National Waste Report for 2011

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National Waste Report for 2011

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Ms Fiona McCoole
Manager, Waste Statistics Team

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 eg 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.

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/pubs/advice/waste/municipalwaste/

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/pubs/reports/waste/stats/epawastecataloguehazardouslist2002.pdf.html

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 (eg 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.

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.

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 (eg 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 (eg 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.

tpa – tonnes per annum.

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.

1 KEY CONCLUSIONS, STATISTICS AND TRENDS, PROGRESS ON EU WASTE TARGETS

This section of the National Waste Report provides information on key conclusions, key statistics and trends in the report, as well as information on Ireland's progress in meeting EU waste collection, recovery and diversion targets.

1.1 Key Conclusions

- Municipal solid waste generation in Ireland has decreased by 17% since it peaked in 2007, although the rate of decrease is slowing down. A decrease in personal consumption over this period, which is linked to the economic recession, and its impact on household waste generation appears to be a key contributor to the declining trend and occurred despite an increase in population.
- The percentage of municipal solid waste recovered is showing steady annual increases, and the recycling rate for municipal waste is now equivalent to the EU27 norm (40%).
- The increased production of combustible waste from municipal waste streams for use as a fuel is contributing to increased recovery rates, as is the introduction of the first municipal waste incinerator to the country's infrastructure in late 2011. Increases in the landfill levy in 2011 and 2012 are also assisting in diverting waste from disposal to recovery options.
- The bulk of municipal waste recovered is exported for recovery. Municipal waste streams primarily exported for recovery are paper & cardboard, glass and metals for which there is limited recovery infrastructure currently in the State. Municipal waste streams recovered within the State are primarily organic wastes and wood waste, but it is expected that the use of residual/treated residual municipal waste as a fuel will become more significant in future years.
- The number of landfills accepting municipal waste for disposal is continuing to decrease, as is the remaining licensed landfill disposal capacity. As a consequence of landfill distribution and closure, significant inter-regional movement of waste is occurring.
- With the exception of targets under the End of Life Vehicle Directive, the Republic of Ireland is achieving its current EU obligations across a broad range of waste legislation (packaging, waste electrical & electronic equipment, batteries). Some future targets remain at risk (end of life vehicles, batteries, biodegradable municipal waste from landfill).
- Ireland cannot rely on a recession to reduce generation of municipal solid waste. In the case of the target for the diversion of biodegradable municipal waste from landfill, the decrease contributed to Ireland meeting the 2010 target, but if waste generation increases with economic growth future targets will be at risk. Efforts in waste prevention, diversion to recovery, the development of necessary supporting infrastructure and the enforcement of the 2009 and 2013 food waste regulations will be key to meeting future targets.

- The private sector dominates the municipal waste collection market, although Galway City Council, Waterford County Council and Kilkenny Borough Council remain in the waste collection market.
- Local authorities are involved in the provision and operation of essential public waste recovery infrastructure such as civic amenity and bring banks, which accounted for 16% of managed household waste in 2011, emphasising the importance of this infrastructure and the need to support it. With the private sector dominating the waste collection market it may make it difficult for local authorities to fund investment of waste infrastructure going forward.
- The lack of a national register of authorised waste facilities and their treatment capacities is an ongoing data gap for the State. While there are national data registers for EPA licensed activities and for waste collection permits, there is fractured information on waste facility permits and on Certificate of Registration sites. There is a legal obligation under the Waste Statistics Regulation to provide data biennially on the number and capacity of waste recovery and waste incineration operations in the State, so the collation of this data is necessary.
- The tonnage of construction and demolition waste collected has decreased by 83% since it peaked at 17.8 Mt in 2007. This reflects the considerable effect of the economic downturn on the construction & demolition sector.
- The overall quantity of hazardous waste managed in 2011 was broadly similar to the quantity managed in 2010. Nearly half of hazardous waste is exported for treatment (47%), while 22% is treated at the site of generation (IPPC licensed facilities) and 31% is sent to commercial hazardous waste treatment facilities within the State.
- 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.

1.2 Key statistics and trends

Waste stream	Key statistics and trends compared to 2010
Municipal Waste	It is estimated that 2,823,242 t of municipal waste was generated in 2011, continuing the downward trend since a peak in 2007.
	Ireland's municipal waste recovery rate increased by 5% to yield an overall recovery rate of 47%.
	Ireland's municipal waste recycling rate (excluding energy recovery) is 40%, the same as the EU27.
	Most municipal paper & cardboard, glass and metals are exported for recovery abroad as there is limited recovery infrastructure within the State.
	Most municipal organic waste (food and green waste) and wood waste is recovered within the State (composted, used as a fuel).

Household Waste	The tonnage of household waste managed (1,406,576 t) compared to 2010.
	The proportion of managed household waste recovered increased from 42% in 2010 to 47% in 2011. The proportion of managed household waste disposed to landfill decreased by 11% to 750,066 t.
	An estimated 30% of occupied houses did not avail of, or were not offered, a kerbside collection service (ranging from 2% to 63% across local authority areas), although it is acknowledged that this is probably an overestimation due to incomplete information on apartment waste and on household waste management practices such as bin-sharing.
	The private sector collected 78% of household kerbside waste (up from 65% in 2010), reflecting the fact that many local authorities have moved out of the household waste collection market.
	Ninety-three private sector operators and 13 local authorities reported collecting household waste at kerbside in 2011. The number of collectors operating in each local authority functional area ranged from 2 to 14, with an average of 8 operators in the market in each functional area, although the geographic spread of the service provided is not known.
	An estimated 61% of households on a kerbside collection service were on a 2-bin service (residual and mixed dry recyclable bin) in 2011, while 37% were a 3-bin service (residual, mixed dry recyclable and organic bin) (up from 34% in 2010). A fourth bin for the segregated collection of glass was offered in 18 of the 34 local authority functional areas by some operators (4,367 t collected).
	The separate kerbside collection of household organic waste (in 3-bin service) increased by 21% from 63,837 t in 2010 to 77,494 t in 2011.
	Householders in three of the thirty-four local authority functional areas (Cork City, Leitrim and Donegal) had no waste collection permit operators offering an organics kerbside collection service (although this is an improvement from six areas without the service in 2010).
Commercial Waste	The quantity of commercial waste managed dropped by 2% on 2010 figures.
	Commercial waste recovery increased from 45% in 2010 to 49% in 2011.
	Commercial waste disposed to landfill was 568,770 t, a decrease of 10% from 2010.
Biodegradable Municipal Waste	The quantity of biodegradable municipal waste disposed at landfill was 771,551 t, a 10% decrease compared to 2010. This is 161,551 t in excess of the second EU Landfill Directive target (due July 2013). Preliminary 2012 data indicates that Ireland is on track to meet the 2013 target, but the 2016 target remains at risk, even more so should economic recovery lead to increases in municipal waste generation.
	A considerable tonnage of managed household and commercial organic waste is available but not separately collected for treatment (estimated at 62% of household organic waste and 75% of commercial organic waste).
	Implementation and enforcement of the 2009 and 2013 Food Waste Regulations, which place obligations on waste collectors to provide a food waste collection service and obligations on the commercial sector and householders to segregate food waste and make it available for separate collection, will be key to ensuring Ireland meets future Landfill Directive targets.

Waste Packaging	Ireland has surpassed the 2011 EU packaging recovery target of 60%, with a 79% recovery rate reported for 2011.
Waste Electrical and Electronic Equipment	A total of 41,092 t of waste electrical and electronic equipment (WEEE) was collected for recovery (down from 45,012 t in 2010) in 2011.
	Household WEEE collected amounted to 7.6 kg per person, which exceeds the 4 kg per person EU target.
	The recovery rates for all categories of WEEE have been achieved.
End of Life Vehicles	Ireland is failing to meet the end of life vehicle (ELV) Directive targets which have been effective since January 2006. Preliminary data for 2011 indicate that a reuse/recovery rate of 79% and a reuse/recycling rate of 77% were achieved against targets of 85% and 80% respectively.
Waste Tyres	A total of 19,092 t of waste tyres were managed in 2011. Of this, 54% were exported for treatment. Of the tonnage treated within the State, 41% were chipped.
Waste Batteries	Ireland exceeded the 2011 Batteries Directive portable battery collection target as 29% portable batteries were collected relative to tonnage placed on the market (25% was the target). We are at risk however of failing to meet the 2016 collection target which is 45%.
Construction & Demolition Waste	Construction & demolition waste collected has decreased by 83% since a peak of 17.8 Mt in 2007. This reflects the considerable effect of the economic downturn on the construction & demolition sector.
	There was a 3% decrease in the reported quantity of C&D waste managed by recovery and disposal facilities (2.5 Mt), compared with 2010 data.
	Contaminated soil exported for treatment increased from 2,590 t in 2010 to 10,203 t in 2011, although the overall tonnage managed is still significantly down on pre-2009 data which most likely reflects the lack of land development and redevelopment projects since the economic downturn.
Hazardous Waste	Hazardous waste arising in 2011 originated primarily from the pharmaceutical and chemical industries.
	The overall quantity of hazardous waste managed in 2011 is broadly similar to the quantity managed in 2010. Of the total managed, 22% is treated on-site at industry, 31% is sent off-site to a commercial hazardous waste facility for treatment, and 47% is exported for treatment.
	There was a 12% decrease in the quantity of hazardous waste treated on-site at EPA-licensed Integrated Pollution and Prevention Control facilities, compared to 2010 data; this is expected to be due to reduced production at the facilities concerned.
	There was a 6% increase in the quantity of hazardous waste treated at EPA-licensed commercial hazardous waste treatment facilities, compared to 2010 data, which is largely attributable to an increase in the treatment of waste oils and solvents.
	There was a 4% increase in the quantity of hazardous waste exported for treatment in 2011 compared to 2010, mainly due to increases in the tonnage of solvents, thermal treatment and combustion residues and WEEE exported.

Municipal Waste Infrastructure	Twenty-one landfills accepted municipal waste for disposal in 2011.
	At the end of 2011 the remaining licensed national landfill capacity for municipal waste was approx. 14.5 Mt (circa 11 years remaining life expectancy). As a consequence of landfill distribution and closure, significant inter-regional movement of waste is occurring.
	Local authorities reported 113 civic amenity sites and 1,891 bring banks in operation in 2011, compared to 107 and 1,922 respectively in 2010.
	Household waste brought to bring banks and civic amenity sites accounted for 16% 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.
	The quantity of non-hazardous waste used as a fuel increased by 42% in 2011 compared to 2010.
	The tonnage of refuse derived fuel (RDF) used as a fuel at cement kilns and incinerators at home and abroad increased by 68% in 2011 compared to 2010, which contributed to increased municipal recovery rates.
	Twenty-six compost and anaerobic digestion facilities accepted municipal organic wastes[2] for recovery (compared to 24 in 2010); 11 accepted food waste for recovery (same as 2010).

1.3 Progress towards meeting EU recycling, recovery and diversion targets

Progress made towards meeting EU recycling, recovery and diversion targets arising from EU Directives waste strategies is presented in Table 1. These targets are also the performance indicators against which Ireland's waste management performance will be measured under the DECLG's most recent waste management policy, *'A Resource Opportunity'*, published in July 2012.

With the exception of end of life vehicle targets, Ireland is well advanced towards achievement of all of its EU obligations across a broad range of waste legislation. The End of Life Vehicle (ELV) Directive 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 the DECLG will be engaging with producers and other stakeholders in this regard. The increases in the landfill levy, and the removal of the exemption of the landfill levy for shredder residue is likely to encourage the recovery of shredder residue and therefore increase ELV recovery rates over time.

Ireland recorded a drop in biodegradable municipal waste (BMW) consigned to landfill in 2011 (as a proportion of reduced tonnage of municipal waste landfilled), and so again met its first phase target for the diversion of BMW from landfill. There are stricter BMW diversion targets in force for 2013 and 2016. Preliminary 2012 data indicates that Ireland is on track to meet the 2013 target, but the 2016 target remains at risk, even more so should economic recovery lead to increases in municipal

[2] Paper & cardboard, food waste, edible oils & fats, green waste.

waste generation. The recent publication of the EU (Household Food Waste and Bio-Waste) Regulations 2013 (S.I. No. 71 of 2013) are welcome, as the obligations imposed on waste collectors to provide or arrange for the separate collection of household food waste should contribute to increased diversion of household food waste from the residual bin from disposal to recycling (eg composting) or energy recovery (eg anaerobic digestion). The enforcement of the Waste Management (Food Waste) Regulations 2009, which place obligations on producers of food waste in the commercial sector, is also vital.

