

(Source: Local authority survey)

[67] It was not possible to get an accurate figure from the WCP e-reporting systems for 2010 data.

8.2 Construction and demolition waste treated in 2010

Information on the quantity of C&D waste managed (either recovered or disposed) in 2010 was derived from three sources:

(i) EPA-licensed landfills.
(ii) EPA-licensed waste treatment facilities.
(iii) Local authority permitted waste facilities.

The quantity of C&D waste managed in 2010 (2,578,076 t) represented a 50% decrease on that reported in 2009. In 2010, 2,533,454 t of C&D waste was estimated as recovered and 44,621 t (2% of overall managed) was disposed at EPA licensed landfills (Tables 25 & 26).

Table 25 outlines the collection and management of the soil and stones element of C&D waste. In 2010, more soil and stone was reported as collected (2,517,194 t) than was reported as managed (1,720,469 t). A 98% recovery rate was achieved.

Table 25: Collection and management of C&D soil and stones, 2010

Collected (t):		**2,517,194**
Management (t)	**Recovery**	**Disposal**
EPA licensed landfills	205,079	34,811
Local authority permitted sites	1,390,419	0
EPA licensed waste facilities (other than landfill)	90,160	0
Total	**1,685,658**	**34,811**
Grand total	**1,720,469**	
Recovery rate[68]	**98%**	

(Source: Local authority survey, landfill survey and recovery organisations survey)

Table 26 outlines the collection and management of the non-soil and stones fraction of C&D waste. In 2010, the quantity of non-soil and stone C&D waste collected exceeded the quantity reported as managed by 89,882 t (10%). A 99% recovery rate was achieved.

[68] Recovery rate is calculated based on reported tonnage managed by recovery or disposal.

Table 26: Collection and management of C&D waste (excluding soil and stones), 2010

Collected (t):		947,489
Management (t)	**Recovery**	**Disposal**
Metal	314,348[69]	
Wood	45,222	85
Glass		67
Plastic	50	30
Gypsum based waste	606	
Rubble	180,375	138
Mixed or other C&D waste	307,195	9,491
Total	**847,796**	**9,811**
Grand total	**857,607**	
Recovery rate	**99%**	

(Source: Local authority survey, landfill survey, metal survey and recovery organisations survey)

8.3 Construction and demolition waste data anomalies

There is a large discrepancy between the reported quantity of C&D waste collected and the reported quantity of C&D waste treated (i.e. recovered or disposed). There was a gap of 0.8 Mt (32%) for soil and stones fraction and a gap of 0.1 Mt (10%) for the non-soil and stones fraction, resulting in an overall gap of just under 0.9 Mt.

In 2010, local authorities reported that there were 443 active waste facility permit holders authorised to accept C&D waste. Of these, 367 submitted an AER to the local authorities, representing an 82% reporting rate. Local authorities estimate that there may have been an additional 85,174 t of C&D recovered at local authority permitted sites in 2010 based on the 76 non-reporting facilities. Taking this into account, this still leaves a discrepancy between the reported collection of total C&D waste and the reported disposal and recovery of total C&D waste of 801,433 t.

Data gathered for the National Waste Report indicates that waste treatment organisations had a net storage of 36,595 t of C&D waste at their facilities during 2010. This figure is not included in the total reported management of C&D figure above. Taking this into account, this still leaves a discrepancy between the reported collection of total C&D waste and the reported disposal and recovery of total C&D waste of 764,838 t.

A proportion of the gap between the reported collection of C&D waste and the reported disposal and recovery of C&D waste may be attributable to C&D waste recovered at facilities authorised under Certificate of Registration. These facilities are not currently surveyed as part of the National Waste Report and current estimates for tonnage of C&D managed at these facilities are unreliable. Facilities authorised under Certificate of Registration (for C&D classes) will be surveyed as part of the NWR 2011 data gathering process.

[69] This includes 4,006 t of metal reported as recovered In Ireland and 310,341 t of metal exported for recovery abroad.

Gaps in the C&D dataset may also in part be attributed to a lack of attention to maintenance of good records and the obligation on the sector to provide accurate data to the local authorities annually. Operators must report quantities in tonnes (and not kilograms) in their AERs. The EPA is also aware that there is an issue with regard to the types of material that the construction industry defines as waste, which may lead to secondary resources not being properly accounted for. Any C&D waste collected in 2010 but in storage at the end of 2010 will not appear in the managed dataset until it is either recovered or disposed so stockpiling of C&D waste can affect the dataset. There is also the potential that waste collection permit holders may fail to properly account for where the waste was collected (particularly in local authority areas with city and council boundaries), which could potentially lead to errors in the reporting of the quantity of C&D waste collected.

The recovery rates estimated for C&D waste need to be treated with caution given the poor records and reporting experience with the sector. Operators need to greatly improve their records in relation to their wastes and additional enforcement and data verification efforts by the local authorities may be necessary to ensure that this happens.

In late 2011 the EPA commenced a project to look at anomalies between the reported collection of C&D waste and the reported management of C&D waste in Ireland. Given the significant gap in C&D figures reported as collected and reported as managed over the last few years, there is a perception of illegal activity occurring. Ireland has been questioned by the European Commission in relation to suspected illegal backfilling of C&D waste, and there have been European Court of Justice rulings and court cases. This C&D anomaly project will undertake a comprehensive C&D waste flow analysis from point of collection through to point of recovery, disposal or export. Arising from this work, guidance documents will be produced for use by local authorities, waste collectors and waste treatment organisations. These guidance documents will include information on estimating quantities (including density calculations for volume to tonnage estimates for different materials), application of treatment codes, recommendations on accurate reporting of data etc. Once completed, these guidance documents will be uploaded to the EPA's website.

In the preparation of the C&D data for this report, it became apparent that some local authorities had not carried out basic validations on C&D collection and C&D recovery data reported in AERs. Desk-top validations of all AERs should be carried out by local authorities as a minimum. A simple check to identify operators reporting very high tonnages of C&D waste (where operator has reported in kilograms versus tonnes in error) should be queried. Had the EPA not picked up these errors in the national C&D dataset the collection tonnage would have been over-reported by 700,000 t. The importance of local authority validation of C&D collection and recovery data cannot be over-emphasised as failure to do so can have a huge impact on the quality of the national dataset.

9 HAZARDOUS WASTE

9.1 Introduction

Waste is classified as being hazardous when it displays properties (i.e. oxidising, explosive, flammable, irritant, toxic etc.) that make it dangerous or potentially harmful to human health or the environment. A full list of these properties is listed in Annex III of the Waste Directive 2008/98/EC, as transposed into national legislation by the European Communities (Waste Directive) Regulation, 2011 (S.I. No. 126 of 2011).

Industry is the largest generator of hazardous waste in Ireland, giving rise to hazardous waste materials such as industrial solvents, sludges, oils and chemicals. Households, small businesses, farms and the healthcare and construction sectors also generate substantial quantities of hazardous waste such as lead-acid batteries, waste electrical and electronic equipment, healthcare risk waste, solvent-based paints and varnishes, pesticides, waste oils and asbestos.

Information on the management of hazardous waste in 2010 was compiled from three sources, based on the location of treatment:

- Data on the treatment of hazardous waste on-site at the industry where it was generated (which occurs under EPA licence at companies mainly in the pharmachem sector) was obtained from Pollutant Release and Transfer Returns (PRTR) and Annual Environmental Reports.
- Data on the treatment of hazardous waste off-site at commercial facilities in Ireland was obtained by way of the hazardous waste treatment survey, which was sent to facilities that are licensed by the EPA or permitted by the local authority to treat hazardous wastes.
- Data on the import and export of hazardous waste for treatment was provided by the National Transfrontier Shipment Office (NTFSO).

The total amount of hazardous waste managed in 2010 is presented in Table 27 and illustrated in Figure 16. Total hazardous waste managed in 2010 (excluding contaminated soil) is 1% less than in 2009.

Table 27: Summary of hazardous waste management, 2005–2010 (excluding contaminated soil)

Category	2005	2006	2007	2008	2009	2010
[70]On-site at industry (t)		88,409	82,732	72,038	74,668	76,655
[71]Off-site in Ireland (t)		60,872	91,240	113,839	89,992	93,048
Exported (t)	146,811	134,904	147,542	157,207	150,395	143,180
Total (t)		**284,184**	**304,941**	**319,098**	**289,910**	**287,874**[72]

(Source: IPPC PRTR annual returns; hazardous waste treatment survey; TFS records, recovery organisations survey for WEEE)

[70] 'On-site at industry' refers to hazardous waste recovered or disposed on-site at the industrial facility where it was generated, under Integrated Pollution and Prevention Control (IPPC) licence.

[71] 'Off-site in Ireland' refers to waste sent to EPA licensed commercial hazardous waste treatment facilities for recovery or disposal.

[72] A reported 25,010 t of hazardous waste was blended at facilities in Ireland prior to export as a waste for further treatment (24,736 t reported as exported for use as fuel in cement kilns, a further 274 t hazardous waste was blended prior to export for incineration abroad). These quantities are correctly counted in both the treated "offsite in Ireland" column and the "exported" columns. However, they have been discounted in the total column to avoid double counting in the total amount of hazardous waste managed. Similar discounting also took place in the 'total' columns in 2007, 2008 and 2009 to avoid double counting in the total amount of hazardous waste managed.

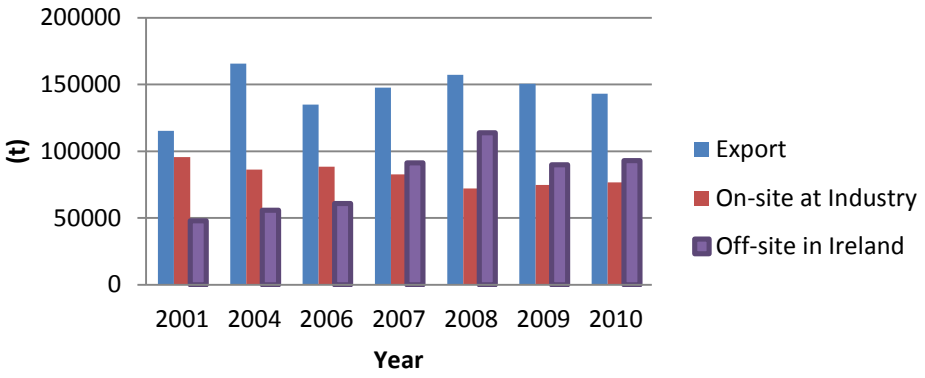


Figure 16: Location of hazardous waste treatment 2001-2010 (excluding contaminated soil)

9.2 Hazardous waste treatment in Ireland

The reported quantity of hazardous waste treated in Ireland in 2010 was 169,704 t, which is an increase of 3% since 2009 (Table 28). This was as a result of an increase in the treatment of hazardous waste on site at industry in 2010 (increased by 3% on 2009 tonnage to 76,655 t) and an increase in the treatment of hazardous waste off-site at commercial facilities in Ireland (also increased by 3% on 2009 tonnage to 93,049 t). The increase in the treatment of hazardous waste off-site at commercial facilities in Ireland was largely attributable to an increase in the treatment of waste oil, solvent and WEEE.

Table 28: Location of hazardous waste treatment in Ireland, 2010 (excluding contaminated soil)

Category	[73]On-site at industry (t)	[74]Off-site in Ireland (t)	Total (tonnes)
Solvents	47,909	20,776	68,685
Solvents (halogenated, where specified)	6,696	258	6,953
Oil waste (mineral oil)	181	32,778	32,958
Industrial hazardous waste (other)	4,147	4,191	8,338
Salts and saltcake	17,057		17,057
Healthcare risk waste		9,171	9,171
Oily sludges		6,032	6,032
Equipment (electrical, electronic, mechanical)		7,483	7,483
Chemical waste (other)		138	138
Paint, ink and varnish waste (including packaging)	6	864	870
Acid and alkali waste		2,946	2,946
Aqueous washing liquids and mother liquors (07 __ 01*)	280	5,465	5,745
Solid wastes from MFSU of pharmaceuticals (07 05 13*)	322	0	322
Sludges and filter cakes		579	579
Packaging (contaminated or containing residues)	24	1,673	1,697
Photographic chemical waste		248	248
Metal- and heavy metal-containing waste		2	2
Absorbents, wiping cloths etc. (EWC 15 02 02)	22		22
Fluorescent lamps		301	301
Laboratory and general chemical waste	11	50	61
Thermal treatment and combustion residues		19	19
Municipal hazardous waste (other)		74	74
Totals	**76,655**	**93,049**	**169,704**

(Source: IPPC PRTR annual returns; hazardous waste treatment survey; recovery organisations survey for WEEE)

[73] 'On-site at industry' refers to hazardous waste recovered or disposed on-site at the industrial facility where it was generated, under IPPC licence.