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

Directive	Title	Article	Targets		Current progress to target in Ireland (2011)	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.	79%	Achieved
				55% as a minimum by weight of packaging waste will be recycled.	71%	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;	81%	Achieved
				(ii) 60% by weight for paper and board;	92%	Achieved
				(iii) 50% by weight for metals;	67%	Achieved
				(iv) 22.5% by weight for plastics, counting exclusively material that is recycled back into plastics;	48%	Achieved
				(v) 15% by weight for wood.	93%	Achieved
2002/96/EC[3]	**WEEE Directive**	5(5)	(31-12-2006) 31-12-2008[4]	Separate collection of > 4kg of WEEE from private households per person per year.	7.6 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% 82%	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.	88% 87%	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.	87% 87%	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.	88%	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.	79%[5]	Not achieved
				Reuse and recycling to a minimum of 80% by average weight of vehicle and year.	77%[5]	Not achieved
		7(2)(b)	1-1-2015	Reuse and recovery to a minimum of 95% by average weight of vehicle and year.	(79%)[5]	Risk Due January 2015
				Reuse and recycling to a minimum of 85% by average weight of vehicle and year.	(77%)[5]	Risk Due January 2015

[3] Amended targets for WEEE reuse, recovery and recycling are set down in the recast of the WEEE directive (Directive 2012/19/EU of 4 July 2012), which will enter into force in Ireland on 14 February 2014.
[4] Ireland secured a two-year derogation.
[5] Based on preliminary 2011 data analysis. Up-to-date recycling and recovery information on shredder residue arising from depolluted ELV shells exported in 2011 was not available at the time of publication.

Directive	Title	Article	Targets		Current progress to target in Ireland (2011)	Indicator
			Target date	Specifics		
2006/66/EC	Batteries Directive	10(2)	31-12-11	Minimum 25% collection rate for batteries & accumulators.	29%[6]	Achieved
			26-9-2016	Minimum 45% collection rate for batteries & accumulators.	(29%)	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 2012	To be reported to Commission in June 2013
				(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		
				(c) recycling of 50 % by average weight of other waste batteries and accumulators.		
1999/31/EC	Landfill Directive	5(2)	(16-7-2006) 16-7-2010[7]	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)	771,551 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)	+ 161,551 t (estimate)[8]	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)	+ 344,551 t (estimate)[8]	- 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).*	45%[9]	On track Due December 2020
		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)	97%[10]	Achieved
		29	12-12-2013	Establishment of a National Waste Prevention Programme (NWPP)	NWPP established in 2004	Achieved

[6] Based on information provided by the battery compliance schemes (WEEE Ireland and ERP Ireland) and verified by DECLG.
[7] Ireland secured a four-year derogation on first and second targets.
[8] Based on 2011 BMW to landfill, and assuming no increase in BMW to landfill (standstill).
[9] Calculation method changed since 2010 to be based on household waste generated, rather than household waste managed.
[10] Based on C&D managed data in 2011.

2 INTRODUCTION

The EPA's National Waste Prevention Programme (NWPP) produces national statistics on waste generation and management in the Republic of Ireland.[11] 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. This report includes data on municipal waste, hazardous waste, construction & demolition waste and also particular waste streams subject to Producer Responsibility Initiatives (eg packaging, end of life vehicles) for calendar year 2011. This year the report includes a new chapter on waste tyres.

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 Structural and Regional Indicators (eg the Sustainable Development Indicator on Municipal Waste and the Regional Environmental Questionnaire).

2.1 National Waste Report survey approach

This NWR presents waste data for the calendar year 2011. Waste data was sought from the following sources to collate the information presented:

- Local authorities, including the National Transfrontier Shipment Office at Dublin City Council;
- EPA licensed waste operators;
- Local authority permitted waste operators;
- EPA licensed Integrated Pollution and Prevention Control activities;
- Compliance schemes and self-complying producers (for Producer Responsibility Initiatives).

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 their data. An estimated 7,000 data sets are mined (by EPA and data suppliers) to generate the information distilled into this report.

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. Data reconciliation visits were completed with the WEEE and packaging compliance schemes. The EPA provided training workshops on completion

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

of the surveys, updated its online guidance manuals,[12] and provided a helpline and dedicated e-mail address for waste operators.

The collection of waste generation and management data for the State is a significant resource burden on the waste industry, local authorities, the EPA and others, but is necessary in order to inform policy as well as to provide timely and accurate data for legislative EU reporting requirements.

The EPA recognises that the multiplicity of waste reporting requirements, particularly in the first quarter of each calendar year, is a burden on waste operators. The EPA uses existing data sources where possible (such as waste collection and waste facility permit annual returns, Pollutant Release and Transfer Returns (PRTR)). However, as data on source of waste are key to reporting on municipal waste and because the complexity of EU reporting obligations requires specific data that may not be available from these annual returns, the EPA needs more detailed information from particular operators and especially those that are 'end-handlers' i.e., operators who undertake the final treatment (disposal or recovery) at their facility, or who are the point of export of the waste.

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. Totals appearing in this report may vary by +/- 1 tonne due to statistical rounding.

2.2 National developments and issues

This section reports on key developments in national and EU policy and legislation since publication of National Waste Report 2010 in February 2012.

2.2.1 National Waste Collection Permit Office (NWCPO)

Since 1st February 2012, the National Waste Collection Permit Office (NWPCO) at Offaly County Council[13] has been responsible for issuing all waste collection permits in the State. Prior to this, there were ten nominated authorities in the State that had responsibility for issuing waste collection permits. The EPA is co-operating with NWCPO with regard the development of their e-reporting system to lead to efficiencies and improve the quality and availability of waste collection data.

2.2.2 Sustainable Development

In June 2012, the government published *'Our Sustainable Future, a Framework for Sustainable Development for Ireland."*[14] The framework sets out the challenges that Ireland faces across a number of policy areas, including sustainable consumption and production, at a time when people's main concern is economic recovery. The aim of the framework is to provide for the integration of sustainable

[12] See www.wastesurvey.ie.
[13] www.nwcpo.ie
[14] www.environ.ie/en/Publications/Environment/Miscellaneous/FileDownLoad,30452,en.pdf

development into key areas of policy, to put in place effective implementation mechanisms and deliver concrete measures. In the area of sustainable consumption and production, the measures set out are:

(i) Complete policy on waste management.

(ii) Ensure the effective implementation of resource efficiency initiatives in Ireland in line with the EU Roadmap to a Resource Efficient Europe under Europe 2020.

(iii) Fully implement the Action Plan on Green Public Procurement, supporting the development of the green economy in Ireland.

(iv) Relevant agencies (eg IDA, SEAI and EPA) should continue to offer an integrated suite of resource efficiency programmes for business.

2.2.3 National Waste Management Policy

In July 2012 the DECLG published the government's new waste management policy '*A Resource Opportunity – Waste Management Policy in Ireland*'. The policy sets out a series of measures which aim to move Ireland away from dependence on landfill for the treatment of municipal waste, and through which waste will be reduced and the resources recovered from waste maximised.

The policy sets out measures and actions for all tiers of the waste hierarchy, namely prevention, preparation for reuse, recycling, recovery and disposal. There are also policy measures and actions for the regulation of household waste collection and compliance and enforcement. There will be an annual review of performance under each policy heading, conducted by a National Compliance Committee. Performance indicators will be the Producer Responsibility Initiative targets, mirroring Table 1 (Chapter 1) of this document.

Also in July 2012 the DECLG published the Regulatory Impact Analysis on Household Waste Collection.[15] The analysis recommended that the Government preserves the current household waste collection market structure and strengthens the regulatory regime which applies, which would include mandated service levels including the provision of segregated waste collections. The policy of retaining the current market structure will be reviewed in 2016.

In October 2012 the DECLG published '*Putting People First – Action Programme for Effective Local Government'.*[16] One of the actions under this programme is that the number of waste planning regions will reduce from the existing ten to no more than three, taking account of the proposed new regional assembly structure, i.e. an Eastern and Midlands Region, a Southern Region and a Connaught-Ulster Region.[17]

[15] www.environ.ie/en/Environment/RHLegislation/FileDownLoad,30784,en.pdf
[16] www.environ.ie/en/PublicationsDocuments/FileDownLoad,31309,en.pdf
[17] Note that where waste management planning regions are included in the tables and figures of this report, the proposed new structure is used.

2.2.4 European Union (Household Food Waste and Bio-Waste) Regulations 2013

In March 2013, the European Union (Household Food Waste and Bio-Waste) Regulations 2013 (S.I. No. 71 of 2013) were published. These regulations are designed to promote the segregation and recovery of household food waste and will complement the Waste Management (Food Waste) Regulations (S.I. No. 508 of 2009) which require the segregation and recovery of food waste arising from commercial premises. S.I. No. 71 of 2013 places obligations on waste collectors to have a separate collection service for household food waste and places obligations on householders who produce food waste to segregate it and make it available for separate collection. If successfully implemented and enforced, these regulations will contribute to the achievement of future targets under the Landfill Directive for the diversion of biodegradable municipal waste from disposal to landfill. It will also increase Ireland's household recycling rate as the food waste stream will be diverted to composting and anaerobic digestion activities rather than being disposed to landfill.

2.2.5 EWC classification of mixed municipal waste exiting waste management facilities

A number of waste operators are baling municipal waste and exporting it for energy recovery. The NTFSO at Dublin City Council has been engaging with the EPA on the appropriate European Waste Catalogue (EWC) classification of material exiting EPA licensed activities, and in October 2012, the EPA published a position paper on this topic. The paper identifies what is the minimum treatment necessary to justify a reclassification of the waste code from EWC code 20 03 01 (mixed municipal waste) to EWC code 19 12 (waste arising from mechanical treatment of waste (for example sorting, crushing, compacting, pelletising not otherwise specified). The paper can be downloaded at http://www.epa.ie/pubs/advice/waste/municipalwaste/epaviewpointonewcclassificationofmixedmunicipalwaste.html.

2.2.6 National Implementation Plan for POPs

The Stockholm Convention on Persistent Organic Pollutants (POPs) is a global treaty that aims to protect human health and the environment from POPs. The Convention includes several requirements in the control of POPs including banning or restricting the production, use, import and export of POPs and measures to reduce or eliminate their releases (including releases from stockpiles and wastes containing POPs). The Convention entered into force for Ireland in 2010 and in accordance with Article 7 of the Convention, Ireland is required to develop a National Implementation Plan on POPs for the implementation of its obligations under the Convention. The EPA, as competent authority, has prepared the National Implementation Plan[18] in consultation with a number of public authorities, national stakeholders and the public. The Plan was transmitted to the Stockholm Convention Secretariat in November 2012.

[18] www.epa.ie/pubs/reports/waste/haz/nationalimplementationplanonpops.html

The National Implementation Plan on POPs includes an assessment of POPs in Ireland and details the measures put in place to protect human health and the environment from the POPs that are listed under the Convention. The Plan also outlines further activities which will be carried out to support the control of POPs. Implementation of measures outlined in the plan, which has commenced, involves proactive engagement of a number of key stakeholders, particularly those waste contractors handling material identified in the National Implementation Plan as containing/potentially containing, POPs.

2.3 EU developments and obligations

2.3.1 Waste Statistics Regulation

The Waste Statistics Regulation (EC 2150/2002 as amended) establishes a framework for the production of EU statistics on the generation, recovery and disposal of waste. In addition to providing a source of comparable and harmonised data on waste for all EU Member States, the Regulation also enables tracking of Member States' adherence to, and progress against, the fundamental principles underpinning EU waste policy.

The Regulation requires each Member State to report biennially on waste generation, waste treatment in the State, and the number and capacity of certain recovery and disposal operations in the State to Eurostat (the Statistical Office of the European Communities). The EPA, in co-operation with the Central Statistics Office, collates, verifies, analyses, and submits the datasets to Eurostat. The 2010 datasets were submitted to Eurostat in July 2012. Eurostat has published Waste Statistics Regulation data for calendar years 2004, 2006, 2008 and 2010 to their website.[19]

2.3.2 WEEE Directive Recast

The Waste Electrical and Electronic Equipment Directive, originally published in 2003, was recast in 2012 (Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment). The main implications of the recast WEEE Directive relate to the collection targets to be achieved by all Member States and the open scope of products covered by the Directive.

Electrical and electrical equipment is currently classified according to ten categories. This classification will remain in place until 14 August 2018, after which all electrical and electronic products will be included in the scope of the Directive (referred to as open scope), and will be classified according to six categories. On the basis of average weight of EEE placed on the market in the three preceding years, the collection targets are 45% in 2016 and 65% in 2019. Alternatively, 85% of WEEE generated in the Member State can be collected in 2019. The Irish WEEE collection target for 2015 will depend on the amount of household WEEE collected during 2012 to 2014. The WEEE recast must be transposed into national legislation by 14 February 2014.

[19] epp.eurostat.ec.europa.eu/portal/page/portal/waste/data/database

2.3.3 End of Waste Criteria

An End of Waste Regulation (EU No 1179/2012)[20] for glass cullet was published in the Official Journal of the European Union in December 2012, and will apply in Member States from 11 June 2013. The Regulation establishes criteria determining when glass cullet ceases to be waste. The criteria place limits on the amount of contaminants such as metals, organics and stones which can be contained in the glass cullet, amongst other obligations. The End of Waste Regulation for scrap iron, steel and aluminium has been in force since October 2011. Member States failed to reach agreement on proposed EoW rules for copper and paper in July 2012 although EoW proposals for copper scrap have been submitted to the Council of Ministers. Other waste streams being considered for EoW legislation are plastics and biodegradable waste.

[20] eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:337:0031:0036:EN:PDF.

3 GENERATION OF MUNICIPAL WASTE

3.1 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 2011, it is estimated that a total of 2,823,242 t of municipal waste was generated in Ireland (Table 2 and Figure 1), continuing the downward trend in municipal waste generation since it peaked in 2007.