[74] 'Off-site in Ireland' refers to waste sent to EPA-licensed commercial hazardous waste treatment facilities in Ireland for recovery or disposal.

Table 29 identifies the reported recovery and disposal classes for hazardous waste managed in Ireland.

Table 29: Methods of treatment of hazardous waste in Ireland in 2010 (excluding contaminated soil)

Recovery / Disposal Code[75]	Disposal or recovery activity	[76]On-site at industry (tonnes)	[77]Off-site in Ireland (tonnes)	Total (tonnes)
D1	Landfill	17,057		17,057
D8	Biological treatment	1,745		1,745
D9	Physico-chemical treatment	121	33,896	34,017
D10	Incineration	18,237		18,237
	Sub-total disposal	**37,160**	**33,896**	**71,057**
R1	Use as fuel	11,634		11,634
R2	Solvent recovery	27,352	25,227[78]	52,579
R3	Organic substance recovery	327	40	367
R4	Metal recovery		1,418	1,418
R5	Inorganic substance recovery		5,423	5,423
R4/R5	Combination of R4 and R5		301	301
R9	Oil recovery	181	24,143	24,324
R4/R9	Combination of R4 and R9		2,059	2,059
D13/R13	Combination of D13 and R13		541[79]	541
	Sub-total recovery:	**39,495**	**59,152**	**98,647**
	Total (t):	**76,655**	**93,049**	**169,704**

(Source: IPPC PRTR annual returns; hazardous waste treatment survey, recovery organisations survey for WEEE)

9.3 Hazardous waste exported for treatment

Tables 30 and 31 provide information on the export of hazardous waste in 2010. There was a 5% decrease in the quantity of hazardous waste exported for treatment in 2010 compared to 2009.

Of note is the increase in the export of batteries in 2010 compared to 2009. The tonnage of lead acid batteries exported increased by 20% compared to 2009 and the tonnage of batteries (small, non-lead acid) exported increased by 88% compared to 2009. This reflects the increased collection of batteries under the Waste Management (Batteries and Accumulators) Regulations (S.I. No. 268 of 2008), which came into effect September 2008.

A reported 25,010 t of waste solvent was blended at EPA licensed hazardous waste treatment facilities in Ireland in 2010, prior to being exported as a waste for use as fuel in cement kilns and incineration abroad (Table 30).

[75] See Appendix G for list of recovery and disposal operations.
[76] 'On-site at industry' refers to hazardous waste recovered or disposed on-site at the industrial facility where it was generated.
[77] 'Off-site in Ireland' refers to waste sent to commercial hazardous waste treatment facilities in Ireland for recovery or disposal.
[78] This figure is made up of 24,568 t (solvent waste blended prior to its export as waste for use as fuel in cement kilns) plus a further 660 t of waste solvent which was recovered and sold as product.
[79] This 541 t (includes: 534 t of non-halogenated solvent and 4 t of aqueous washing liquids and mother liquors) represents the blending and storage of mixed solvents and aqueous liquids prior to their export for use as fuel as well as incineration.

Table 30: Categories of reported exports of hazardous waste, 2007-2010

Category	Exported (tonnes) 2007	Exported (tonnes) 2008	Exported (tonnes) 2009	Exported (tonnes) 2010
Solvents	48,671	58,611	52,370	48,682
Solvents (halogenated, where specified)	6,743	8,693	4,540	1,893
Oil waste (mineral oil)	617	230	2,443	2,363
Industrial hazardous waste (other)	33,854	33,154	11,927	3,397
Healthcare risk waste	478	728	734	712
Oily sludges	7	107	94	45
Lead-acid batteries	10,565	11,050	11,832	14,805
Equipment (electrical, electronic, mechanical)	6,423	7,386	8,410	11,897
Chemical waste (other)	4,091	3,559	3,701	7,780
Paint, ink and varnish waste (including packaging)	2,805	4,843	4,834	5,459
Acid and alkali waste	2,384	2,917	2,578	1,556
Asbestos waste	6,168	7,007	14,068	9,512
Aqueous washing liquids and mother liquors (07 __ 01*)	10,747	5,278	10,647	12,637
Solid wastes from MFSU of pharmaceuticals (07 05 13*)	3,790	2,534	1,956	3,982
Sludges and filter cakes	5,036	6,057	3,834	3,663
Batteries (small, non-lead acid)	328	228	223	1,863
Packaging (contaminated or containing residues)	785	746	664	867
Photographic chemical waste	680	650	432	221
Oil filters	640	1,092	741	739
Construction and demolition waste (hazardous)	82	137	12,892	9,137
Metal and heavy metal containing waste	42	71	69	181
Agricultural hazardous waste			72	
Absorbents, wiping cloths etc. (EWC 15 02 02*)	1,894	1,373	661	596
Fluorescent lamps	116	56	74	58
Pesticides, herbicides	71	71	56	30
Laboratory and general chemical waste	332	193	485	548
Salts and saltcake				2
Thermal treatment and combustion residues	32	428	59	89
Medicines	1	3		
Municipal hazardous waste (other)	89			437
Polychlorinated biphenyls	71		1	29
Total	**147,542**	**157,207**	**150,395**	**143,179**

(Source: NTFSO survey)

Table 31: Disposal and recovery of reported export of hazardous waste, 2010

Disposal (D) or recovery (R) code[80]	Exported (t)
D1	6,844
D10	32,397
D14	36
D5	2,743
D6	630
D8	1,450
D8/D9	19
D9	1,326
Sub-total hazardous waste exported for disposal	**45,445**
R1	14,698
R1/R3	152
R1/R3/R4	411
R1/R3/R5	116
R1/R4	680
R1/R4/R5	1,077
R1/R5	200
R12	2,659
R13	10,749
R2	17,264
R2/R3	3,336
R2/R3/R4	186
R3	8,466
R3/R4	5,667
R4	24,880
R3/R5	7
R4/R5	115
R5	2,571
R6	781
R9	3,719
Sub-total hazardous waste exported for recovery	**97,735**
Total hazardous waste exported for treatment	**143,180**

(Source: NTFSO survey)

9.4 Hazardous waste treatment at IPPC licensed facilities

While the quantity of hazardous waste exported for treatment abroad decreased in 2010 compared to 2009, the quantity of hazardous wastes recovered or disposed on-site at IPPC-licensed facilities increased by 3% to 76,655 t in 2010 from 74,668 t in 2009 (Table 33).

[80] See Appendix G for a descriptive list of recovery and disposal operations.

Table 33: Treatment of hazardous waste on-site at IPPC-licensed facilities in 2010 (excluding contaminated soil)

Facility name	IPPC Reg No.	Waste Type	Recovery/ Disposal Code[81]	Quantity treated (tonnes)
Arran Chemical Co Ltd	P0110-02	Solvents	R2	528
Astellas Ireland Co. Ltd	P0007-03	Solvents	D10	562
			D10	1,404
Aughinish Alumina Ltd	P0035-04	Salts and salt cake	D1	17,057
Cognis Ireland Ltd	P0052-02	Other industrial hazardous waste	R1	4,144
Conoco Phillips	P0419-01	Oil waste (mineral oil)	R9	180
DIS Enbi Seals Ireland Ltd	P0064-01	Oil waste (mineral oil)	R9	0.8
Eli Lilly	P0009-03	Solvents	D10	9,299
			R2	315
		Solvents (Halogenated where specified)	D10	83
Irish Industrial Explosives Ltd.	P0055-01	Other industrial hazardous waste	D10	3
Liebherr Container Cranes Ltd	P0146-02	Paint, ink, varnish	R3	5.7
Mallinckrodt Medical Imaging	P0050-02	Solvents	D8	384
			R2	7,181
		Solvents (Halogenated where specified)	D8	<0.1
			D9	121
Merck Sharp & Dohme	P0011-03	Solvents	D8	1,019
			R2	1,807
Millipore Ireland Limited	P0571-02	Solvents	R2	1,287
Novartis Ringaskiddy Ltd	P0006-03	Other industrial hazardous waste	D10	<0.1
		Packaging (contaminates or containing residues)	D10	24
		Sludges and filter cakes	D10	0.3
		Solvents	D10	<0.1
			D8	336
			R1	1,736
			R2	7,046
		Absorbents, Wiping cloths	D10	22
		Aqueous washing liquids and mother liquors (07__01*)	D10	280
		Solid wastes from MFSU of pharmaceuticals (07 05 13*)	D10	0.5
		Laboratory and general chemical waste	D10	11
Pfizer Ireland Pharmaceuticals	P0013-04	Solvents	R2	4,913
Pfizer Cork Limited	P0103-02	Solvents	R2	6
Roche Ireland Limited	P0012-04	Solvents	R1	1,430
		Solvents (Halogenated where specified)	R1	2,087
Schering-Plough (Ireland)	P0015-04	Solvents	R1	691
			R2	22
Smithkline Beecham (Cork) Limited	P0004-03	Solvents	D10	2,718
			R1	1,453
			R2	660
		Solvents (Halogenated where specified)	D10	93
			R1	93
Swords Laboratories	P0014-04	Solvents	D8	0.3
			R2	592
		Solvents (Halogenated where specified)	D8	0.3
			R2	300
Bristol Myers Squibb Cruiserath	P0552-02	Solvents	R2	1,248
		Solvents (Halogenated where specified)	D10	3,738
			D8	5.6
			R2	175
Temmler Ireland Ltd	P0813-01	Solvents	R2	1,272
		Solid wastes from MFSU of pharmaceuticals (07 05 13*)	R3	322
			Total	**76,655**

(Source: IPPC PRTR and Annual Environmental Reports)

[81] See Appendix G for a descriptive list of recovery and disposal operations.

Figure 17 and Table 34 provide information on the destination and fate of hazardous waste exported from Ireland in 2010 for treatment at authorised facilities abroad. Records on the authorised export of hazardous waste were obtained from the National TFS Office. Four European countries (Great Britain, Belgium, German and Netherlands) received 91% of Irish hazardous waste exports in 2010.

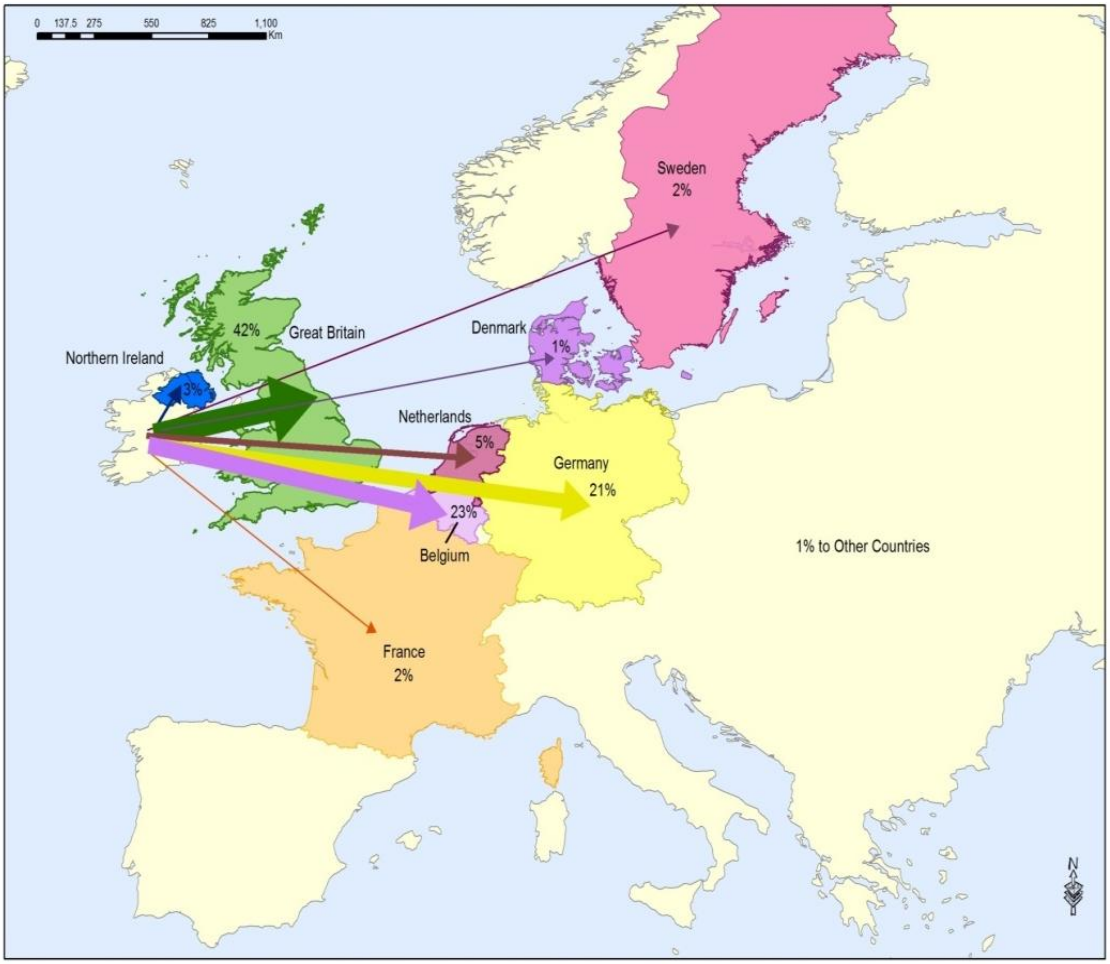


Figure 17: Destination of exported hazardous waste, 2010 (excluding contaminated soil)