The data for household waste generation includes estimates for uncollected household waste (276,665 t; refer to Section 3.3.4). Municipal waste *managed* encompasses municipal waste that is collected, brought directly to waste facilities and home composted; whereas municipal waste *generated* also includes the uncollected household waste estimate. 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, 2006–2011

	2006	2007	2008	2009	2010	2011
Household waste (t)	1,978,716	1,761,167	1,677,338	1,626,469	1,686,387	1,683,241
Commercial waste (t)	1,327,068	1,549,075	1,477,397	1,299,807	1,141,015	1,114,829
Cleansing waste (t)	(78,822)	(87,441)	(69,546)	26,701	18,713	25,172
Total municipal waste (t)	**3,384,606**	**3,397,683**	**3,224,281**	**2,952,977**	**2,846,115**	**2,823,242**
% change on previous year's tonnage	11.3	0.4	-5.1	-8.4	-3.6%	-0.8%

(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 25,172 t of street sweepings and parks maintenance waste disposed of at landfill in 2011, though more was likely collected and co-mingled with household and commercial streams for landfill.

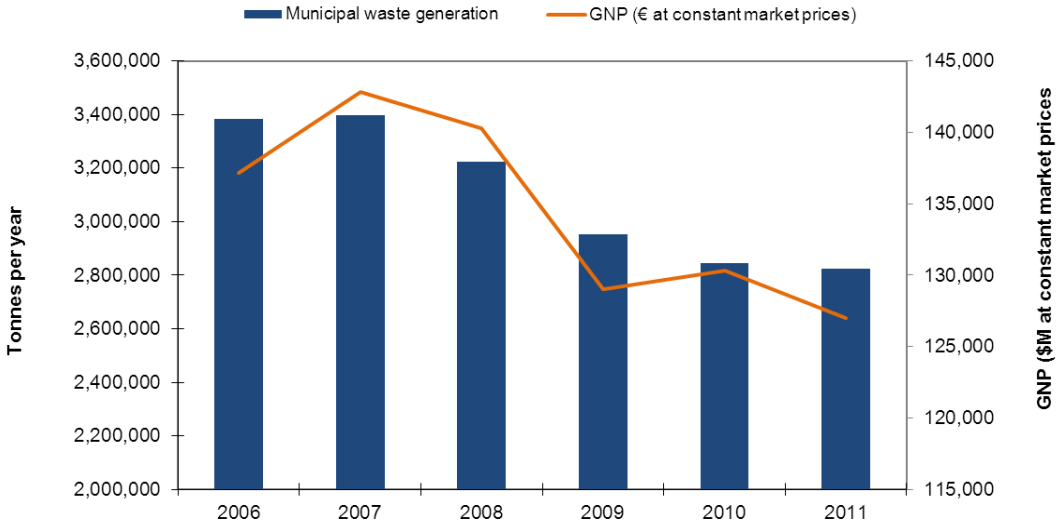


Figure 1: Trends in municipal waste generation and GNP, 2006-2011[21]

Figure 2 shows that there was a substantial drop in municipal waste generation between 2007 and 2011, although the rate of decrease is not as sharp since 2009. This decrease, while reflecting a decrease in personal consumption, has taken place despite increasing population over the same time period.

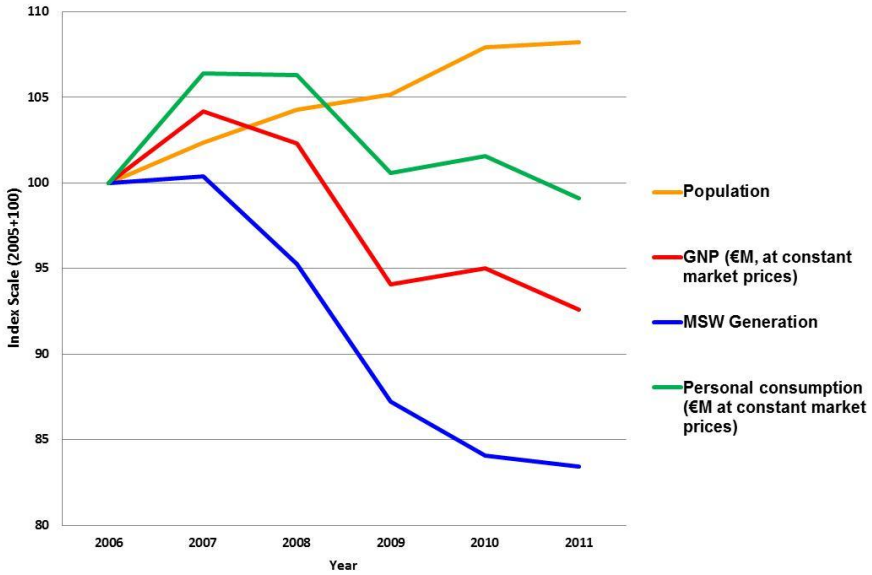


Figure 2: Trends in municipal waste generation, GNP, population and consumption, 2006-2011[22]

[21] CSO data on GNP.

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

3.2 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)[23] that forecasts national environmental emissions and resource use up to 2030, 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 2030 depending on the economic recovery possibilities.

Using this model, it is anticipated that the total tonnage of municipal waste generated will increase by approx. 830,000 t within the next 15 years (Figure 3), although generation in the period 2011 to 2016 is anticipated to be more or less static.

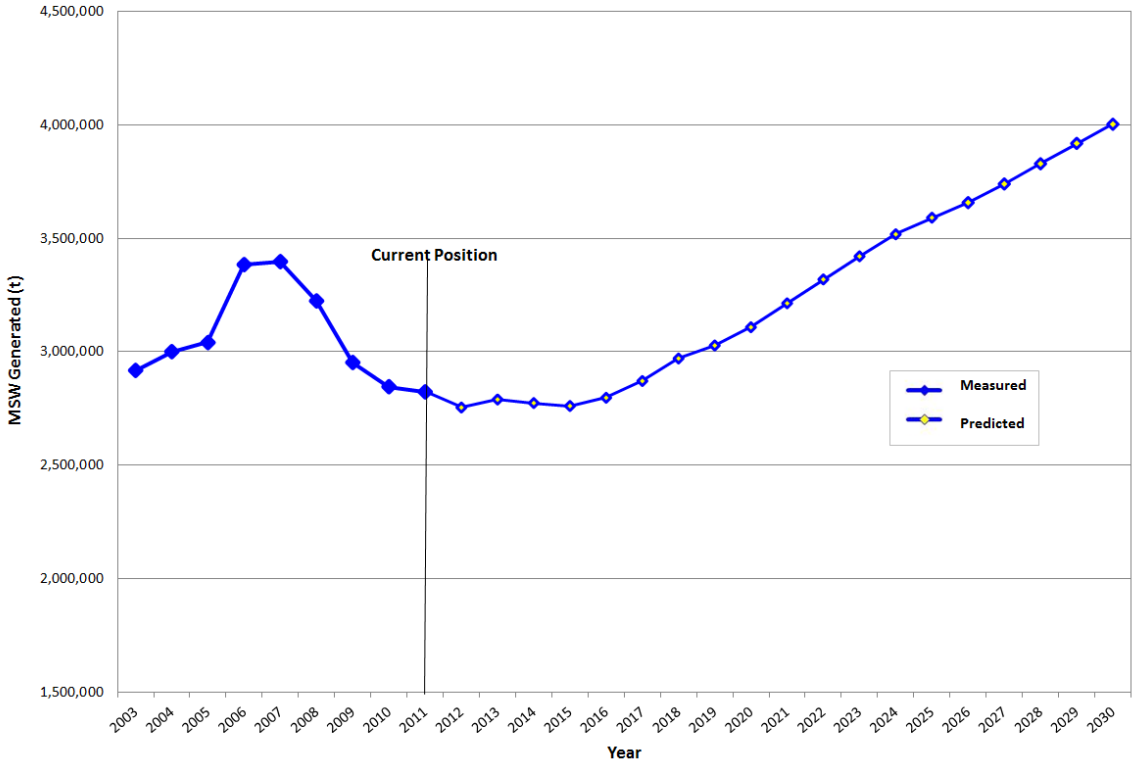


Figure 3: Predicted growth in municipal waste generation (ISus model)

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 addition, waste prevention, resource efficiency and eco-design programmes must become embedded, in order to ensure the decoupling of waste generation in Ireland from any future economic growth.

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

4 MANAGEMENT OF MUNICIPAL WASTE

4.1 Quantities and trends

The quantity of municipal waste *managed* in 2011 (2,546,577t) indicates a 1% reduction on that managed in 2010 (2,580,435 t). Disposal and recovery rates for the managed municipal waste streams are shown in Table 3 and Figure 4. The quantity of municipal waste recovered in 2011 increased by 5% on that reported in 2010 (from 42% to 47%, as a proportion of waste generated), while the landfill of municipal waste decreased by a corresponding amount. The total managed municipal waste arisings comprised 1,406,576 t of household wastes, 1,114,829 t of commercial wastes and 25,172 t of street cleansing wastes. The constituents of the commercial and household waste streams are examined in greater detail later in this section.

Figure 4 illustrates trends in the recovery and disposal of municipal waste, together with population growth between 2006 and 2011. The trends illustrated 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, 2011

Material	Quantity managed (t)[24]	Quantity disposed to landfill (t)	National landfill disposal rate (%)	Quantity recovered (t)	National recovery rate (%)
Total	**2,546,577**	**1,344,008**	**53**	**1,202,569**	**47**

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

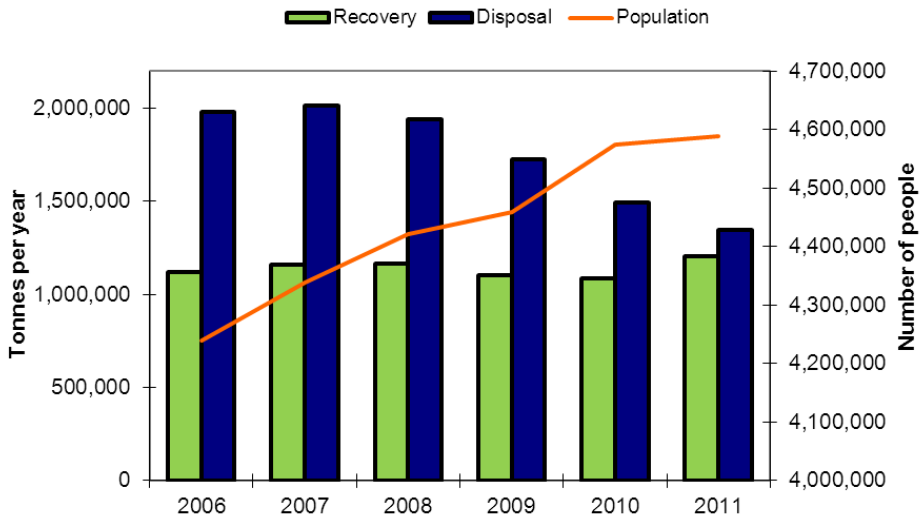


Figure 4: Trends in recovery and disposal of municipal waste, 2006–2011

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

Although Ireland is still very dependent on landfill for residual waste disposal (53%), the improved recycling rate (i.e. energy recovery excluded) (40%) is the same as the EU 27 average[25] (Figure 5).

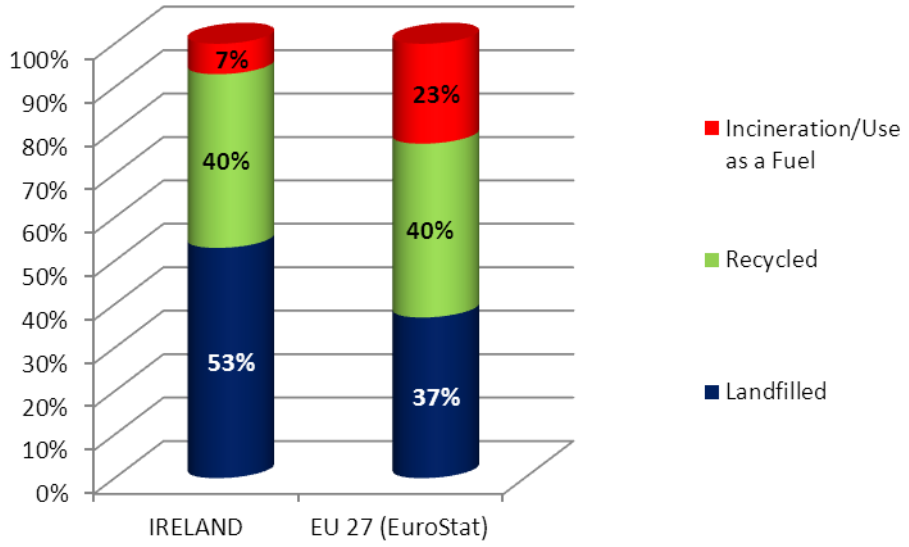


Figure 5: Management of Irish municipal waste for 2011 in comparison with EU 27 municipal waste

Table 4 presents the breakdown of the municipal disposal data for 2011 and calculates the market change since 2010, which is overall a decrease of 10% of municipal solid waste to landfill since 2010. Notably the household waste stream is down by 11% on 2010 figures, while the commercial waste stream disposed to landfill is down by 10% on 2010 figures.