Table 34: Destination and fate of notified hazardous waste exports (excluding contaminated soil), 2010

Destination	Disposal[82]		Recovery[111]		Total Exports
	D Code	(t)	R Code	(t)	(t)
Belgium	D10	5,188	R1	12,349	
	D6	630	R1/R3/R5	116	
	D9	425	R1/R4/R5	381	
			R12	1,093	
			R13	9,853	
			R2	75	
			R4	2,976	
			R4/R5	115	
			R5	14	
			R6	216	
Total Belgium (t)		**6,243**		**27,187**	**33,430**
Germany	D1	6,844	R1	242	
	D10	13,819	R1/R4	276	
	D5	2,577	R1/R4/R5	696	
	D8	1,450	R1/R5	200	
	D9	822	R12	656	
			R13	896	
			R2	324	
			R2/R3/R4	186	
			R3	48	
			R3/R4	1,115	
			R4	480	
			R5	222	
			R6	26	
Total Germany (t)		**25,512**		**5,367**	**30,879**
Denmark	D10	1,314			
Total Denmark (t)		**1,314**			**1,314**
Finland	D10	451			
Total Finland (t)		**451**			**451**
France	D10	1,454	R1	1,229	
			R4	479	
Total France (t)		**1,454**		**1,708**	**3,162**
Korea			R4	446	
Total Korea				**446**	**446**
Netherlands	D14	36	R1	878	
	D8/D9	19	R1/R3	152	
	D9	79	R1/R3/R4	411	
			R1/R4	404	
			R12	910	
			R2	42	
			R3	8	
			R3/R4	869	
			R4	238	
			R5	812	
			R9	1,686	
Total Netherlands (t)		**135**		**6,411**	**6,546**
Poland			R4	114	
Total Poland (t)				**114**	**114**
Great Britain	D10	10,170	R2	16,823	
			R2/R3	3,336	
			R3	7,830	
			R3/R4	3,683	
			R3/R5	7	
			R4	14,422	
			R5	912	
			R6	539	
			R9	2,033	
Total UK (t)		**10,170**		**49,585**	**59,755**
Northern Ireland	D5	166	R3	581	
			R4	3,136	
			R5	612	
Total Northern Ireland		**166**		**4,329**	**4,494**
USA			R4	115	
Total USA (t)				**115**	**115**
Sweden			R4	2,473	
Total Sweden (t)				**2,473**	**2,473**
Overall totals (t)		**45,445**		**97,735**	**143,180**

(Source: NTFSO survey)

[82] See Appendix G for list of recovery and disposal operations.

9.5 Hazardous waste imported for treatment

In 2010, 3,269 t of oil-related waste was imported for recovery at commercial hazardous waste treatment facilities in the State (Table 32).

Table 32: Origin and fate of notified hazardous waste imports, 2010

Country of Export	Waste Description	Disposal or Recovery operation code[80]	Total imports (t)
UK (excluding Northern Ireland)	Waste Oils/water, Hydrocarbons/water mixtures, emulsions for composition.	R9	268
Northern Ireland	Waste oil	R9	1,614
	Waste oil-mineral bases chlorinated hydraulic oils, mineral based chlorinated engine, gear and lubricating oils.	R9	1,387
(Source: NTFSO survey)			**3,269**

9.6 Contaminated soil

Table 35 outlines trends in the management of contaminated soil and export since 2005, including contaminated soil treated off-site in Ireland at commercial hazardous waste treatment facilities and contaminated soil which was exported for treatment. The data do not reflect any contaminated soil that was treated *in situ* at its point of generation. There was a 50% decrease in the treatment of contaminated soil off-site in Ireland in 2010 compared with that in 2009. All reported off-site treatment in Ireland took place at Enva Ireland Ltd's Portlaoise facility (EPA Waste Licence Register No. W0184-01). All reported exports of contaminated soils in 2010 were to Germany, accounting for 41% of the total managed. There was an increase in the reported export of contaminated soil from 476 t in 2009 to 2,590 t in 2010, however, the overall tonnage of contaminated soil managed is still significantly down on pre-2009 data, probably reflecting the lack of land development/redevelopment projects during the economic downturn.

Table 35: Reported off-site management of contaminated soil, 2004-2010

	2005	2006	2007	2008	2009	2010
Off-site in Ireland (t)	**-**	**36,872 (R[83])**	**44,221(R)**	**2 (D[83]) 43,531 (R)**	**12,428 (R)**	**6,260 (R)**
Exported (total) (t)	**140,442**	**370,032**	**143,906**	**449,574**	**476**	**2,590**
Germany	120,455 (D)	341,158 (D)	126,859 (D)	285,028 (D) 135,980 (R)	7 (D)	2,590 (D)
		28,570 (R)	14,919 (R)			
Netherlands		305 (R)	2,128 (R)	12,655 (D)	469 (R)	
				15,911 (R)		
Elsewhere in Europe	19,983 (D)					
Total reported (t)	**-**	**406,904**	**188,127**	**493,107**	**12,904**	**8,850**

(Source: Hazardous waste treatment survey, NTFSO survey)

[83] R is predominantly recovery or recycling; D is predominantly disposal.

9.7 National Hazardous Waste Management Plan

The Introduction of this report has background information on the National Hazardous Waste Management Plan (NHWMP). In June 2011 the EPA circulated a report on an interim review of the NHWMP for comment. This interim report reviews the NHWMP and SEA objectives and identified progress made in implementing its recommendations since its publication in 2008 up to mid-2011. All of the NHWMP recommendations are designed to reduce the environmental impact of hazardous waste. One of its purposes of the interim review of progress under the NHWMP is to monitor (in accordance with the SEA Regulations) the implementation of the Plan. Overall, the amount of hazardous waste managed is static or declining, unreported hazardous waste is very likely to have decreased (the economic downturn, implementation of WEEE, Batteries and ELV legislation, increase in number of civic amenity sites and other initiatives have assisted). All NHWMP recommendations are aimed at positively reducing the impact on the environment from hazardous waste.

In 2012 the EPA will commence the process of a review of the NHWMP (including SEA as may be necessary) with a view to establishing a viable national plan for the period 2013-2018.

10 WASTE INFRASTRUCTURE

10.1 Introduction

This section examines the provision of some key national waste infrastructure necessary for final disposal and recovery of municipal wastes. Landfills at EPA IPPC licensed activities and other industrial waste infrastructure (such as on-site incinerators) are not included in this discussion as these are not available to the general public, local authorities or merchant waste operators.

Information on national waste infrastructure and capacity cannot be easily accessed or reported for 2010 as there is currently no central national register of authorised waste activities. The EPA holds a register of licensed waste activities and Certificates of Registration issues to local authorities. For local authority authorisations of waste activities, the Waste Permit and Certificate of Registration Database[84] (which is a register of waste collection permits, waste facility permits and certificates of registration issued by local authorities under the 2007 Waste Collection and Waste Facility permit Regulations) is incomplete as not all local authorities have been keeping the database up-to-date. In addition, the database does not include permits issued under the 'old' 2001 Regulations. The evolution of the e-reporting systems for waste collection permit data has necessitated the compilation of a master list of waste facilities and this master list is currently undergoing checks for duplicates etc. It is anticipated that the NWCPO at Offaly Co. Co. (competent authority for waste collection permit authorisations from 1st February 2012) will take responsibility for the maintenance of this master list during 2012/2013 as the NWCPO commences its permitting function. The EPA would strongly support any initiatives which support a national register of waste treatment facilities and capacity in the State, as the European Commission calls on such data under various legislative reporting obligations (e.g. Waste Statistics Regulation).

10.2 Municipal landfill

A total of 28 municipal landfills accepted 1,495,565 t of municipal solid waste (MSW) for disposal in 2010. The market share for merchant private and public sector landfill activities for municipal waste is set out in Table 36.

Table 36: Market share of public and private landfills operating in 2010

Year: 2010	Number of merchant MSW landfills[85]	Household waste market disposed to private sector landfills	Commercial waste market disposed to private sector landfills	MSW disposal market served by private sector landfills	MSW recovery to private sector landfill	Merchant national landfill for industrial waste served by private sector (from Appendix E)	Merchant national landfill disposal (all classes bar C&D and Clonbulloge) served by private sector (from Appendix E)
	6 private sector	36%	64%	47%	76%	80%	48%
	22 local authority						

(Source: Landfill survey)

[84] See www.wastepermit.ie.
[85] Excluding Clonbullogue Ash Depository and Murphy Concrete Manufacturing Ltd.

Across all facilities, 17,232 t of municipal waste was used in a recovery capacity (wood chip and composted/stabilised organics used for cover, landscaping, etc.). Off-specification compost and trommel fines used for daily cover that do not meet EPA stability standard are not classed as recovery.

The 1,495,565 t of municipal waste disposed in the MSW landfills consisted of 843,842 t of household waste, 633,010 t of commercial waste and 18,713 t of municipal sweepings and parks waste (Appendix E). Residual household waste disposed to landfill decreased by 20 % in 2010 (from 2009), and commercial (and non-process industrial) wastes disposed to landfill in 2010 was 1% less than that reported for 2009. Total residual municipal waste disposed to landfill in 2010 fell 13% on that disposed in 2009. In 2010 23,341 t of 'municipal type' waste were repatriated from illegal landfills in Northern Ireland to authorised facilities in the Republic (refer Appendix E). This amount is not considered with the general 2010 MSW arisings and landfill statistics as it is a once-off 'special case' historic material.

Table 36 shows the breakdown of waste accepted at merchant private and public sector landfills. A more detailed breakdown of waste accepted at all landfills in operation is also provided in Appendix E. A list of closed landfills with waste infrastructure operational at the site in 2010 (composting facility, civic amenity site, waste transfer station) is provided in Appendix F.

10.3 Municipal landfill disposal capacity

At the end of 2010, the remaining capacity of fully consented MSW landfill capacity (i.e. with waste licence and planning permission in place) was approximately 18 Mt nationally (Table 38). This estimate includes one consented facility that has yet to commence waste acceptance operations (Bottlehill Landfill in Cork County Council area (EPA licence register no. W0161-02)), and contributes a potential 5.4 Mt to this national reserve capacity figure. Fingal County Council announced in December 2011 that they would not be proceeding with development of the Fingal Landfill, Nevitt site (EPA licence register no. W0231-01), which removed 9.4 Mt disposal capacity.

A breakdown of MSW disposal capacity by landfill and waste planning region is also shown in Table 38 and illustrated in Figure 18. Of the resultant 18 Mt operational municipal landfill capacity nationally, 43% of this is owned by just four private sector landfills (three of which are owned by one operator). If disposal to MSW landfill were to continue at the 2010 rate of approximately 1.5 Mt per annum, this means that there is approximately 12 years consented municipal waste landfill capacity remaining, i.e. enough capacity to last to c. 2022. Significantly, this capacity is not distributed evenly around the State. Some regions such as Donegal are at critical capacity shortage stage (Donegal is expected to have no residual municipal landfill capacity by mid-2012). However, such predictions must be treated with caution as they are affected by numerous factors including, changing character of waste, higher recycling targets, pre-treatment obligations, commencement of incineration, new applications for landfill void in application process etc. If the Cork County Council Bottlehill landfill does not proceed to development stage, then the available MSW void nationally will last for c. 8 years at current waste generation and landfill disposal rates.

In infrastructure delivery terms, it can take 8 years or more for a new MSW landfill proposal for a greenfield site to progress from site selection stage to being open for business (assuming success at planning and licensing stages). Shorter provision periods can be expected for major extensions of existing licensed facilities. The number of landfills is expected to continue to decline, with 15 of the currently 28 active MSW disposal facilities expected to close in the next three years (unless extensions are applied for and then granted). It is likely that this contraction will lead to significant inter-regional movement of waste.

Table 37: Municipal waste landfills operating in 2010

EPA licence reg. no.[86]	Landfill	Waste management planning region	Household waste disposed (t) (A)	Cleansing waste disposed (t) (B)	Commercial waste disposed (t) (C)	MSW disposal to landfill (t) (A+B+C)	Municipal organic waste (stabilised waste and woodchip) recovered to landfill (t)
W0001-04	North Kerry	Clare Limerick Kerry	16,848	1,321	2,586	20,755	304
W0017-04	Gortadroma	Clare Limerick Kerry	75,294	519	32,928	108,741	0
W0109-02	Central Waste Management Facility	Clare Limerick Kerry	13,813	841	6,137	20,791	853
W0059-03	Ballaghaderreen	Connaught	170	20	43,960	44,150	0
W0067-02	Rathroeen	Connaught	0	0	0	0	53
W0178-02	East Galway Residual	Connaught	43,024	1,439	53,820	98,283	2,942
W0068-03	Youghal	Cork	38,330	0	2,049	40,380	1,752
W0089-02	Derryconnell	Cork	2,945	0	31	2,976	0
W0024-04	Ballynacarrick	Donegal	14,569	304	7,511	[87]50,724	0
W0004-04	Arthurstown	Dublin	153,242	0	38,311	191,553	0
W0009-03	Balleally	Dublin	40,463	236	11,589	52,288	0
W0047-02	Kerdiffstown	Kildare	768	0	2,893	3,661	0
W0081-03	KTK Landfill Ltd	Kildare	1,720	0	0	1,720	996
W0201-03	Drehid Waste Management Facility	Kildare	177,960	207	140,928	319,096	0
W0026-03	Kyletalesha	Midlands	10,970	456	38,243	49,669	0
W0028-03	Ballydonagh	Midlands	15,184	335	6,908	22,428	0
W0029-04	Derryclure	Midlands	10,922	0	5,951	16,873	0
W0021-02	Derrinumera	Connaught	32,683	1,193	938	34,813	342
W0078-03	Ballaghveny	Midlands	14,517	531	1,931	16,978	7
W0020-02	Scotch Corner	North East	18,666	671	11,875	31,212	0
W0060-03	Whiteriver	North East	13,399	5,450	13,203	32,052	0
W0077-03	Corranure	North East	2,360	16	1,692	4,067	0
W0146-02	Knockharley	North East	50,961	100	109,152	160,213	50
W0025-03	Powerstown	South East	4,776	2,401	338	7,515	0
W0030-02	Dunmore	South East	543	173	285	1,001	0
W0074-03	Donohill	South East	8,057	918	215	9,190	491
W0191-02	Holmestown	South East	29,993	794	1,815	32,602	1,180
W0066-03	Rampere	Wicklow	25,941	773	1,294	28,007	0
W0165-02	Ballynagran	Wicklow	25,726	17	96,428	122,171	8,263
		Total	**843,842**	**18,713**	**633,010**		
					TOTAL MSW disposed to landfill:	**1,495,568**	
						TOTAL MSW recovered to landfill	**17,232**
						TOTAL MSW to landfill:	**1,512,800**

(Source: Landfill survey)

[86] Shaded cells are private sector MSW landfills.

Table 38: National MSW landfill disposal capacity (at end of 2010)

EPA Licence Reg. No.[88]	Licensee	Landfill	Waste Management Planning Region	Approximate remaining disposal capacity (t)[89]	Approximate remaining life expectancy[909192] (years)	
					Site	Region
W0001-04	Kerry Co Co	North Kerry	Clare Limerick Kerry	638,320	30	12
W0017-04	Limerick Co. Co.	Gortadroma	Clare Limerick Kerry	160,000	7	
W0109-02	Clare Co. Co.	Central Waste Management Facility	Clare Limerick Kerry	34,000[93]	0	
W0021-02	Mayo Co. Co.	Derrinumera	Connaught	14,000	0	3
W0059-03	Roscommon Co. Co.	Ballaghaderreen	Connaught	0	0	
W0067-02	Mayo Co. Co.	Rathroeen	Connaught	180,000	6	
W0178-02	Greenstar Holdings Ltd	Connaught Reg.	Connaught	500,000	5	
W0012-03	Cork City Co.	Kinsale Road	Cork	0	0	(34)
W0068-03	Cork Co. Co .	Youghal	Cork	20,000	1	
W0089-02	Cork Co. Co.	Derryconnell	Cork	0	0	
W0161-02	Cork Co. Co.	Bottlehill	Cork	*5,392,000*	Not operational yet	
W0024-04	Donegal Co. Co.	Ballynacarrick	Donegal	35,000	1	<1
W0004-04	South Dublin Co Co	Arthurstown	Dublin	0	0	1
W0009-03	Fingal Co. Co.	Balleally	Dublin	120,000	2	
W0047-02	Neiphin Trading Ltd	Kerdiffstown	Kildare	0	0	4
W0081-03	KTK Landfill Ltd	KTK	Kildare	0[94]	0	
W0201-03	Bord na Móna plc	Drehid Waste Management Facility	Kildare	3,644,500	11	
W0026-03	Laois Co. Co.	Kyletalesha	Midlands	243,588	5	~12
W0028-03	Westmeath Co. Co.	Ballydonagh	Midlands	0	0	
W0029-04	Offaly Co. Co.	Derryclure	Midlands	934,000[95]	31	
W0078-03	North Tipp Co. Co.	Ballaghveny	Midlands	131,044	8	
W0020-02	Monaghan Co. Co.	Scotch Corner	North East	250,000	8	11
W0060-03	Louth Co. Co.	Whiteriver	North East	650,000	19	
W0077-03	Cavan Co. Co.	Corranure	North East	150,000	3	
W0146-02	Greenstar Holdings Ltd	Knockharley	North East	1,945,095	12	
W0025-03	Carlow Co. Co.	Powerstown	South East	134,524	16	11
W0030-02	Kilkenny Co. Co.	Dunmore	South East	0	0	
W0074-03	South Tipp Co. Co.	Donohill	South East	30,000	3	
W0191-02	Wexford Co. Co.	Holmestown	South East	827,201	25	
W0066-03	Wicklow Co. Co.	Rampere	Wicklow	100,000	4	8
W0165-02	Greenstar Holdings Ltd	Ballynagran	Wicklow	1,504,875	12	
			Total	17,638,147	**12**[96]	

[88] Shaded cells are private sector MSW landfills.
[89] Based on AER returns from landfill operators for 2010.
[90] Based on 2010 fill rate (2009 for Rathroeen Landfill W0067-02).
[91] Remaining lifespan assumes constant MSW, industrial and other waste input as that recorded in 2010.
[92] The predicted completion year of closure of all landfills (if sites are fully developed) is subject to disposal rate change.
[93] Central Waste Management Facility (W0109-02) took in c. 34,000 t from December 2010 to its closure at the end of November 2011.
[94] No MSW accepted for disposal in 2010, facility closed.
[95] Derryclure Landfill (W0029-04) has ceased landfilling in 2011 with the activity being mothballed for time being. Planning and authorisation are in place should landfilling be reconsidered in the future.
[96] This is calculated by dividing the total remaining disposal capacity by total MSW reported as disposed to landfill in 2010. This is only an estimate and assumes no change to disposal rate.

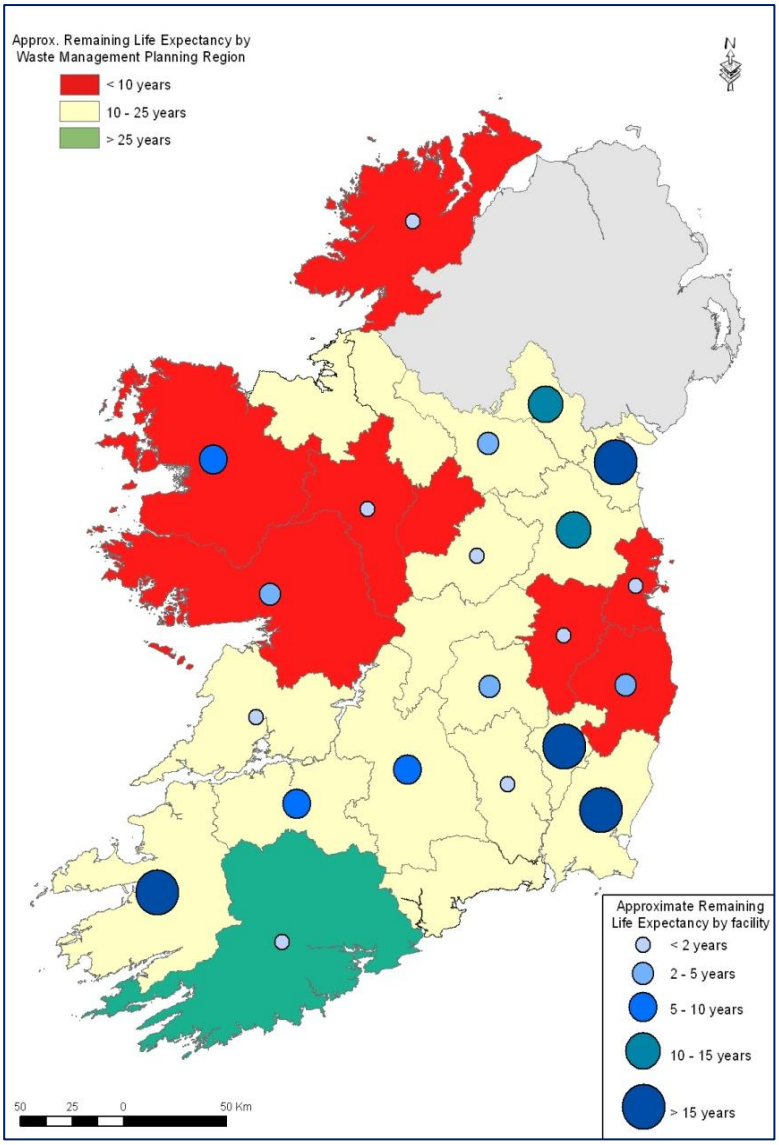


Figure 18: Remaining life expectancy and location of landfills by Waste Management Planning Region

10.4 Integrated landfill facilities

Twenty-eight landfills accepted municipal waste for disposal and recovery in 2010. Bottlehill Landfill, Cork County Council (EPA licence register no. W0161-02) has yet to commence waste acceptance operations and Fingal Landfill, Nevitt (EPA licence register no. W0231-01) site will not be proceeding with development.

Of the surveyed landfills for NWR 2010, twenty one landfills are closed to landfill activities and fifteen of these have other non-landfill associated waste infrastructure (see Appendix F). Of the surveyed closed landfills, 16 had other waste infrastructure (15 civic amenity sites; 3 composting; and 3 have associated transfer/baling operations transfer facilities). None of the private municipal landfills offered civic amenity facilities, or reported composting on-site.

Twenty-one of the 28 active landfills (i.e. receiving municipal waste to the landfill void) have other non-landfill associated waste infrastructure (13 had civic amenity sites only; one had civic amenity and composting facilities; one had composting only).

10.5 Hazardous waste landfill

Ireland currently has no dedicated hazardous waste landfill disposal facility. East Galway Residual Landfill is licensed to accept certain types of asbestos waste for disposal but has not accepted any such waste to date. KTK Landfill Limited previously accepted asbestos waste for disposal but such acceptance has ceased at this facility since 2008.