Table 4: Change in landfill disposal of municipal waste components between 2010 and 2011

	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)
2010	843,842	633,010	18,713	1,495,565[26]
2011	750,066	568,770	25,172	1,344,008
% change	**-11%**	**-10%**	**35%**	**-10%**

[25] epp.eurostat.ec.europa.eu/ for 2011 report year.
[26] Not including 28,341 t of repatriated waste from historical illegal dumping in Northern Ireland, as this waste was not generated in 2010.

4.2 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.

Table 5 shows that in 2011, approx. 27% of non-hazardous municipal waste recovery took place in Ireland. Most municipal wood and organic waste was recovered in the State in 2011 (>97%), 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 2011, although approx. 55% was sent abroad for recovery. Indaver Carranstown commenced energy recovery of municipal waste towards the end of 2011, which led to an increase in energy recovery within the State.

Table 5: Non-hazardous municipal waste recovered in Ireland, 2010 and 2011 (not including imports)

Material[27]	2010		2011	
	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	43,819[28]	99.8	29,765	100
Organic waste[29]	135,237	94.9	167,440	97.4
Refuse derived fuel[30]	45,948	48.8	71,387	45.1
Plastic	13,853	19.1	17,146	26.2
Glass	5,112	4.6	6,490	5.3
Paper and cardboard	4,919	0.9	2,197	0.4
Municipal residual/treated residual waste	0	0	37,063	100
Non-ferrous metals	50	0.8	0	-
Total	**248,939**	**22.9**	**331,487**	**27.3**

(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 are not classed as municipal waste.
[29] Includes edible oils and fats.
[30] Used as a fuel.

Table 6: Non-hazardous municipal waste recovered abroad, 2010 and 2011 (not including imports)

Material[27]	2010		2011	
	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	79,879	100	81,952	100
Other[31]	564	100	311	100
Mixed metals	10,070	100	0	-
Non-ferrous metals	6,048	99.2	5,317	100
Paper and cardboard	520,623	99.1	540,085	99.6
Glass	106,483	95.4	115,268	94.7
Plastic	58,758	80.9	48,367	73.8
Refuse derived fuel[30]	48,226	51.2	86,911	54.9
Organic waste[33]	7,241	5.1	4,450	2.6
Wood	76	0.2	0	-
Total	**837,969**	**77.1**	**882,660**	**72.7**

(Source: Recovery organisations survey)

Some waste materials are also imported into the State for recovery (Table 7). In 2011, a total of 112,059 t of waste was reported as imported into Ireland by operators that we survey for the National Waste Report, comprising mainly plastic (57%), wood (15%) and non-ferrous metals (14%).

Table 7: Import of non-hazardous waste for recovery, 2010 and 2011

Material imported for recovery[32]	2010 (t)	2011 (t)
Plastic	61,952	63,619
Wood	8,012	16,948
Non-ferrous metals	18,552	16,223
Organic waste[33]	15,272	12,109
Ferrous metals	3,574	2,482
Tyres	859	611
C&D plasterboard	0	27
End of life vehicles	8	21
WEEE	0	18
Paper and cardboard	6	0
Total	**108,234**	**112,059**

(Source: Recovery organisations surveys)

[31] Composites, mixed packaging.
[32] This table includes some non-municipal, non-hazardous wastes imported for recovery (e.g. C&D, tyres). No hazardous waste imports included in this table. See Section 12.5 for information on hazardous waste imported for recovery.
[33] Includes edible oils and fats.

Table 8 shows the destination of municipal non-hazardous recyclates exported for recovery in 2011. The total exported was 882,660 t, a 5% increase on the tonnage exported in 2010. The principal municipal waste exported is paper & cardboard (accounting for 61%). Paper & cardboard, glass, metals, refuse derived fuel and plastic wastes account for 99% of municipal wastes exported for treatment. In terms of trends since 2010, paper & cardboard export increased by 4%, glass export by 8% and refuse derived fuel by a significant 80%.

Table 8: Destination of municipal non-hazardous recyclable waste streams exported in 2011

	Paper & cardboard (t)	Glass (t)	Metals (t)	Refuse derived fuel (t)	Plastic (t)	Edible oils & fats (t)	Other (t)[34]	Total (t)
UK	153,907	78,251	58,955		40,623	4,437	25	336,197
China	161,313				266			161,579
Europe (unspecified)	147,739	8,953			3,751		287	160,729
Netherlands	27,440	28,064	16,287		124			71,915
Latvia				44,119				44,119
India	25,177		500					25,677
Denmark				25,674				25,674
Spain/ Portugal			10,731	14,736	120			25,587
Sweden	13,867			2,382				16,249
Asia (unspecified)	3,942				1,295			5,237
South Korea	2,746				388			3,134
Norway	2,575							2,575
Germany			63		1,054	13		1,130
Belgium	326				478	1		804
United Arab Emirates			727					727
Switzerland	514							514
Italy	462							462
Pakistan					268			268
Saudi Arabia	76							76
Unknown			6					6
Total	**540,085**	**115,268**	**87,269**	**86,911**	**48,367**	**4,450**	**311**	**882,660**

(Source: Recovery organisations survey)

The United Kingdom continues to be the principal initial destination (although a percentage of what is exported to the UK is subsequently bulked and sent outside the UK for treatment). A total of 540,085 t

[34] Composite and mixed packaging

of paper and cardboard was exported in 2011 for recovery (an increase on 2010), 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, eg bulking).

4.3 Household waste

4.3.1 Quantities and trends

The reported quantity of household waste managed (1,406,576 t) decreased by 1% from that reported for 2010 (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 to collection days 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 estimated as the difference between the quantity collected/brought and disposed.

Of household waste managed in 2011, 79% was collected at kerbside, 18% was otherwise brought for treatment (bring banks, civic amenity sites, directly to landfill, to retailers/collection days in the case of WEEE) and 3% is the estimate of home composting.

The estimated quantity of household waste recovered increased to 656,510 t. The recovery rate (at 47%) represents a 6% increase on that achieved in 2010. The continuing improvement in household recovery rates and diversion of household waste from landfill is a very positive step and reflects the collection of source segregated recyclables at kerbside (including biowaste) and a consistent stream of dry recyclables from kerbside and bring centres (Figure 6). From current trends in Figure 6 it is expected that the household waste recovery rate will exceed the disposal rate by the 2013 data report year.

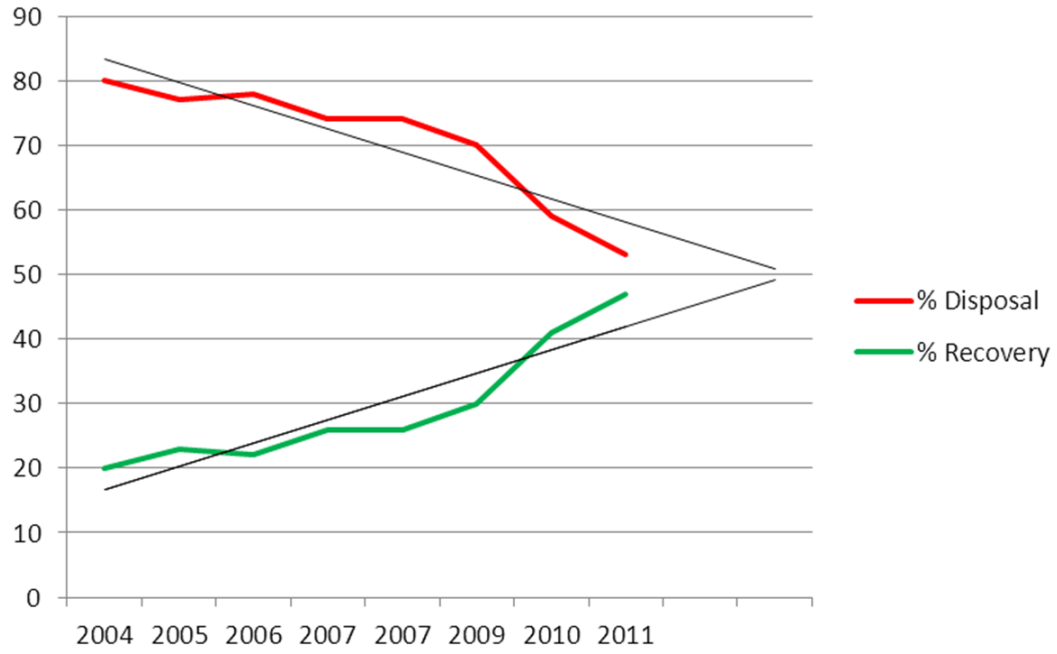


Figure 6: Trends in percentage household disposal and recovery, 2004 to 2011

The amount of refuse derived fuel sent for recovery in the State and abroad increased from 94,174 t in 2010 to 158,297 t in 2011 (68% increase). The Minister for the Environment, Community & Local Government raised the landfill levy to €65 per tonne of waste disposed at authorised and unauthorised landfill facilities, effective since 1 July 2012. This is an increase of €15 per tonne since 2011. The landfill levy is due to increase again by €10 per tonne in July 2013. Such increases are contributing to the diversion of waste from disposal to recovery options.

Table 9: Trends in household waste management, 2006 to 2011

	2006	2007	2008	2009	2010	2011
Quantity disposed to landfill (t)	1,379,246	1,200,980	1,155,567	1,056,267	843,842	750,066
Quantity recovered (t)	393,995	424,510	401,312	442,202	576,864	656,510
Recovery rate (%)	22	26	26	30	41	47
Total (t)	**1,773,242**	**1,625,490**	**1,556,879**	**1,498,469**	**1,420,706**	**1,406,576**

Figure 7 illustrates that the quantity of household waste managed decreased quite significantly between 2006 and 2010, although with a tapering off of the reduction in 2011. This decrease reflects the decrease in personal consumption but runs contrary to population growth trends.

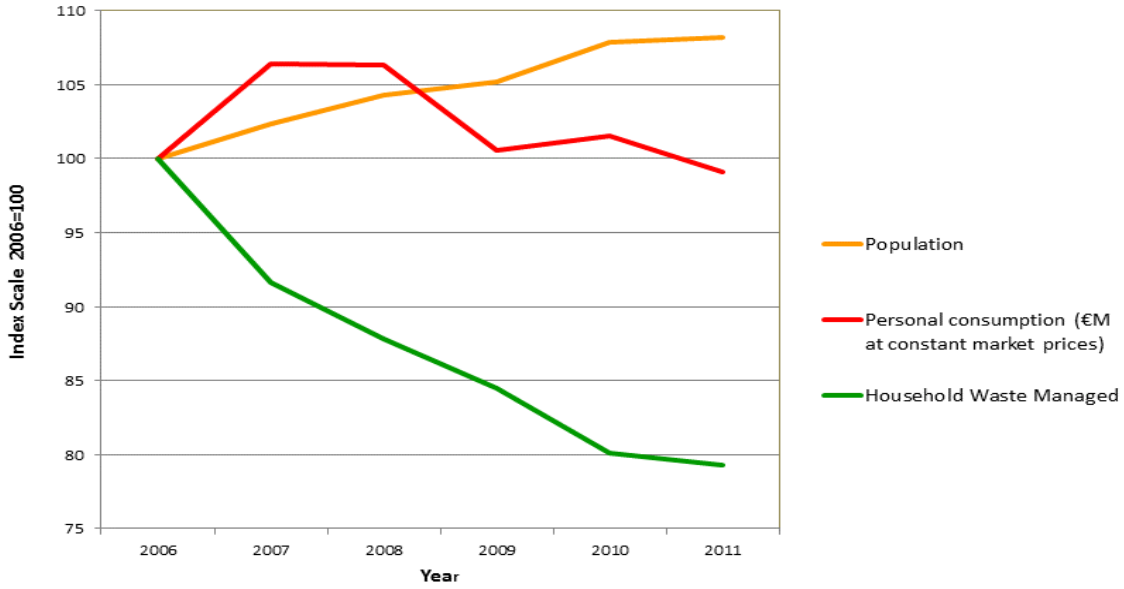


Figure 7: Household waste managed with population and personal consumption indices[35], 2006-2011

Average household waste generation per capita in RoI was 367 kg in 2011, which is 16% lower than the average in the EU 27. See Figure 8 below.

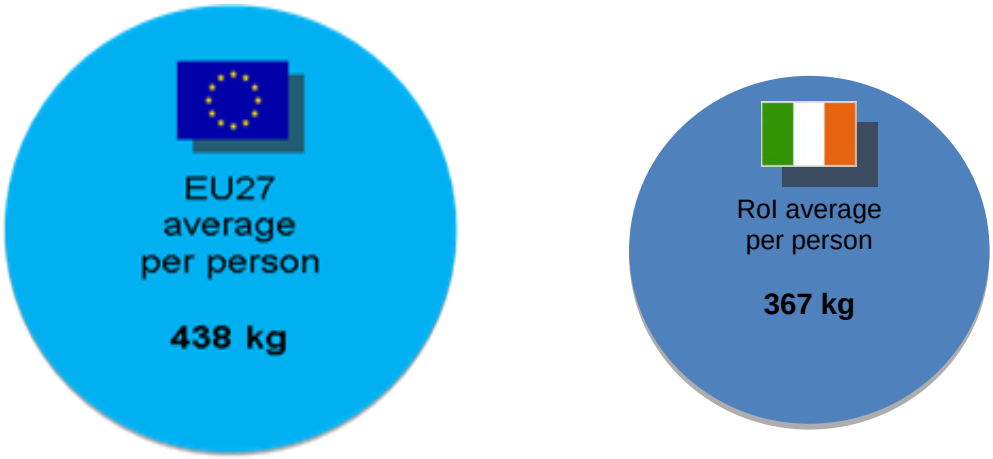


Figure 8: Household waste generation per capita in EU 27 and Republic of Ireland[36]

[35] CSO data on population and personal consumption.
[36] EU 27– Eurostat, 2010 data; RoI, 2011 data.