Murphy Environmental Hollywood Ltd, operator of an industrial waste facility at The Naul, Co. Dublin (EPA licence register no. W0129-02) submitted an application for a licence review in December 2010, which includes the development of a hazardous waste facility for the engineered landfill of contaminated soil and fly-ash containing dangerous substances. This licence application is being processed by the EPA, and Planning Permission has been granted by An Bord Pleanala.

10.6 Thermal treatment (including incineration)

Incineration of municipal waste

Commercial incineration of municipal waste commenced in late 2011 at Indaver Ireland's Carranstown, Co. Meath site (W0167-01), currently consented to treat up to 0.2 Mt per year. The EPA has also granted waste licences[97] for commercial incinerators to Indaver Ireland (Ringaskiddy, Co. Cork (W0186-01)) and Dublin City Council (Poolbeg (W0232-01)). Construction at the Poolbeg facility has halted, and has not commenced at the Ringaskiddy facility to date.

Use of waste as a fuel

Table 39 shows that in 2010 recovery operators reported that 182,778 t of non-hazardous waste was used as a fuel (other than in direct incineration) to generate energy in Ireland and abroad. The tonnage of refuse derived fuel combusted in 2010 was up 97% on 2009. Lagan Cement Ltd (IPPC Reg. No. P0487-05) commenced combustion of SRF at their plant in 2010 (following trials in 2009). Irish Cement Limited (IPPC Reg. No. P0030-04) (Platin works, Drogheda) was granted a review of their IPPC licence in January 2011 which included authorisation for the combustion of SRF and trials were underway during 2011. Quinn Cement Limited (IPPC Reg. No. 0378-01) has also applied for a review of their IPPC licence to include authorisation for combustion of SRF and a proposed decision on this application was issued in January 2012.

[97] Further licence details at www.epa.ie.

Table 39: Non-hazardous waste used as a fuel, 2009 and 2010

Material Type	Total (t) 2009	Of which packaging 2009 (t)	Total (t) 2010	Of which packaging 2010 (t)
Wood	72,586	21,834	69,310	16,833
RDF/SRF	47,818	26,262	94,174	48,513
Edible oil and fats	4,018	0	146	0
Other non-hazardous wastes	26,405	0	19,147	105
Total	**150,826**	**48,096**	**182,777**	**65,451**

(Source: Recovery organisations survey)

10.7 Civic amenity site and bring bank infrastructure

Table 40 presents the number of bring banks and civic amenity sites operational in each local authority area between 2006 and 2010. Bring banks are unmanned, fixed receptacles for the deposit of non-hazardous, dry recyclables such as glass and beverage cans. Civic amenity sites are manned, permanent facilities for the reception of municipal (mainly household) residual and recyclable waste, and in some cases hazardous waste.

The number of bring banks decreased from 1,962 in 2009 to 1,922 in 2010. This reflects a decreasing trend since 2008. The number of bring banks can fluctuate from year to year, through consolidation of sites, availability of alternative outlets, or removal of bring banks due to illegal dumping, public complaints or antisocial behaviour. The number of civic amenity sites stayed static at 107 between 2009 and 2010 and perhaps reflects the economic situation in that local authorities do not have the budget to invest in the creation of civic amenity sites.

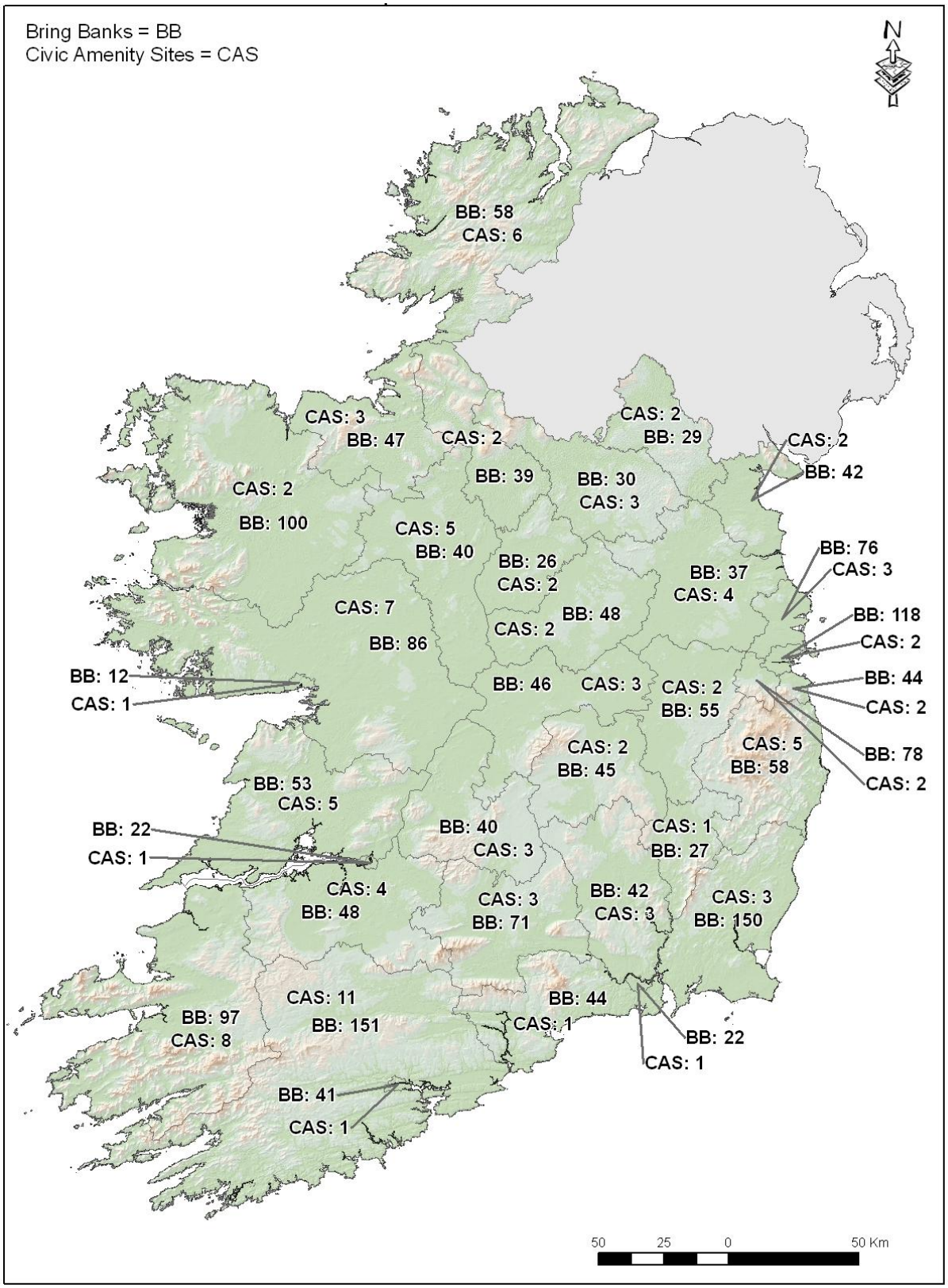
Household waste brought to bring banks and civic amenity sites accounted for 20% of managed household waste, which emphasises the importance of this infrastructure and the need to support it.

Table 40: Number and tonnages collected at bring banks and civic amenity sites, 2006–2010

	2006	2007	2008	2009	2010
Number of bring banks	1,919	1,960	1,989	1,962	1,922
Collected at bring banks (t)	*96,727*	*95,569*	*102,300*	*91,800*	*82,908*
Number of civic amenity sites	86	90	96	107	107
Collected at civic amenity sites (t)	*191,399*	*203,282*	*200,455*	*177,158*	*158,303*

(Source: Local authority survey, WEEE compliance schemes)

The number of bring banks and civic amenity sites in operation in 2010 by local authority functional area are illustrated in Figure 19 below. For more information on waste accepted at bring banks and civic amenity sites, refer to Appendices B and C.



(Source: Local authority survey)

Figure 19: Bring banks and civic amenity sites by local authority functional area.

APPENDICES

APPENDIX A – INDICATORS

Indicator	2005	2006	2007	2008	2009	2010
Municipal Waste						
Municipal waste managed (t)	2,779,097	3,100,310	3,174,565	3,103,820	2,824,977	2,580,435
Municipal waste managed/person (t)	0.670	0.730	0.730	0.702	0.634	0.563
Municipal waste generated (t)[98]	3,040,714	3,384,606	3,397,683	3,224,279	2,952,977	2,846,115
Municipal waste generated/person (t)[99]	0.740	0.800	0.780	0.729	0.662	0.621
Disposal of managed municipal waste to landfill (t)	1,833,330	1,980,618	2,014,797	1,938,712	1,723,705	1,495,565
Disposal rate for managed municipal waste	66%	64%	64%	63%	61%	58%
Recovery of municipal waste (t)	945,767	1,119,692	1,159,767	1,165,108	1,101,272	1,084,870
Recovery rate for municipal waste	34%	36%	37%	38%	39%	42%
Number landfills accepting municipal waste for disposal	32	29	29	31	28	28
Number of bring banks	1,921	1,919	1,960	1,989	1,962	1,922
Number of civic amenity sites	79	86	90	96	107	107
Household waste						
Household waste managed (t)	1,543,468	1,773,242	1,625,490	1,556,879	1,498,469	1,420,706
Household waste managed/person (t)	0.370	0.420	0.370	0.352	0.336	0.310
Household waste generated (t)	1,746,408	1,978,716	1,761,167	1,677,338	1,626,469	1,686,387
Household waste generated/person (t)	0.420	0.470	0.410	0.379	0.365	0.368
Disposal of household waste to landfill (t)	1,198,504	1,379,246	1,200,980	1,155,567	1,056,267	843,842
Residual household waste disposal/person (landfill) (t)	-	-	0.277	0.261	0.237	0.184
Disposal rate for household waste	78%	78%	74%	74%	71%	59%
Recovery of household waste (t)	344,964	393,995	424,510	401,312	442,202	576,864
Recovery rate for household waste	22%	22%	26%	26%	30%	41%
Commercial waste						
Commercial waste managed (t)	1,235,629	1,327,068	1,549,075	1,477,395	1,299,807	1,141,015
Commercial waste managed/person (t)	0.300	0.310	0.360	0.330	0.291	0.249
Disposal of commercial waste to landfill (t)	634,826	601,372	813,817	758,176	640,737	633,010
Disposal rate for commercial waste	51%	45%	53%	51%	49%	55%
Recovery of commercial waste (t)	600,803	725,697	735,257	719,219	659,070	508,005
Recovery rate for commercial waste	49%	55%	48%	49%	51%	45%
Packaging waste						
Best estimate of total quantity managed (t)	925,221	1,028,472	1,055,952	1,026,759	972,458	836,714
Packaging waste managed/person (t)	0.220	0.240	0.240	0.232	0.218	0.189
Best estimate of packaging waste recovered (t)	545,368	589,519	671,630	664,043	668,733	636,933
Packaging waste recovered/person (t)	0.132	0.140	0.150	0.150	0.150	0.139
National recovery rate	59%	57%	64%	65%	70%	74%

[98] Generated municipal solid waste includes estimated uncollected household waste.
[99] Per person calculations based on CSO data (2010 data references 2011 census, i.e. 4,581,269 persons).

APPENDIX B – HOUSEHOLD WASTE COLLECTED AND BROUGHT

Local authority	Mixed/residual collection (black bins) (t)	Mixed dry recyclables collection (green bin) (t)	Organics collection (brown bins) (t)	Segregated glass collection (t)	Bring banks (t)	Civic amenity sites (t)	Household waste delivered directly to landfill face by householders (t)	Estimate of home composting (t)	Total collected and brought household waste (t)
Dublin City	92,940	31,778	16,026	50	12,330	3,586	0	4,129	**160,839**
Dun Laoghaire-Rathdown[100]	29,936	18,950	22	60	2,485	10,702	0	1,229	**63,385**
Fingal	47,136	20,319	17,268	100	4,837	7,449	0	1,020	**98,130**
South Dublin[10005]	51,956	20,806	2,907	70	4,994	14,882	N/A	1,241	**96,856**
Dublin Region Sub-total	**221,968**	**91,853**	**36,223**	**280**	**24,646**	**36,619**	**0**	**7,619**	**419,209**
Meath	38,841	7,874	160	0	1,951	3,840	0	1,295	**53,961**
Cavan	9,087	2,572	109	0	1,903	5,109	0	325	**19,105**
Louth	22,559	6,030	2,646	0	2,470	14,143	2,541	164	**50,552**
Monaghan	8,946	3,279	421	0	1,111	1,479	0	375	**15,610**
North East Region sub-total	**79,432**	**19,755**	**3,335**	**0**	**7,435**	**24,571**	**2,541**	**2,159**	**139,228**
Cork City	27,167	9,800	0	213	1,479	3,762	0	350	**42,771**
Cork County	62,343	26,164	0	3,412	7,373	15,943	252	1,146	**116,633**
Cork Region sub-total	**89,510**	**35,964**	**0**	**3,625**	**8,852**	**19,706**	**252**	**1,496**	**159,404**
Galway County	29,524	11,376	1,172	0	2,980	6,092	0	1,900	**53,043**
Galway City	10,053	4,824	5,438	0	2,184	1,426	0	60	**23,985**
Leitrim	3,381	1,336	0	0	590	485	170	560	**6,522**
Mayo	25,685	7,192	579	5	2,009	4,682	0	1,524	**41,677**
Roscommon	11,758	3,731	103	0	843	2,202	9	211	**18,858**
Sligo	10,969	1,788	25	0	1,228	1,848	350	965	**17,173**
Connaught Region sub-total	**91,370**	**30,247**	**7,317**	**5**	**9,834**	**16,735**	**529**	**5,220**	**161,258**

[100] EPA queried Dun Laoghaire Rathdown and South Dublin County Councils regarding the drop in mixed residual waste tonnages reported for 2010 for their own collections (there was no significant difference between 2009 and 2010 private sector collection tonnages) but these were not closed out at time of publication. The tonnage reported as collected at kerbside for these functional areas may be an underestimation.

Local authority	Mixed/residual collection (black bins) (t)	Mixed dry recyclables collection (green bin) (t)	Organics collection (brown bins) (t)	Segregated glass collection (t)	Bring banks (t)	Civic amenity sites (t)	Household waste delivered directly to landfill face by householders (t)	Estimate of home composting (t)	Total collected and brought household waste (t)
Clare	13,743	6,142	875	0	1,431	7,603	0	1,041	**30,836**
Kerry	17,867	6,522	497	0	3,013	8,695	1,000	1,468	**39,062**
Limerick County	15,711	6,292	1,060	0	1,652	6,714	2,448	580	**34,457**
Limerick City	15,560	4,709	259	0	981	713	0	357	**22,578**
Mid-West Region sub-total	**62,881**	**23,665**	**2,690**	**0**	**7,078**	**23,725**	**3,448**	**3,446**	**126,933**
Carlow	14,498	2,221	907	162	1,110	1,715	4,366	314	**25,293**
Kilkenny	14,045	4,386	0	0	2,039	2,953	1,474	1,144	**26,041**
South Tipperary	13,306	3,796	0	0	1,784	2,605	0	822	**22,314**
Waterford County	11,278	4,345	2,188	9	1,428	859	0	360	**20,467**
Waterford City	9,022	2,555	3,834	0	1,361	1,361	0	360	**18,492**
Wexford County	25,005	9,446	2,289	0	3,454	4,220	0	1,897	**46,311**
South East Region sub-total	**87,154**	**26,749**	**9,218**	**171**	**11,176**	**13,713**	**5,840**	**4,897**	**158,919**
Laois	12,395	3,386	100	75	1,116	1,987	0	480	**19,539**
Offaly	10,545	3,306	130	0	1,165	3,409	2,515	399	**21,469**
Longford	6,487	1,977	119	0	511	1,374	0	451	**10,919**
North Tipperary	16,197	6,079	123	0	1,313	3,501	1,597	300	**29,110**
Westmeath	18,004	3,459	1	0	1,277	2,121	1,038	937	**26,837**
Midlands Region Sub-total	**63,628**	**18,208**	**473**	**75**	**5,382**	**12,391**	**5,150**	**2,568**	**107,873**
Donegal	17,255	3,274	0	0	2,532	1,278	187	1,150	**25,676**
Kildare	50,197	12,696	4,322	32	3,866	5,008	663	2,400	**79,185**
Wicklow[101]	9.926	1,759	258	0	2,108	4,557	0	5,900	**20,046**
Non-Regional Sub-total	**77,378**	**17,729**	**4,580**	**32**	**8,507**	**10,842**	**850**	**9,450**	**124,907**
Overall total	**773,321**	**264,170**	**63,836**	**4,188**	**82,909**	**158,302**	**18,610**	**36,855**	**1,402,191[102]**

[101] The tonnage reported for Wicklow Co Co is considered an underestimate as four operators that collected household kerbside in Wicklow Co Co in 2009 failed to report 2010 data.
[102] A further 18,515 t household WEEE was collected at retail premises by the WEEE compliance schemes, giving a total 1,420,706 t household waste collected and brought.

APPENDIX C – WASTE TYPES COLLECTED AT BRING BANKS

Local authority area	Paper & cardboard (t)	Glass (t)	Aluminium cans (t)	Steel cans (t)	Plastic (t)	Composite packaging (t)	Small batteries (t)	Other[103] (t)	Total (t)
Carlow	340	697	73	0	0	0	0	0	**1,110**
Cavan	36	893	54	23	885	10	1.80	0	**1,903**
Clare	0	1,246	33	8	121	0	0	24	**1,431**
Cork City	0	1,469	10	0	0	0	0	0	**1,479**
Cork County	242	6,776	118	190	46	0	0	0	**7,373**
Donegal	0	2,354	40	118	0	0	0.74	20	**2,532**
Dublin City	1,820	9,108	32	1	0	0	0	1,369	**12,330**
Dun Laoghaire-Rathdown	0	2,466	19	0	0	0	0	0	**2,485**
Fingal	0	4,817	18	0	0	0	1.79	0	**4,837**
Galway County	0	2,875	42	63	0	0	0	0	**2,980**
Galway City	0	1,990	0	0	0	0	55.00	139	**2,184**
Kerry	0	2,555	108	225	126	0	0	0	**3,013**
Kildare	0	3,827	39	0	0	0	0	0	**3,866**
Kilkenny	100	1,762	47	69	61	0	0	0	**2,039**
Laois	0	1,082	34	0	0	0	0	0	**1,116**
Leitrim	0	561	30	0	0	0	0	0	**590**
Limerick County	0	1,522	26	94	9	0	1.32	0	**1,652**
Limerick City	0	858	27	13	84	0	0	0	**981**
Longford	0	488	19	2	0	0	0.14	1	**511**
Louth	0	1,865	75	0	530	0	0	0	**2,470**
Mayo	0	1,934	76	0	0	0	0	0	**2,009**
Meath	0	1,929	21	0	0	0	0	0	**1,950**
Monaghan	0	1,076	34	0	0	0	0	0	**1,111**
North Tipperary	0	1,290	23	0	0	0	0	0	**1,313**
Offaly	0	1,114	17	33	0	0	0	0	**1,165**
Roscommon	0	807	36	0	0	0	0	0	**843**
Sligo	0	1,182	46	0	0	0	0	0	**1,228**
South Dublin	0	4,978	16	0	0	0	0	0	**4,994**
South Tipperary	56	1,650	29	49	0	0	0	0	**1,784**
Waterford County	0	1,428	0	0	0	0	0	0	**1,428**
Waterford City	0	1,323	38	0	0	0	0	0	**1,361**
Westmeath	0	1,245	32	0	0	0	0	0	**1,277**
Wexford	184	3,180	90	0	0	0	0	0	**3,454**
Wicklow	0	2,052	46	10	0	0	0.21	0	**2,108**
Total	**2,778**	**74,398**	**1,348**	**899**	**1,861**	**10**	**61.00**	**1,553**	**82,908**

[103] Other = wood, green waste (e.g. Christmas trees), household hazardous waste, textiles unsuitable for re-use etc.

APPENDIX D – WASTE TYPES COLLECTED AT CIVIC AMENITY SITES

Local authority area	Mixed residual waste (t)	Organic waste (food & garden) (t)	Mixed dry recyclables (t)	Paper, card & magazines (t)	Glass (t)	Metals (t)	Plastic (t)	Composites (e.g. tetrapak) (t)	C&D (DIY) (t)	Wood[104] (t)	Batteries[105] (t)	Waste mineral oils & filters (t)	Waste cooking or veg. oils (t)	Paint & varnish (t)	WEEE[106] (t)	Bulky waste (t)	Household hazardous waste (t)	Other[107] (t)	Total (t)
Carlow	0	512	0	197	89	227	101	15	21	282	15	0.6	0.4	10.5	238	0	0.0	6.1	**1,714**
Cavan	2,507	510	0	584	198	212	185	16	275	298	13	9.1	1.4	0.0	301	0	0.0	0.2	**5,109**
Clare	2,452	688	0	697	1,028	742	310	14	49	686	26	23.9	0.6	6.5	581	298	0.0	0.0	**7,603**
Cork City	2,055	264	0	204	44	99	39	0	0	174	2	8.0	0.0	14.0	1,779	0	5.9	0.5	**4,688**
Cork County	4,984	1,313	402	1,897	1,046	1,172	326	0	616	1,547	57	27.3	10.2	73.3	853	694	0.0	0.0	**15,018**
Donegal	174	0	0	315	217	75	107	5	0	0	7	4.8	0.0	0.0	372	0	0.0	1.0	**1,278**
Dublin City	0	75	137	50	210	96	29	0	556	164	9	3.1	0.0	188.8	815	1,242	0.0	10.1	**3,586**
Dun Laoghaire-Rathdown	1,187	4627	0	843	581	342	176	18	455	641	30	15.0	4.0	88.2	711	974	0.0	9.4	**10,702**
Fingal	0	1045	93	356	579	358	86	7	817	999	37	23.2	2.7	147.9	1,302	1,587	2.3	8.5	**7,450**
Galway County	1,899	362	2,044	396	232	280	42	187	12	137	23	24.1	0.0	52.6	396	0	0.0	3.4	**6,091**
Galway City	0	0	0	0	21	134	84	0	0	232	13	12.0	3.5	16.4	908	0	0.0	0.0	**1,426**
Kerry	5,602	531	344	871	199	407	96	0	6	48	14	5.9	0.6	3.0	567	0	0.0	2.3	**8,696**
Kildare	2,925	230	0	280	62	210	12	0	30	24	15	3.3	0.0	0.0	393	784	26.5	12.7	**5,008**
Kilkenny	2,079	0	0	333	35	132	82	11	0	39	6	3.6	2.6	0.0	205	7	17.1	0.0	**2,953**
Laois	0	355	0	527	213	231	220	1	6	39	0	23.2	0.0	19.9	333	0	2.0	15.9	**1,987**
Leitrim	0	14	0	79	0	39	10	4	0	26	9	0.0	0.0	9.9	97	195	1.8	0.0	**485**
Limerick County	2,464	612	0	655	184	439	254	4	932	496	18	10.5	2.0	66.0	574	0	0.0	3.1	**6,714**
Limerick City	0	0	0	190	0	0	0	0	0	0	6	3.0	1.0	32.4	479	0	0.0	1.0	**713**
Longford	282	170	96	136	35	92	56	10	29	89	8	0.0	0.0	0.0	244	126	1.4	0.1	**1,374**
Louth	60	4667	0	2,632	773	299	903	0	1,778	2,159	32	4.5	5.9	3.0	827	0	0.0	17.1	**14,143**
Mayo	1,915	37	0	759	249	436	126	18	41	395	39	12.8	2.6	22.7	600	0	1.9	27.6	**4,683**
Meath	25	841	0	631	368	357	140	19	141	336	24	10.0	3.3	20.6	817	101	0.5	3.4	**3,839**
Monaghan	241	45	0	594	70	75	57	0	145	52	7	1.0	0.8	0.8	166	14	0.0	9.3	**1,479**
North Tipperary	2,045	14	0	680	37	149	70	0	0	62	6	9.6	0.0	0.0	428	0	0.0	0.4	**3,501**
Offaly	1,509	556	81	327	108	161	61	7	26	215	3	0.0	2.6	12.7	332	0	0.5	7.7	**3,409**
Roscommon	479	0	44	649	149	198	87	0	0	167	15	6.1	0.3	23.2	378	7	0.0	0.0	**2,202**
Sligo	0	761	0	310	101	102	53	8	150	35	1	2.3	0.0	0.0	323	0	0.0	0.0	**1,847**
South Dublin	3,654	2307	0	282	104	443	18	0	766	140	21	36.7	0.6	24.9	1,007	6,073	0.0	4.5	**14,882**
South Tipperary	671	23	170	97	71	192	0	0	605	353	6	2.8	0.4	2.2	376	20	0.0	15.4	**2,606**
Waterford County	111	0	110	0	7	26	0	0	49	45	0	1.1	0.7	2.5	269	238	0.0	0.2	**859**
Waterford City	323	586	0	32	55	17	0	0	0	6	3	2.2	0.8	6.6	329	0	0.0	0.0	**1,361**
Westmeath	0	541	0	436	103	183	67	15	0	271	11	7.2	0.9	4.2	480	3	0.3	0.0	**2,121**
Wexford	2,828	0	32	359	201	313	13	12	0	0	23	14.4	1.8	0.0	422	0	0.0	0.0	**4,220**
Wicklow	466	0	0	1,789	764	276	372	30	0	0	46	16.3	4.1	15.8	776	0	1.2	0.0	**4,557**
Total (t)	**42,938**	**21,684**	**3,553**	**18,190**	**8,134**	**8,514**	**4,183**	**405**	**7,505**	**10,156**	**546**	**327**	**54**	**869**	**18,678**	**12,363**	**61**	**141**	**158,303**

[104] 75% of which (in t) is home improvement/DIY source.
[105] 80% of which (in t) are lead acid.
[106] Compliance scheme data for household WEEE collected at civic amenity sites. Also a further 18,515 t household WEEE collected at retail premises.
[107] Other = tyres, aerosols, gas cylinders, books, miscellaneous recyclables, etc.