4.3.2 Household waste collection

The household waste collection market has gone through a period of rapid transition, with many local authorities exiting the market. In 2008, 15 local authorities were collecting household waste at kerbside, in 2011 there were six (Kerry, Wexford, Dublin City, Dun Laoghaire Rathdown, Waterford County and Galway City) and at the time of publication three local authorities are collecting household waste (Galway City Council, Kilkenny Borough Council and Waterford County Council).

In 2011, 93[37] private sector waste collection permit holders and 13 local authorities reported collecting household waste at kerbside. The number of operators with a market presence in the various local authority areas varied widely, from a minimum of 2 (Carlow Co Co) to a maximum of 14 (Offaly and South Dublin Co Cos). The average number of household kerbside waste collectors per local authority functional area was 8 in 2011, although some operators only serviced a small number of households.

Of the 1,116,556 t of household waste collected at kerbside in 2011, 69% of the tonnage was presented as mixed residual waste, 24% as mixed dry recyclables (including segregated glass where collected) and 7% organics, see Figure 9 below.

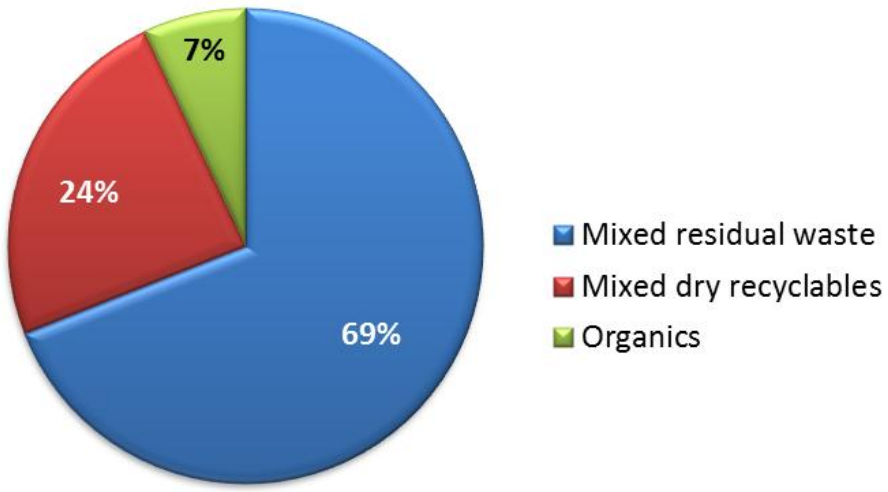


Figure 9: Household kerbside collections in 2011 (% by weight)

As outlined in Table 10, the total quantity of household waste collected at kerbside increased marginally by 1% in 2011 (1,116,556 t compared to 1,105,515 t in 2010). There was a 21% increase in the tonnage of kerbside organics collected, reflecting that more households had a kerbside organic bin collection in 2011.

[37] Although only 81 private sector operators reported the number of households they served.

Table 10: Household kerbside collection tonnages, 2010 and 2011

	Kerbside MRW (t)	Kerbside MDR (t)	Kerbside organics (t)	Kerbside glass (t)	Total (t)
2010	773,321	264,170	63,836	4,188	1,105,515
2011	765,312	269,382	77,494	4,367	1,116,565
Difference	**-1%**	**+2%**	**+21%**	**+4%**	**+1%**

A survey of the character and composition of collected household waste is available on the Waste Characterisation section of the EPA website www.epa.ie, and summarised in Appendix F of this report.

Summary information on household waste collection is shown in Appendix B.

CSO's census data indicate that there were 1,705,394 occupied houses in the State in April 2011 (see also Table 11). Waste collection permit holders and local authorities reported providing a household kerbside collection service to 1,197,928 dwellings (approx. 70%), which was further broken down into:

- 26,631 households (2%) on a single bin (black bin) service only;
- 723,374 households (61%) on a 2-bin service only (residuals bin and dry recyclables bin); and
- 447,923 households (37%) on a 3-bin service (residuals bin, dry recyclables bin, and organics bin).

These data imply that 30% of occupied houses in the State do not avail of, or are not offered, a kerbside collection service. This is considered to be an overestimation for a number of reasons (i) not all waste collection permit operators report accurately on the number of apartments they service, therefore the number of households serviced is under-estimated (apartments accounted for 11% of households in the State in 2011) (ii) it is difficult for operators who offer a 'tag-a-bag' service to estimate the number of households that these customers represent (iii) many households share a kerbside bin service with relatives/neighbours and this number of households is an unknown quantity at present. Finally, other households may have a kerbside collection service available to them, but opt to bring their waste to bring banks/civic amenity sites, and so while these households are not availing of a collection service at kerbside, they are not illegally disposing of their waste.

Table 11: Percentage of occupied houses on a collection service

Housing stock 2011	CSO census data	1,994,845
Vacant dwellings 2011	CSO census data	289,451
Number of occupied houses 2011	CSO census data	1,705,394
Number of houses on a collection service 2011	Local authority data	1,197,928
% occupied houses on a collection service	70%	

Figure 10 presents 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 with a collection service in 2011. The figures indicate that 98% of serviced households have at least a 2-bin service. It is thus clear that 98% 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).

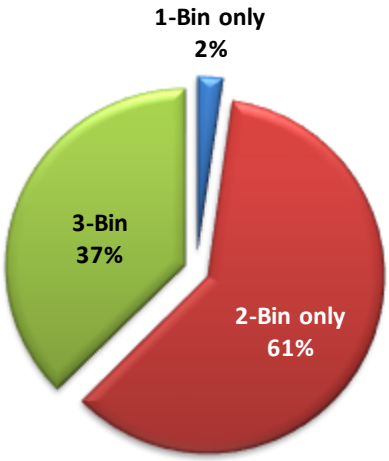


Figure 10: Proportion of households on kerbside waste collection services by bin service type

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

Local authority area	Service provider(s) (private sector = PS local authority = LA)	Kerbside service provided				Combined private and local authority serviced[38]	
		MSW / residual	MDR (2nd bin)	Organic (3rd bin)	Glass (4th bin)	2-bin market penetration	3-bin market penetration
Carlow	PS	✓	✓	✓	✓	61%	39%
Cavan	PS	✓	✓	✓		80%	8%
Clare	PS	✓	✓	✓	✓	35%	62%
Cork City	PS & LA	✓	✓		✓	99%	0%
Cork County	PS	✓	✓	✓	✓	99%	0%
Donegal	PS	✓	✓			77%	0%
Dublin City	PS & LA	✓	✓	✓	✓	38%	62%
Dun Laoghaire Rathdown	PS & LA	✓	✓	✓	✓	56%	43%
Fingal	PS & LA	✓	✓	✓	✓	20%	80%
Galway City	PS & LA	✓	✓	✓	✓	13%	87%
Galway County	PS	✓	✓	✓		82%	18%
Kerry	PS & LA	✓	✓	✓	✓	86%	14%
Kildare	PS & LA	✓	✓	✓	✓	64%	36%
Kilkenny	PS & LA	✓	✓	✓		90%	5%
Laois	PS	✓	✓	✓	✓	38%	60%
Leitrim	PS	✓	✓			100%	0%
Limerick City	PS	✓	✓	✓	✓	53%	47%
Limerick County	PS	✓	✓	✓	✓	52%	48%
Longford	PS	✓	✓	✓		67%	30%
Louth	PS	✓	✓	✓		68%	24%
Mayo	PS	✓	✓	✓		79%	19%
Meath	PS	✓	✓	✓		82%	1%
Monaghan	PS	✓	✓	✓		85%	13%
North Tipperary	PS	✓	✓	✓		74%	24%
Offaly	PS	✓	✓	✓		78%	19%
Roscommon	PS	✓	✓	✓		74%	26%
Sligo	PS	✓	✓	✓		94%	2%
South Dublin	PS & LA	✓	✓	✓	✓	25%	74%
South Tipperary	PS & LA	✓	✓	✓	✓	82%	16%
Waterford City	PS & LA	✓	✓	✓		10%	90%
Waterford County	PS & LA	✓	✓	✓		30%	70%
Westmeath	PS	✓	✓	✓		98%	1%
Wexford	PS & LA	✓	✓	✓		73%	27%
Wicklow	PS	✓	✓	✓		94%	5%

(Source: Local authority survey, CSO)

[38] Calculations 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. No information available for 2011 on the number of households serviced with a 4th bin, only the tonnage collected.

Table 13 presents more detailed data on the collection of organics (household kerbside collections of organic waste (brown bin) and organic waste brought by householders to civic amenity sites/bring centres). There was a 21% increase in the tonnage of organic waste reported as collected at kerbside (from 63, 837 t in 2010 to 77,494 t in 2011). Organic kerbside collections rolled out in a further three local authority areas in 2011 (Cork County, Kilkenny and South Tipperary County Councils).

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

Local authority area	2010		2011	
	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	0	907	0	376
Cavan	0	109	0	36
Clare	0	875	0	1,069
Cork City	0	0	0	0
Cork County	0	0	0	1,354
Donegal	0	0	0	
Dublin City	15,894	132	15,572	1,103
Dun Laoghaire Rathdown	0	22	0	2,408
Fingal	15,701	1,567	12,673	5,444
Galway City	3,457	1,981	3,309	1,695
Galway County	0	1,172	0	1,962
Kerry	358	139	411	138
Kildare	0	4,322	208	3,959
Kilkenny	0	0	0	154
Laois	0	100	0	546
Leitrim	0	0	0	0
Limerick City	0	259	0	605
Limerick County	0	1,060	0	1,309
Longford	0	119	0	326
Louth	0	2,646	0	2,435
Mayo	0	579	0	865
Meath	0	160	0	144
Monaghan	0	421	0	411
North Tipperary	0	123	0	442
Offaly	0	130	0	456
Roscommon	0	103	0	514
Sligo	0	25	0	72
South Dublin	2,736	171	1,723	7,722
South Tipperary	0	0	0	523
Waterford City	3,083	751	349	2,897
Waterford County	1,853	335	1,752	442
Westmeath	0	1	0	12
Wexford	57	2,232	50	2,005
Wicklow	0	258	0	24
Sub-totals (t)	**43,139**	**20,698**	**35,839**	**41,655**
Totals separate kerbside collection (t)	**63,837**		**77,494**	
Household organic waste collected at civic amenity sites & bring centres (t)	21,422		18,539	
Totals kerbside collection plus civic amenity sites & bring centres (t)	**85,259**		**96,034**	

(Source: Local authority survey)

There was negligible tonnage collected (<200 t) in five local council areas (Figure 11). An amount of 18,539 t of household organic waste (mainly green waste) was separately collected at civic amenity sites in 2011 (a slight decrease on the 21,422 t reported in 2010).

By end 2011, thirty-one of the thirty-four local authority areas had at least two operators offering a household kerbside organic bin collection, (although the data do not capture the extent to which the service is offered over the geographical area of the functional area). The three local authority areas without any organic bin kerbside service reported in 2011 were Cork City, Donegal and Leitrim. The market penetration of the 3-bin service varied hugely (1% to 90%) across local authority areas where the service was available (Tables 12 and 13).

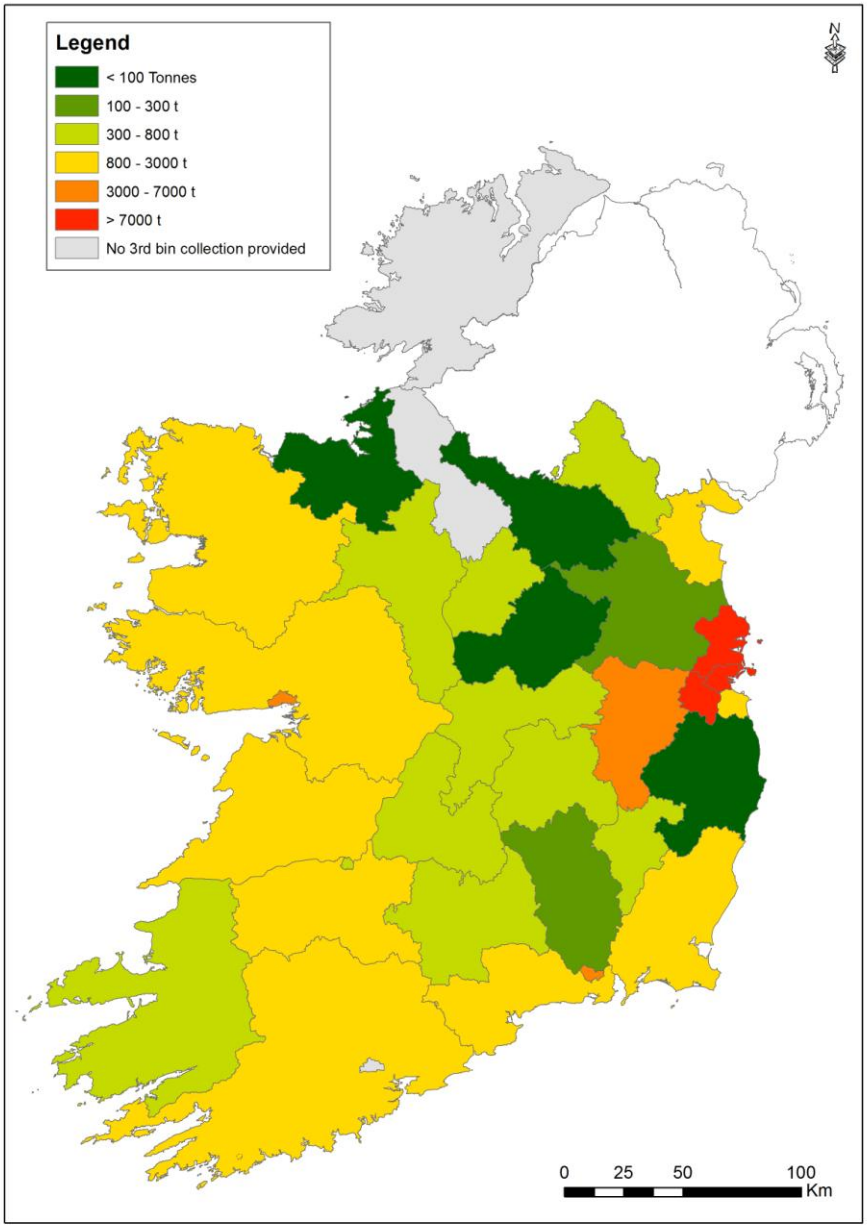


Figure 11: Kerbside collection of household organic waste in 2011 by local authority area

4.3.3 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 is continuing to decrease since a peak in 2007/2008. Appendices C and D provide information on waste types and respective quantities collected at bring banks and civic amenity sites by householders in 2011. Some civic amenity sites also accept waste for disposal in addition to recovery, eg 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 16% in 2011, emphasising the importance of such community infrastructure in the national waste management strategy.

4.3.4 Uncollected household waste

According to information provided by waste collection permit holders and local authorities in the household waste collection market, approximately 70% of occupied Irish households availed of kerbside collection in 2011. 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 2011, the national estimate of uncollected household waste was 276,665 t.

There will be an environment module in the Central Statistics Office’s Quarterly National Household survey (QNHS) in late 2013. 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. The EPA is working with the CSO and other stakeholders to include some household waste management questions in this module, in order to have a statistically valid survey of household waste management behaviours to assist in the implementation and evaluation of national waste policy. The module will seek to understand what options in respect of waste management are available to, and availed of by households, including bin-sharing practices, management of household hazardous wastes and home composting.

4.4 Commercial waste

Commercial waste as reported here is municipal waste collected from commercial premises (eg shops, pubs and restaurants) as well as wastes arising from municipal premises such as schools and hospitals, and non-process industrial waste (eg factory canteens and offices). After household waste, this waste stream is the next largest component of municipal waste.

The EPA has validated data-sets on household waste collected at kerbside and brought to civic amenity sites and bring banks, on household and commercial waste disposed to landfill and on overall municipal waste recovered (eg material recovery facilities, mechanical treatment activities and composters). The commercial waste recovered is estimated from analysis of these datasets.

In order to report on the BMW in MSW disposed, the breakdown of municipal waste into household and commercial is required and has been reported by landfill operators on a quarterly basis since 2010. For recovery organisations accepting dry recyclables, the challenge is to distinguish between commercial waste that is municipal in nature (i.e. similar to household) and non-municipal. Often waste operators record wastes incoming as 'commercial' because they are from commercial customers but the wastes are in fact production process wastes. The challenge is to have adequate waste descriptions on the incoming weighbridge and knowledge of customers to provide this level of detail. Such classifications impact on recycling and diversion figures for municipal wastes and thus on target achievement.

It is hoped that, with the evolution of the NWCPO's e-reporting system for waste collection permit Annual Environmental Returns, commercial waste collection data as reported by collectors can be used in future years. However, this will depend on local authorities undertaking a thorough validation of the data.

The quantity of managed commercial waste in 2011 decreased by 2% compared to 2010 to 1,114,829 t. The recovery rate stands at 49% (Table 14 & Figure 12).

Table 14: Commercial waste management, 2006 to 2011

	2006	2007	2008	2009	2010	2011
Quantity disposed to landfill (t)	601,372	813,818	758,178	640,737	633,010	568,770
Quantity recovered (t)	725,697	735,257	719,219	659,070	508,005	546,059
Recovery rate (%)	55%	48%	49%	51%	45%	49%
Total (t)	**1,327,068**	**1,549,075**	**1,477,397**	**1,299,807**	**1,141,015**	**1,114,829**

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

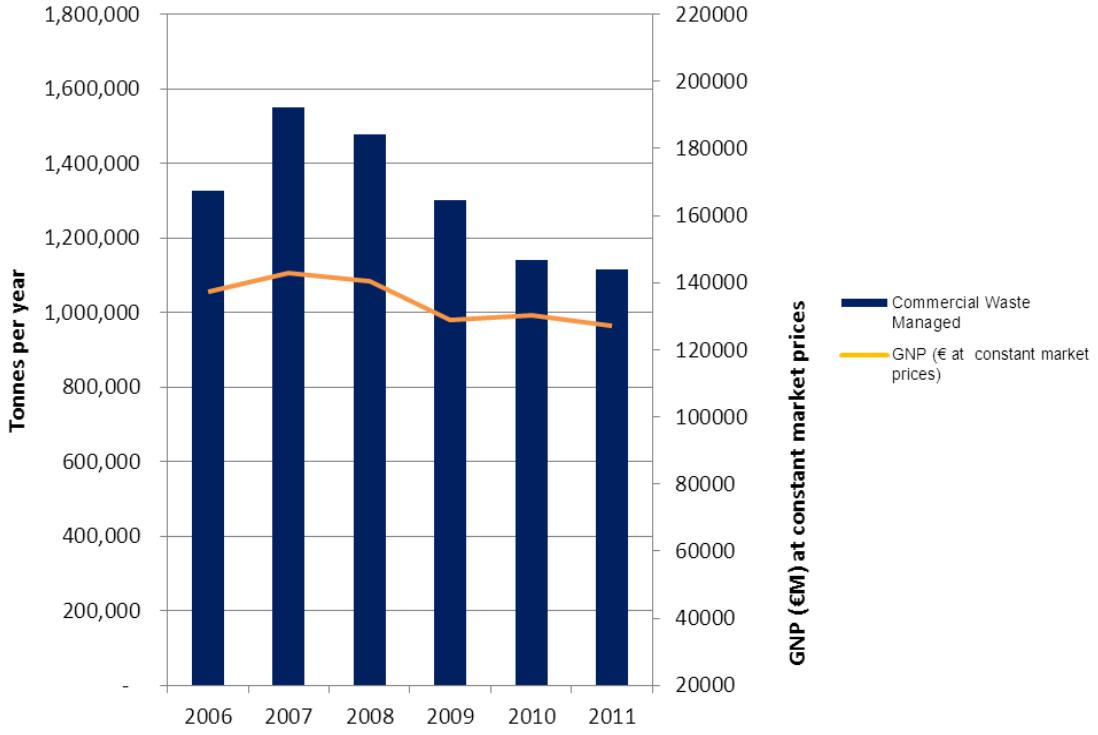


Figure 12: Commercial waste generation and GNP, 2006 to 2011

Figure 13: Commercial waste disposal and recovery trend, 2004 to 2011

As evident from Figure 13, there has been no significant increase in relation to the proportion of commercial waste recovered since 2004, which is a strong indicator of poor market behaviours.

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 from the Waste Characterisation section of the EPA website, www.epa.ie.

4.5 Recovery of municipal waste and economic performance

Figure 14 below tracks recovery of household and commercial waste from 2006 to 2011 along with economic performance (gross national product). The tonnage of household waste recovered in particular is of note, as it continues to increase despite poor economic performance since the economic downturn commenced.

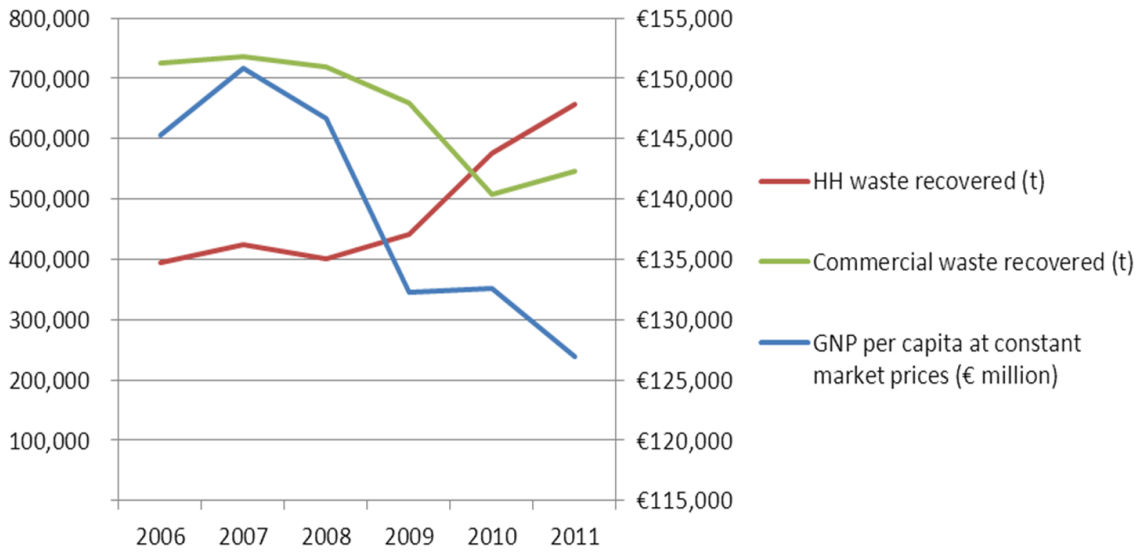


Figure 14: Recovery of household and commercial waste and economic performance

5 BIODEGRADABLE MUNICIPAL WASTE

5.1 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.

There are two key pieces of EU legislation that deal with biodegradable waste. The first is the Landfill Directive[39] (1999/31/EC), which requires the diversion of biodegradable waste from landfill. The second EU instrument is the 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).

5.2 EU Landfill Directive

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[40]) 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 are summarised in Table 15.

Table 15: Targets for biodegradable waste diversion from landfill (per Directive 1999/31/EC)[41]

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

Targets

Target year[42]	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

[39] eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:182:0001:0019:EN:PDF
[40] National Waste Database Report 1995. EPA, 1996.
[41] Revised in the National Waste Report 2008.
[42] The Landfill Directive allows Ireland to avail of a derogation under Article 5 which postponed the 2006 and 2009 targets for 4 years.

5.3 Municipal biodegradable waste arisings

The EPA funded municipal waste characterisation study (2008)[43] 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 the assessment of greenhouse gas emissions.

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 2011 are presented in Table 16. It is estimated that there was 1,789,054 t of BMW in managed municipal solid waste (MSW) in 2011. 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 2011

Municipal waste stream	Tonnage managed	BMW content (refer Appendix H)	BMW arisings 2011
Household	1,406,576	65%	914,274
Municipal sweepings & parks	25,172	65%	16,362
Commercial	1,114,829	77%	858,418
		Total:	1,789,054

EPA municipal waste characterisation studies summarised in Appendix H indicate that organics (food and garden waste) comprise approx. 23% by weight of the gross household bin waste stream and 27.5% by weight of the commercial bin. This equates to an estimate 'available' household organic waste content of approx. 255,803 t in the kerbside collected waste stream, of which 96,034 t (38%) is reported separately collected at kerbside and brought to civic amenity facilities (Table 13). The potential available organic waste in commercial waste stream is 306,578 t.

Even if one factors in the home composting estimate (37,545 t, refer Appendix B) and the organic waste delivered by households to civic amenity sites (18,539 t) there remains a conservative estimate of approx. 122,225 t available organic waste in the managed household waste stream that is not

[43] www.epa.ie/pubs/reports/waste/wastecharacterisation/.

separately collected at kerbside. It is accepted that not all of this potentially 'available' organic material is suitable for brown-bin collection systems (eg food still in packaging). Nevertheless, greater penetration of the third organics bin to householders across the State (currently estimated at only 37% of householders that are on a kerbside collection service) would significantly cut into the available material and divert it from landfill, and it is anticipated that the recently published household food waste and biowaste regulations (S.I. No. 71 of 2013) will assist in this regard for 2013 and beyond.

It is difficult from available records to accurately estimate the proportion of the commercial bin that is separately collected as organics. We know from Tables 5 and 6 that 171,890 t of municipal derived organic wastes was recovered. Removing the household component (96,033 t collected at kerbside and brought to civic amenity sites) leaves an estimated 75,857 t of source separated commercially derived organic waste. It is therefore possible to suggest that an additional 230,721 t of commercial derived organic waste (from the 306,578 t available) is not separately collected, though like household waste not all of this is suitable or available for source separate collection (food waste in packaging). That said, these results suggest that only 25% of the available commercial organic waste is collected and therefore indicates that the 2009 Waste Management (Food Waste) Regulations which place obligations on the commercial sector to segregate food waste have yet to result in appropriate behavioural change.