APPENDIX E – LANDFILLS IN OPERATION

	Local authority / Operator	Facility name	Waste licence Reg No.	Total waste accepted in 2009 (t)	Total waste accepted in 2010 (t)	DISPOSAL					RECOVERY		
						Household waste (t)	Commercial waste[108] (t)	Industrial waste (t)	C & D waste (t)	Municipal sweepings & parks (t)	C & D waste (t)	Organic waste[109] (t)	Other wastes (t)
1	Carlow County Council	Powerstown Landfill	W0025-03	32,983	13,663	4,776	338	1,114	0	2,401	5,033	0	0
2	Cavan County Council	Corranure Landfill	W0077-03	116,354	12,231	2,360	1,692	18	872	16	6,894	0	380
3	Clare County Council	Central Waste Management Facility	W0109-02	36,394	28,826	13,813	6,137	896	0	841	1,764	853	4,523
4	Cork County Council	Youghal Landfill	W0068-03	58,188	58,965	38,330	2,049	0	0	0	15,049	3,503	34
5	Cork County Council	Derryconnell Landfill Site	W0089-02	10,024	4,225	2,945	31	0	0	0	1,046	0	202
6	Donegal County Council	Ballynacarrick Landfill	W0024-04	35,373	31,565	14,569	7,511	1,295	82	304	7,804	0	0
7	Fingal County Council	Balleally Landfill	W0009-03	317,585	97,726	40,463	11,589	7,196	5,220	236	33,014	0	9
8	Kerry County Council	North Kerry Landfill	W0001-04	41,168	21,276	16,848	2,586	216	0	1,321	0	304	0
9	Kilkenny County Council	Dunmore Landfill	W0030-02	33,042	1,470	543	285	0	0	173	469	0	0
10	Laois County Council	Kyletalesha Landfill	W0026-03	43,052	58,289	10,970	38,243	520	0	456	8,100	0	0

[108] Includes non-process industrial waste

[109] Organic waste contains an element of shredded wood from municipal, C&D and industrial sources, also garden waste and off spec compost (stabilised). 17,232 t of this is MSW, of which 10,306 t is commercial and 6,926 t is household.

	Local authority / Operator	Facility name	Waste licence Reg No.	Total waste accepted in 2009 (t)	Total waste accepted in 2010 (t)	DISPOSAL					RECOVERY		
						Household waste (t)	Commercial waste[108] (t)	Industrial waste (t)	C & D waste (t)	Municipal sweepings & parks (t)	C & D waste (t)	Organic waste[109] (t)	Other wastes (t)
11	Limerick County Council	Gortadroma	W0017-04	108,259	117,138	75,294	32,928	104	0	519	8,259	0	34
12	Louth County Council	Whiteriver	W0060-03	112,749	41,664	13,399	13,203	2,061	0	5,450	7,551	0	0
13	Mayo County Council	Derrinumera Landfill	W0021-02	0	35,244	32,683	938	89	0	1,193	0	342	0
14	Mayo County Council	Rathroeen Landfill	W0067-02	31,556	649	0	0	596	0	0	0	53	0
15	Monaghan County Council	Scotch Corner Landfill	W0020-02	46,376	33,789	18,666	11,875	1,004	5	671	1,568	0	0
16	North Tipperary County Council	Ballaghveny Landfill	W0078-03	21,442	17,044	14,517	1,931	30	30	531	0	7	0
17	Offaly County Council	Derryclure Landfill	W0029-04	35,873	51,332	10,922	5,951	536	295	0	33,628	0	0
18	Roscommon County Council	Ballaghaderreen Landfill	W0059-03	45,834	48,779	170	43,960	68	292	20	4,269	0	0
19	South Dublin County Council	Arthurstown Landfill	W0004-04	214,770	255,379	153,242	38,311	0	0	0	63,826	0	0
20	South Tipperary County Council	Donohill Landfill	W0074-03	14,236	15,271	8,057	215	1,551	0	918	532	491	3,507
21	Westmeath County Council	Ballydonagh Landfill	W0028-03	56,194	23,993	15,184	6,908	0	0	335	1,034	0	531
22	Wexford County Council	Holmestown Landfill	W0191-02	28,728	33,782	29,993	1,815	0	0	794	0	1,180	0
23	Wicklow County Council	Rampere Landfill	W0066-03	60,788	31,630	25,941	1,294	117	0	773	3,507	0	0

	Local authority / Operator	Facility name	Waste licence Reg No.	Total waste accepted in 2009 (t)	Total waste accepted in 2010 (t)	DISPOSAL					RECOVERY		
						Household waste (t)	Commercial waste[108] (t)	Industrial waste (t)	C & D waste (t)	Municipal sweepings & parks (t)	C & D waste (t)	Organic waste[109] (t)	Other wastes (t)
24	Bord Na Mona	Clonbullogue Ash Repository	W0049-02	34,007	32,157	0	0	32,157	0	0	0	0	0
25	Bord Na Mona plc	Drehid Waste Management Facility	W0201-03	277,375	418,243	177,960	140,928	1,532	7,763	207	89,030	0	823
26	Greenstar Holdings Ltd.	Knockharley Landfill	W0146-02	199,822	198,365	50,961	109,152	1,167	155	100	3,668	50	33,112
27	Greenstar Holdings Ltd.	East Galway Residual Landfill	W0178-02	104,563	108,544	43,024	53,820	3,455	0	1,439	1,383	2,942	2,481
28	Greenstar Holdings Ltd.	Ballynagran Residual Landfill	W0165-02	175,112	169,475	25,726	96,428	8,363	0	17	1,466	8,263	29,212
29	KTK Landfill Ltd.	KTK Landfill Limited	W0081-03	143,710	57,654	1,720	0	23,226	0	0	4,734	1,831	26,143
30	Murphy Environmental Hollywood Ltd	Murphy Environmental Hollywood Ltd	W0129-02	42,206	30,626	0	0	789	29,837	0	0	0	0
31	Murphy Environmental Hollywood Ltd	Murphy Concrete Manufacturing Ltd	W0151-01	352,319	151,477	0	0	0	0	0	151,477	0	0
32	Neiphin Trading Ltd.	Kerdiffstown	W0047-02	-	3,731	768	2,893	0	71	0	0	0	0
				Total	**2,204,199**	843,842	633,010	88,099	44,621	18,713	455,104	19,818	100,991
								Total Disposal[110]		1,628,285[111]	**Total Recovery**		575,913

Landfills that accepted waste for disposal in 2009 but not in 2010:	Kinsale Road Landfill, Cork (W0012-02)

[110] Total municipal waste disposed= 1,495,565 t (843,842 t household waste + 633,010 t commercial waste + 18,713 t municipal sweepings and parks).
[111] In addition, operators reported exporting 6,809 t of municipal waste abroad for disposal in 2010 (e.g. D10 incineration without energy recovery).

APPENDIX F – CLOSED LANDFILLS WITH ASSOCIATED WASTE INFRASTRUCTURE

	Operator	Facility name	Waste licence Reg No.	Associated waste infrastructure operational in 2010
1	Wicklow	Ballymurtagh	W0011-01	Civic amenity site
2	Cork City	Kinsale Road	W0012-02	Civic amenity site & composting facility
3	Galway City	Carrowbrowne	W0013-01	Composting facility
4	Kildare	Silliot Hill	W0014-01	Civic amenity site, waste transfer station
5	Dun Laoghaire Rathdown	Ballyogan	W0015-01	Civic amenity site
6	Waterford County	Kilbarry	W0018-01	Civic amenity site
7	Cork County	East Cork	W0022-02	Civic amenity site
8	Cork County	Raffeen	W0023-02	Civic amenity site
9	Ballinasloe Town Council	Pollboy	W0027-02	Civic amenity site
10	Westmeath	Ballydonagh	W0028-03	Landfill closed 31 July 2010. Civic amenity site
11	Kilkenny	Dunmore	W0030-02	Civic amenity site
12	Waterford County	Dungarvan	W0032-02	Civic amenity site, waste transfer station
13	Drogheda Borough Council	Drogheda Landfill	W0033-01	Civic amenity site
14	Dundalk Town Council	Dundalk Landfill & Civic Waste Facility	W0034-02	Civic amenity site & composting facility
15	Roscommon County	Ballaghaderreen Landfill	W0059-02	Civic amenity site
16	Cork County	Derryconnell	W0089-02	Civic amenity site

APPENDIX G – RECOVERY AND DISPOSAL OPERATIONS

Table G-1 Disposal and recovery operations as per Annex II A and B of Directive (2008/98/EC)[112] on waste

Code	Disposal operations	Code	Recovery operations
D1	Deposit into or onto land (e.g. landfill, etc.)	R1	Use principally as a fuel or other means to generate energy
D2	Land Treatment (e.g. biodegradation of liquid or sludgy discards in soils etc.)	R2	Solvent reclamation/regeneration
D3	Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories etc.)	R3	Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)
D4	Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons etc.)	R4	Recycling / reclamation of metals and metal compounds
D5	Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment etc.)	R5	Recycling / reclamation of other inorganic materials
D6	Release into a water body except seas / oceans	R6	Regeneration of acids or bases
D7	Release into seas/oceans including sea-bed insertion	R7	Recovery of components used for pollution abatement
D8	Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D7 and D9 to D12	R8	Recovery of components from catalysts
D9	Physico chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D8 and D10 to D12 (e.g. evaporation, drying, calcination etc.)	R9	Oil re-refining or other reuses of oil
D10	Incineration on land	R10	Land treatment resulting in benefit to agriculture or ecological improvement
D11	Incineration at sea	R11	Use of wastes obtained from any of the operations numbered R1 to R10
D12	Permanent storage (e.g. emplacement of containers in a mine, etc.)	R12	Exchange of wastes for submission to any of the operations numbered R1 to R11
D13	Blending or mixing prior to submission to any of the operations numbered D1 to D12	R13	Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)
D14	Repackaging prior to submission to any of the operations numbered D1 to D13		
D15	Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where it is produced)		

[112] As transposed into national legislation by European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011).