5.4 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 the quantity of MSW and BMW accepted at the landfill. The EPA has developed an easy to use web-based reporting system to streamline the reporting of BMW data. This web-based system incorporates EPA approved BMW factors necessary to calculate the BMW content of various municipal waste streams.[44]

The overall amount of BMW in MSW landfilled nationally in 2011 as reported by landfill operators to the EPA was 771,551 t (which equates to 57% BMW in MSW). This is less than the Landfill Directive target of 916,000 t. See Table 17 below.

An analysis of the types of MSW accepted for disposal during 2011 is shown in Table 18. When compared to data available for the second half of 2010, there has been an approximate twenty-fold increase in the tonnage of bio-stabilised residual waste sent to landfill, albeit from a very low base (an increase from 971 tonnes pro-rata in 2010 to 19,080 tonnes in 2011). This indicates that there has

[44] www.epa.ie/pubs/advice/waste/municipalwaste/

been an increase in the mechanical-biological processing of MSW. The commencement of the MSW incinerator in Co. Meath in late 2011 is also reflected in the reporting of ash residues landfilled.

Table 17: Tonnage of MSW and BMW accepted at landfills in 2011

Waste Licence No.	Landfill	MSW tonnes	BMW tonnes	% BMW in MSW
W0078-03	Ballaghveny	7,386.24	4,195.88	56.81%
W0009-04	Balleally	47,015.38	24,218.07	51.51%
W0024-04	Ballynacarrick	14,925.90	8,390.93	56.22%
W0165-02	Ballynagran	147,081.30	96,111.72	65.35%
W0109-02	Central Waste Management Facility	29,765.49	18,186.10	61.10%
W0021-03	Derrinumera	32,992.07	19,748.93	59.86%
W0029-04	Derryclure	90,378.50	50,567.77	55.95%
W0074-03	Donohill	11,984.90	7,115.92	59.37%
W0201-03	Drehid	330,702.00	179,095.21	54.16%
W0178-02	East Galway	98,258.46	57,089.04	58.10%
W0017-04	Gortadroma	129,625.45	78,336.07	60.43%
W0191-02	Holmestown	23,184.62	13,172.29	56.81%
W0146-03	Knockharley	88,176.72	48,577.36	55.09%
W0081-04	KTK Landfill	80,808.10	49,956.84	61.82%
W0026-03	Kyletalesha	36,807.51	18,406.44	50.01%
W0001-04	North Kerry	16,315.41	10,301.91	63.14%
W0025-03	Powerstown	6,306.88	3,542.76	56.17%
W0066-03	Rampere	30,070.80	17,173.67	57.11%
W0020-03	Scotch Corner	27,350.81	14,566.46	53.26%
W0060-03	Whiteriver	72,770.27	40,956.27	56.28%
W0068-03	Youghal	25,904.03	11,841.32	45.71%
Totals		**1,347,811**	**771,551**	**57%**

(Source: EPA)

Table 18: BMW content in MSW streams landfilled (during 2011)

Waste Type	MSW (t)	BMW (t)	% BMW in MSW
2-bin residual commercial waste	197,805	148,354	75%
2-bin residual household waste	311,616	196,318	63%
3-bin residual commercial waste	95,452	64,907	68%
3-bin residual household waste	278,678	130,979	47%
Ash residue from MSW incineration	4,691	-	0%
Bio-stabilised residual waste	19,080	-	0%
Bulky waste from sorting of MSW skips	26,990	13,495	50%
Fines residues from MSW bin collections ("wet waste")	18,021	17,120	95%
Fines residues from MSW skips	9,038	3,704	41%
Other (international catering waste, cleansing, facility own-factors etc)	129,275	76,969	60%
Oversize residues from MSW bin collections ("wet waste")	94,769	38,855	41%
Oversize residues from MSW skips	96,457	41,692	43%
Residual MSW from civic amenity facility	20,733	13,062	63%
Residues from source separated recyclable waste ("clean material recovery facility")	16,408	7,712	47%
Untreated 1-bin commercial waste	909	700	77%
Untreated 1-bin household waste	332	216	65%
Untreated cleansing waste (fly-tipping, street bins & sweepings etc)	26,105	16,969	65%
Untreated MSW skip waste	1,449	499	34%
Totals	**1,347,811**[45]	**771,551**	**57%**

(Source: EPA)

5.5 Enforcement by the EPA

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 gave a commitment in its Technical Guidance Document "*Municipal Solid Waste – Pre-Treatment and Residuals Management*" (EPA, 2009) to keep the BMW limits under periodic review as informed by annual waste statistics. In line with that and given Ireland's compliance with the landfill directive BMW targets for 2010 and 2011, the EPA amended the BMW limits in the licences. These amendments were notified to landfill operators in 2012 and are shown in Table 19 below.

[45] There is a slight difference (3,803 t) between the tonnage of municipal solid waste disposal as self-reported to EPA's BMW reporting system and the validated National Waste Report surveys (Appendix E) as reported by landfills. Any discrepancies with individual landfills have been closed out as far as possible prior to reporting.

Table 19 Change in BMW limits in landfill licences

Time period	Previous % BMW Limit	New % BMW limit specified in 2012
To 30 June 2013	47%	55%
1 July 2013 – 30 June 2016	30%	40%
From 1 July 2016	15%	15%

Figure 15 shows the tonnes of MSW and BMW landfilled per quarter versus Landfill Directive Targets since the BMW limits came into force in the landfill licences.

The EPA will continue to assess the BMW reports received. Records and documentation will be examined at waste facilities in order to look behind the system used in determining BMW content of waste disposed of. Appropriate enforcement actions will be taken where necessary.

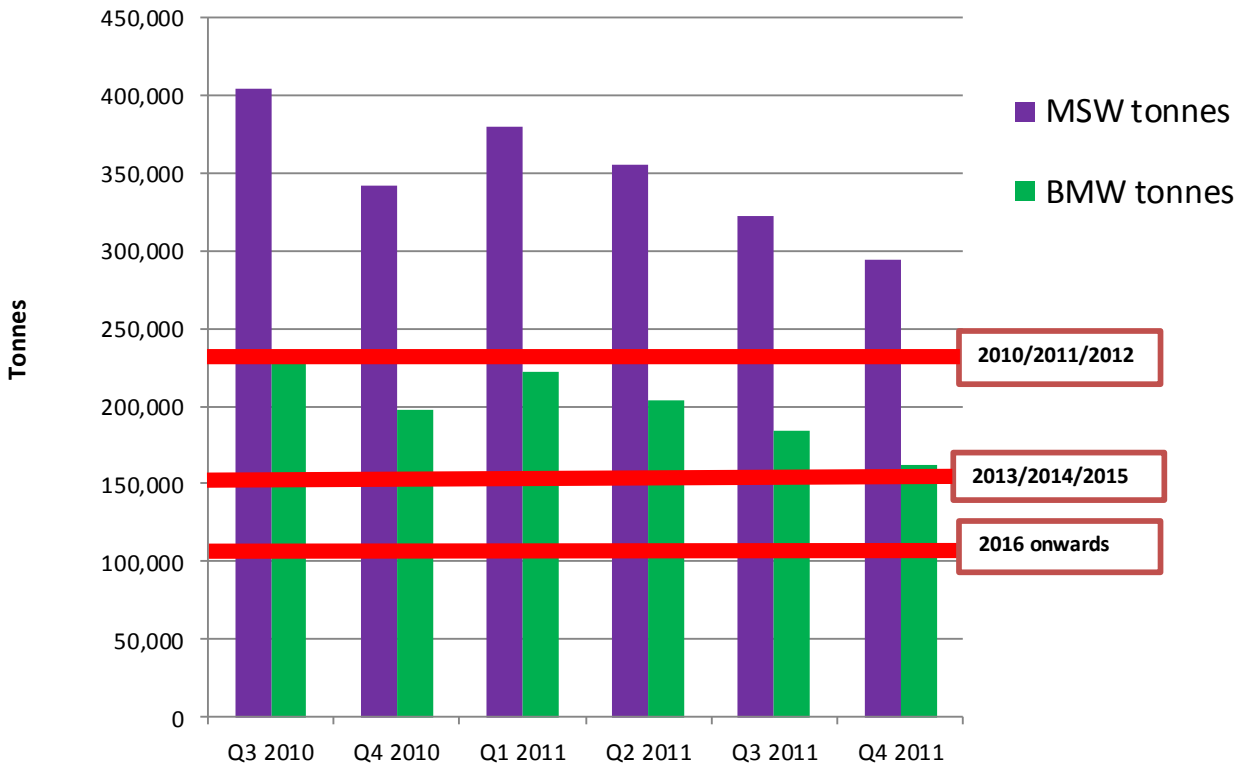


Figure 15: Tonnage of MSW and BMW landfilled per quarter in 2011 versus Landfill Directive Targets

5.6 Future actions for biodegradable waste

The separate kerbside collection of household food and garden waste (in a 3-bin system) has increased in recent years, and 77,494 t was collected from households in 2011. The separate

collection of non-household municipal food waste was reported as 63,000 t in 2011, with 19,000 t of green waste reported collected from non-household sources.[46] The segregation of food waste by major generators within the commercial sector has been a requirement since the obligations of the Waste Management (Food Waste) Regulations 2009 came into effect on 1 July 2010.

In July 2012, the DECLG published a summary a Regulatory Impact Analysis on Household Waste Collection,[47] which recommended that the Government preserves the current household waste collection market structure and strengthens the regulatory regime which applies, which would include mandated service levels including the provision of segregated waste collections. The policy of retaining the current market structure will be reviewed in 2016. The EU (Household Food Waste and Bio-Waste) Regulations, published in March 2013, will place obligations on householders that produce food waste to segregate it and present it for collection. The Regulations will also place obligations on waste collectors to provide a food waste collection service for householders, on a phased basis (based on population agglomerations) from July 2013 to July 2016. It is anticipated that following implementation and enforcement of these Regulations that household food waste will be diverted from landfill.

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 20). To date there has been reported growing development, and consistent operation, of infrastructure to deal with the biodegradable component of the residual bin from municipal waste collections (an increase from 971 t residual biostabilised in 2010 to 19,080 t in 2011). Waste to energy incineration and refuse derived fuel use will certainly contribute, as will mechanical biological treatment (MBT) processes.

The increasing landfill levy and the economic down-turn contributed in significant ways to Ireland's achievement of the first EU Landfill Directive diversion target (July 2010) for biodegradable waste through significant decreases in municipal waste generation and quantity of residual waste consigned to landfill. In order to ensure compliance with future EU targets (particularly as the economy recovers), efforts in waste prevention, diversion to recovery and the development of necessary supporting infrastructure must continue.

The Government increased the landfill levies from €50 per tonne in 2011, to €65 per tonne in 2012 and this is due to rise again in 2013 to €75 per tonne. This levy will make pre-treatment more cost effective - particularly in respect of BMW - thereby reducing the quantities and costs of residual disposal to landfill. Preliminary 2012 data indicates that Ireland is on track to meet the 2013 target, but

[46] Source – waste collection permit annual returns, food waste (EWC 20 01 08) and green waste (20 02 01).
[47] www.environ.ie/en/Environment/RHLegislation/FileDownLoad,30784,en.pdf

we cannot be complacent as this preliminary data suggests we are still at risk of meeting the 2016 target.

Table 20: Distance to future targets for EU Landfill Directive BMW diversion, 2011

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)
2011	**771,551**

Distance to SECOND EU Landfill Directive target (July 2013) (t)
161,551 in excess of target
Distance to THIRD EU Landfill Directive target (July 2016) (t)
344,551 in excess of target

6 MUNICIPAL WASTE INFRASTRUCTURE

6.1 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 treatment infrastructure (such as on-site incinerators) are not dealt with 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 2011 as there currently is no central national register of authorised waste activities.

There are essentially three tiers of waste treatment authorisations. The EPA issue waste licences, local authorities issue waste facility permits and the EPA and local authorities issue Certificates of Registration (EPA issue Certificates of Registration to local authorities, and local authorities issue them to the private sector). There is also the waste collection permitting regime, which has been the responsibility of NWCPO at Offaly County Council since February 2012.

The EPA holds a register of licensed waste activities and certificates of registration issued to local authorities. NWCPO maintains a register of waste collection permit holders. There is however no complete register for local authority issued waste facility permits and certificates of registration. The Waste Permit and Certificate of Registration Database (maintained on EPA's website[48]) is incomplete as not all local authorities have been keeping the database up-to-date. A single (or linked) national register(s) of waste treatment facilities and capacity in the State would significantly enhance national and EU reporting obligations (e.g. Waste Statistics Regulation).

6.2 Municipal landfill

A total of 21 municipal landfills accepted 1,344,008 t of municipal solid waste (MSW) for disposal in 2011. The market share for merchant private and public sector landfill activities for municipal waste is set out in Table 21.

[48] See www.epa.ie/wastepermit/

Table 21: Market share of public and private landfills operating in 2011

Year: 2011	Number of merchant MSW landfills[49]	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)
	5 private sector	42%	74%	55%	99%	81%	56%
	16 local authority						

(Source: Landfill survey)

Across all facilities, 8,008 t of municipal waste were recovered (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.

Total residual municipal waste disposed to landfill in 2011 fell 10% on that disposed in 2010. The 1,344,008 t of municipal waste disposed in the MSW landfills consisted of 750,066 t of household waste, 568,770 t of commercial waste and 25,172 t of municipal sweepings and parks waste (Appendix E). Table 22 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 2011 (composting facility, civic amenity site, waste transfer station) is provided in Appendix F.