APPENDIX H – WASTE COMPOSITION & BIODEGRADABILITY FACTORS

Table H-1: Collected household waste composition profile (% by weight)

Waste streams	Mixed residual waste (black bin)[113]	Mixed dry recyclables (green bin)	Mixed organics (brown bin)	Total	Biodegradability factor
BMW Content	61.6%[114]	72.9%	93.6%	65%	-
	Weight %	**Weight %**	**Weight %**	**Weight %**	**-**
Organic waste	24.0%	1.3%	28.5%	16.6%	1
Garden waste	6.5%	0.1%	50.8%	6.1%	1
Papers	12.5%	54.0%	9.8%	19.0%	1
Cardboards	3.6%	15.3%	0.5%	6.0%	1
Composites	1.0%	2.2%	0.1%	1.0%	0
Textiles	7.3%	1.1%	0.5%	5.6%	0.5
Nappies	8.4%	0.4%	0.8%	5.4%	0.5
Plastics	13.6%	15.5%	1.8%	12.4%	0
Glass	3.3%	2.3%	0.2%	8.5%	0
Metals	3.1%	4.0%	0.1%	3.7%	0
Wood	1.2%	0.3%	0.1%	1.9%	0.5
Hazardous waste	0.9%	0.5%	0.0%	0.9%	0
WEEE	0.3%	0.2%	0.0%	1.8%	0
Unclassified combustibles	1.4%	0.2%	0.7%	1.7%	0.5
Unclassified incombustibles	1.2%	0.2%	0.1%	1.6%	0
Fines smaller than 20mm	11.7%	2.4%	6.0%	7.8%	0.5
Total	**100%**	**100%**	**100%**	**100%**	-

(Source: EPA Municipal Waste Characterisation Report 2008 at www.epa.ie/downloads/pubs/waste/plans/name,11659,en.html)

[113] This represents an average or composite of the residual bin from either a 1-bin, 2-bin or 3-bin collection service.
[114] The residual bin from a 3-bin collection service has a BMW content of 47% (refer to EPA Waste Characterisation Report 2008).

Table H-2 Composition and biodegradability factors for commercial wastes

Waste streams	Mixed residual waste (black bin)	Mixed dry recyclables (green bin)	Total	Biodegradability factor
BMW content	75.00%	85.10% (est)	77.00%	-
	Weight %	**Weight %**	**Weight %**	**-**
Organic waste	42.20%	11.80%	27.40%	1
Garden waste	0.20%	0.00%	0.10%	1
Papers	25.50%	24.20%	24.80%	1
Cardboards	4.00%	48.60%	25.80%	1
Composites	3.40%	0.70%	2.10%	0
Textiles	4.90%	0.60%	2.80%	0.5
Nappies	0.00%	0.00%	0.00%	0.5
Plastics	10.80%	5.30%	8.10%	0
Glass	1.70%	6.80%	4.20%	0
Metals	2.10%	0.90%	1.50%	0
Wood	0.40%	0.00%	0.20%	0.5
Hazardous waste	3.00%	0.90%	1.90%	0
WEEE	0.20%	0.00%	0.10%	0
Unclassified combustibles	0.40%	0.10%	0.30%	0.5
Unclassified incombustibles	0.20%	0.00%	0.10%	0
Fines smaller than 20mm	1.00%	0.10%	0.60%	0.5
Total	**100%**	**100%**	**100%**	-

(Source: EPA Municipal Waste Characterisation Reports, http://www.epa.ie/whatwedo/resource/municipal/)

Table H-3 EPA approved factors to calculate the BMW content of municipal waste streams

Municipal waste stream	BMW factor
Untreated 1-bin household waste [Note 1]	0.65
2-bin residual household waste	0.63
3-bin residual household waste	0.47
Untreated 1-bin commercial waste [Note 1]	0.77
2-bin residual commercial waste	0.75
3-bin residual commercial waste	0.68
Untreated MSW skip waste [Note 1]	0.35
Bulky waste from sorting of MSW skips	0.50
Oversize residues from MSW skips	0.43
Fines residues from MSW skips	0.40
Oversize residues from MSW bin collections (“wet waste”)	0.41
Fines residues from MSW bin collections (“wet waste”)	0.95
Residues from source separated recyclable waste (“clean material recovery facility”)	0.47
Biostabilised residual waste	0
Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.) [Note 1]	0.65
Residual MSW from civic amenity facility	0.63
Ash residue from MSW incineration	0

Note 1: Only waste that has been subject to treatment can be accepted for disposal at a landfill facility.
(See *EPA Approved Factors to Calculate the BMW Content of Municipal Waste Streams*, Version 2.0, 10th June 2011 http://www.epa.ie/downloads/advice/waste/municipalwaste/name).

APPENDIX I – RECOVERY OF NON-HAZARDOUS WASTE STREAMS

Section X reports on the management of municipal waste, however in gathering data for the National Waste Report operators provide data on all wastes managed at their facilities, and as this includes an element of non-municipal wastes some information on recovery of certain key non-hazardous waste streams arising in Ireland are presented in the tables below.

Table I-1: Segregated non-hazardous waste streams recovered in Ireland and abroad in 2010

Waste material recovered	Irish segregated waste recovered in Ireland (t)	Irish segregated waste recovered abroad (t)
Ferrous metals	653	539,613
Paper and cardboard	4,919	520,623
Glass	5,473	111,559
Plastic	16,571	80,724
Mixed metals	0	10,487
Non-ferrous metals	3,710	44,980
Wood	207,024	1,370
Refuse derived fuel	45,948	48,226
WEEE	18,869	17,617
Other[115]	0	669

(Source: Recovery organisations survey, landfill survey)

[115] Composite packaging, mixed packaging.

Table I-2: Composted waste in 2010[116]

EWC chapter sub-heading	Description	Tonnes
02 01	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing	52,196
02 02	Wastes from the preparation and processing of meat, fish and other foods of animal origin	7,031
02 03	Wastes from fruit, vegetables, cereal etc. preparation and processing	1,502
02 05	Wastes from the dairy products industry	12,600
02 06	Wastes from the baking and confectionery industry	232
02 07	Wastes from the production of alcoholic and non-alcoholic beverages (except, coffee, tea and cocoa)	23,680
03 01	Wastes from wood processing and the production of panels and furniture	943
03 03	Wastes from pulp, paper and cardboard production and processing	1,896
04 02	Wastes from the textile industry	149
07 01	Wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals	852
07 05	Wastes from the MFSU of pharmaceuticals	3,582
07 06	Wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics	520
15 01	Packaging (including separately collected municipal packaging wastes)	11
17 08	Gypsum-based construction material	140
19 08	Wastes from waste water treatment plants not otherwise specified	56,853
19 09	Wastes from the preparation of water intended for human consumption or water for industrial use	322
19 12	Wastes from the mechanical treatment of waste	1,647
20 01	Municipal wastes (separately collected fractions) except 15 01	73,695
20 02	Garden and parks wastes (including cemetery waste)	30,238
20 03	Other municipal wastes	1,112
TOTAL		**269,200**

[116] EPA surveyed 28 composter/anaerobic digestion facilities for 2010 data. It was not a complete census of such facilities. Wastes arising in Ireland only.

An Ghníomhaireacht um Chaomhnú Comhshaoil

Is í an Gníomhaireacht um Chaomhnú Comhshaoil (EPA) comhlachta reachtúil a chosnaíonn an comhshaol do mhuintir na tíre go léir. Rialaímid agus déanaimid maoirsiú ar ghníomhaíochtaí a d'fhéadfadh truailliú a chruthú murach sin. Cinntímid go bhfuil eolas cruinn ann ar threochtaí comhshaoil ionas go nglactar aon chéim is gá. Is iad na príomh-nithe a bhfuilimid gníomhach leo ná comhshaol na hÉireann a chosaint agus cinntiú go bhfuil forbairt inbhuanaithe.

Is comhlacht poiblí neamhspleách í an Ghníomhaireacht um Chaomhnú Comhshaoil (EPA) a bunaíodh i mí Iúil 1993 faoin Acht fán nGníomhaireacht um Chaomhnú Comhshaoil 1992. Ó thaobh an Rialtais, is í an Roinn Comhshaoil, Pobal agus Rialtais Áitiúil.

ÁR bhFREAGRACHTAÍ

CEADÚNÚ

Bíonn ceadúnais á n-eisiúint againn i gcomhair na nithe seo a leanas chun a chinntiú nach mbíonn astuithe uathu ag cur sláinte an phobail ná an comhshaol i mbaol:

- áiseanna dramhaíola (m.sh., líonadh talún, loisceoirí, stáisiúin aistrithe dramhaíola);
- gníomhaíochtaí tionsclaíocha ar scála mór (m.sh., déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta);
- diantalmhaíocht;
- úsáid faoi shrian agus scaoileadh smachtaithe Orgánach Géinathraithe (GMO);
- mór-áiseanna stórais peitreail;
- scardadh dramhuisce.

FEIDHMIÚ COMHSHAOIL NÁISIÚNTA

- Stiúradh os cionn 2,000 iniúchadh agus cigireacht de áiseanna a fuair ceadúnas ón nGníomhaireacht gach bliain.
- Maoirsiú freagrachtaí cosanta comhshaoil údarás áitiúla thar sé earnáil - aer, fuaim, dramhaíl, dramhuisce agus caighdeán uisce.
- Obair le húdaráis áitiúla agus leis na Gardaí chun stop a chur le gníomhaíocht mhídhleathach dramhaíola trí comhordú a dhéanamh ar líonra forfheidhmithe náisiúnta, díriú isteach ar chiontóirí, stiúradh fiosrúcháin agus maoirsiú leigheas na bhfadhbanna.
- An dlí a chur orthu siúd a bhriseann dlí comhshaoil agus a dhéanann dochar don chomhshaol mar thoradh ar a ngníomhaíochtaí.

MONATÓIREACHT, ANAILÍS AGUS TUAIRISCIÚ AR AN GCOMHSHAOL

- Monatóireacht ar chaighdeán aeir agus caighdeáin aibhneacha, locha, uiscí taoide agus uiscí talaimh; leibhéil agus sruth aibhneacha a thomhas.
- Tuairisciú neamhspleách chun cabhrú le rialtais náisiúnta agus áitiúla cinntí a dhéanamh.

RIALÚ ASTUITHE GÁIS CEAPTHA TEASA NA HÉIREANN

- Cainníochtú astuithe gáis ceaptha teasa na hÉireann i gcomhthéacs ár dtiomantas Kyoto.
- Cur i bhfeidhm na Treorach um Thrádáil Astuithe, a bhfuil baint aige le hos cionn 100 cuideachta atá ina mór-ghineadóirí dé-ocsaíd charbóin in Éirinn.

TAIGHDE AGUS FORBAIRT COMHSHAOIL

- Taighde ar shaincheisteanna comhshaoil a chomhordú (cosúil le caighdéan aeir agus uisce, athrú aeráide, bithéagsúlacht, teicneolaíochtaí comhshaoil).

MEASÚNÚ STRAITÉISEACH COMHSHAOIL

- Ag déanamh measúnú ar thionchar phleananna agus chláracha ar chomhshaol na hÉireann (cosúil le pleananna bainistíochta dramhaíola agus forbartha).

PLEANÁIL, OIDEACHAS AGUS TREOIR CHOMHSHAOIL

- Treoir a thabhairt don phobal agus do thionscal ar cheisteanna comhshaoil éagsúla (m.sh., iarratais ar cheadúnais, seachaint dramhaíola agus rialacháin chomhshaoil).
- Eolas níos fearr ar an gcomhshaol a scaipeadh (trí cláracha teilifíse comhshaoil agus pacáistí acmhainne do bhunscoileanna agus do mheánscoileanna).

BAINISTÍOCHT DRAMHAÍOLA FHORGHNÍOMHACH

- Cur chun cinn seachaint agus laghdú dramhaíola trí chomhordú An Chláir Náisiúnta um Chosc Dramhaíola, lena n-áirítear cur i bhfeidhm na dTionscnamh Freagrachta Táirgeoirí.
- Cur i bhfeidhm Rialachán ar nós na treoracha maidir le Trealamh Leictreach agus Leictreonach Caite agus le Srianadh Substaintí Guaiseacha agus substaintí a dhéanann ídiú ar an gcrios ózóin.
- Plean Náisiúnta Bainistíochta um Dramhaíl Ghuaiseach a fhorbairt chun dramhaíl ghuaiseach a sheachaint agus a bhainistiú.

STRUCHTÚR NA GNÍOMHAIREACHTA

Bunaíodh an Ghníomhaireacht i 1993 chun comhshaol na hÉireann a chosaint. Tá an eagraíocht á bhainistiú ag Bord lánaimseartha, ar a bhfuil Príomhstiúrthóir agus ceithre Stiúrthóir.

Tá obair na Gníomhaireachta ar siúl trí ceithre Oifig:

- An Oifig Aeráide, Ceadúnaithe agus Úsáide Acmhainní
- An Oifig um Fhorfheidhmiúchán Comhshaoil
- An Oifig um Measúnacht Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáide

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag ball air agus tagann siad le chéile cúpla uair in aghaidh na bliana le plé a dhéanamh ar cheisteanna ar ábhar imní iad agus le comhairle a thabhairt don Bhord.

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