6.3 Municipal landfill disposal capacity

At the end of 2011, the remaining capacity of fully consented MSW landfill capacity (i.e. with waste licence and planning permission in place) was approximately 15 Mt nationally (Table 21). 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 (i.e. over one third of remaining national capacity).

A breakdown of MSW disposal capacity by landfill is shown in Table 23 and illustrated in Figure 16. Of the resultant 15 Mt operational municipal landfill capacity nationally, 45% 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 2011 rate of approximately 1.3 Mt per annum, this means that there is approximately 11 years consented municipal waste landfill capacity remaining, i.e. enough capacity to last to circa

[49] Excluding Clonbullogue Ash Depository and Murphy Concrete Manufacturing Ltd.

2022. Significantly, this capacity is not distributed evenly around the State. Some regions such as Donegal are at critical capacity shortage stage. It should be noted that the remaining capacity estimates 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 approx. 7 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 5 of the currently 15 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 more significant inter-regional movement of waste than is already occurring.

Table 22: Municipal waste landfills operating in 2011

EPA licence reg. no.[50]	Landfill	Location	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 (t) (stabilised waste and woodchip) recovered to landfill
W0001-04	North Kerry	Kerry	13,825	892	1,551	**16,268**	0
W0017-04	Gortadroma	Limerick	82,805	467	46,354	**129,626**	0
W0109-02	Central Waste Management Facility	Clare	15,820	808	13,138	**29,766**	0
W0178-02	East Galway Residual	Connaught	50,796	2,631	44,818	**98,245**	0
W0068-03	Youghal	Cork	21,071	2,881	678	**24,630**	0
W0024-04	Ballynacarrick	Donegal	5,981	174	8,764	**14,918**	0
W0009-03	Balleally	Dublin	31,222	975	14,829	**47,026**	0
W0081-04	KTK Landfill Ltd	Kildare	0	1,389	81,466	**82,855**	0
W0201-03	Drehid Waste Management Facility	Kildare	142,157	859	184,331	**327,347**	7,968
W0026-03	Kyletalesha	Midlands	22,531	324	13,889	**36,744**	40
W0029-04	Derryclure	Midlands	87,154	0	3,224	**90,378**	0
W0021-02	Derrinumera	Connaught	27,322	1,268	4,454	**33,044**	0
W0078-03	Ballaghveny	Midlands	4,223	79	2,676	**6,978**	0
W0020-02	Scotch Corner	North East	15,815	702	10,323	**26,840**	0
W0060-03	Whiteriver	North East	58,898	2,569	11,075	**72,542**	0
W0146-02	Knockharley	North East	50,928	2,603	35,530	**89,061**	0
W0025-03	Powerstown	South East	3,508	3,370	534	**7,412**	0
W0074-03	Donohill	South East	7,717	1,244	2,759	**11,720**	0
W0191-02	Holmestown	South East	21,225	1,313	1,383	**23,920**	0
W0066-03	Rampere	Wicklow	17,597	514	9,531	**27,642**	0
W0165-02	Ballynagran	Wicklow	69,473	110	77,463	**147,046**	0
		Total	**750,066**	**25,172**	**568,770**		
					TOTAL MSW disposed to landfill:	**1,344,008**	
					TOTAL MSW recovered to landfill		**8,008**
					TOTAL MSW treated at landfill:		**1,352,016**

(Source: Landfill survey)

[50] Shaded cells are private sector MSW landfills.

Table 23: National MSW landfill disposal capacity (at end of 2011)

EPA Licence Reg. No. [51]	Licensee	Landfill	Approximate remaining disposal capacity (t)[52]	Approximate remaining life expectancy[53] [54] (years)
W0001-04	Kerry County Council	North Kerry	450,000	28
W0017-04	Limerick County Council	Gortadroma	253,000	2
W0021-02	Mayo County Council	Derrinumera	11,243	<1
W0178-02	Greenstar Holdings Ltd	Connaught Regional	763,138[55]	7
W0068-03	Cork County Council	Youghal	750	0
W0161-02	Cork County Council	Bottlehill	*5,392,000*	Not operational yet
W0024-04	Donegal County Council	Ballynacarrick	17,935	1
W0009-03	Fingal County Council	Balleally	26,374	<1
W0201-03	Bord na Móna plc	Drehid WMF	2,520,000[56]	8
W0026-03	Laois County Council	Kyletalesha	206,836	5
W0078-03	North Tipperary Co Co	Ballaghveny	129,045	0[57]
W0077-03	Cavan Co Co	Corranure	150,000	0[58]
W0020-02	Monaghan County Co	Scotch Corner	190,000	7
W0060-03	Louth County Council	Whiteriver	170,000[59]	2
W0146-02	Greenstar Holdings Ltd	Knockharley	1,914,777[60]	21
W0025-03	Carlow County Council	Powerstown	126,225	13
W0074-03	South Tipperary Co Co	Donohill	26,895	2
W0191-02	Wexford County Council	Holmestown	803,280[61]	33
W0165-02	Greenstar Holdings Ltd	Ballynagran	1,350,000	9
			14,501,498	**11**[62]

[51] Shaded cells are private sector MSW landfills.
[52] Based on 2011 landfill AER returns and correspondence from landfill operators.
[53] Based on 2011 fill rate. Remaining lifespan assumes constant MSW and other waste input as that recorded in 2011.
[54] The predicted completion year of closure of all landfills (if sites are fully developed) is subject to disposal rate change.
[55] Landfill operator confirmed that there was a remaining capacity of 763,138 t.
[56] This facility has licence and planning approval to accept 2.52 Mt up to and including 2028, i.e. there may be unconstructed void remaining post closure.
[57] The remaining disposal capacity at end 2011 was 129,045 t, but the landfill closed in February 2011.
[58] The site is closed. There is a licensed annual intake of 45 ktpa, and a capacity to accept approx.150 kt of waste in total. No plans agreed to recommence the operation of this site at the moment.
[59] The operator confirmed that there was approximately 170,000 t remaining capacity in Phase 5. There is approx. 645,000 t capacity in Phase 6 (not developed). It was decided not to develop phase 6 and close after Phase 5 is full. Closure will likely occur in 2013.
[60] The remaining capacity is 2.06 M m^3 and assuming a compaction of 0.93 t/m^3 (for consistency of reporting), the remaining capacity is 1,914,777 t.
[61] The remaining built capacity is approx. 140,000 t. However, there is a capacity of 803,280 t remaining under the waste licence.
[62] This is calculated by dividing the total remaining disposal capacity by total MSW reported as disposed to landfill in 2011. This is only an estimate and assumes no change to disposal rate.

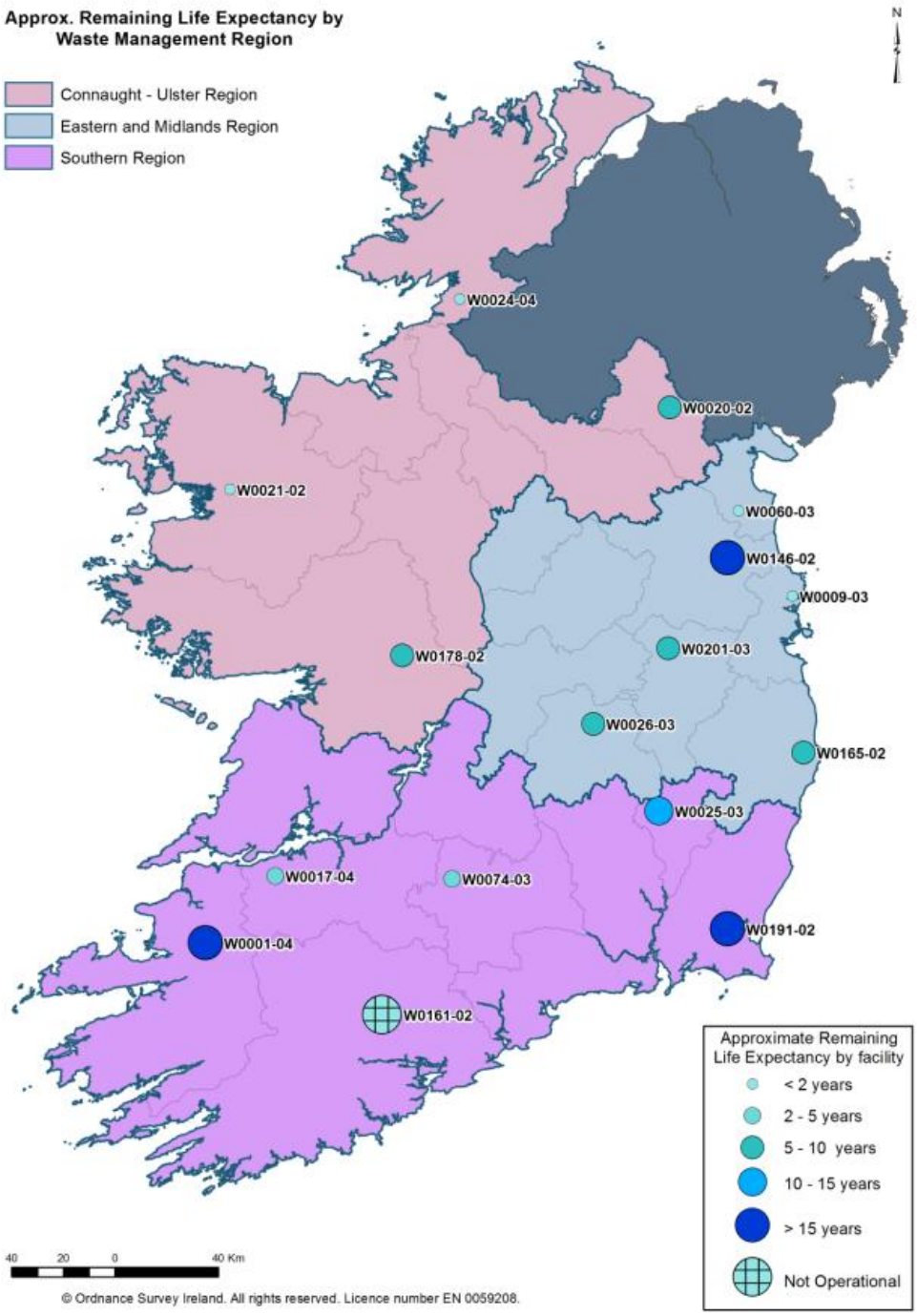


Figure 16: Remaining life expectancy and location of landfills by Waste Management Planning Region

6.4 Integrated landfill facilities

Twenty-one landfills accepted municipal waste for disposal and recovery in 2011.[63] Fifteen of these active landfills (i.e. receiving municipal waste to the landfill void) have other non-landfill associated waste infrastructure (13 had civic amenity sites; one had civic amenity and composting facilities; one had a waste transfer station and civic amenity site).

[63] Bottlehill Landfill, Cork County Council (EPA licence register no. W0161-02) has yet to commence waste acceptance operations.

Twenty one landfills closed to landfill disposal activities were surveyed for this report and seventeen of these had non-landfill associated waste infrastructure (16 civic amenity sites; 3 composting; and 2 had associated transfer/baling operations transfer facilities) (see Appendix F). None of the private municipal landfills offered civic amenity facilities, or reported composting on-site in 2011.

6.5 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 (W0129-02) has submitted an application for a licence review to the EPA, 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.

6.6 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 (W0167-02), currently consented to treat up to 0.2 Mt per year.[64] The EPA has also granted waste licences[65] 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

In 2011 recovery operators reported that 259,429 t of non-hazardous waste was used as a fuel in Ireland and abroad, a 42% increase compared to 2010 (Table 24).

The quantity of refuse derived fuel[66] combusted in Ireland or exported for combustion in 2011 was up 68% on 2010. Within the State, Lagan Cement Ltd (P0487-05), Irish Cement Limited (P0030-04) (Platin works, Drogheda) and Indaver Carranstown (W0167-02) all reported combustion of refuse derived fuel in 2011. Quinn Cement Limited's licence (IPPC Reg. No. 0378-02), granted in July 2012 includes authorisation for combustion of solid recovered fuel. Consented waste to energy capacity in Ireland (merchant incineration and refuse derived fuel in cement kilns and other energy plants) currently stands at 563,000 tpa.

[64] A waste licence review for this facility is with the EPA for consideration, to increase the capacity to 220,000 t.
[65] Further licence details at www.epa.ie.
[66] Where reported by the waste recovery operator as EWC 19 12 10 (combustible waste (refuse derived fuel)).

Table 24: Non-hazardous waste used as a fuel, 2010 to 2011

Material Type	Total (t) 2010	Total (t) 2011
Wood	69,310	43,711[67]
Refuse derived fuel	94,174	158,297
Other non-hazardous wastes	19,293	57,420
Total	**182,777**	**259,429**

(Source: Recovery organisations survey)

6.7 Biological treatment

The *'Market Report on Irish Compost Production and Use'* (rX3, 2012) suggested a national consented capacity for biological treatment of 412,700 tpa.

6.8 Civic amenity site and bring bank infrastructure

Table 25 presents the number of bring banks and civic amenity sites operational in each local authority area between 2007 and 2011. 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 1,922 in 2010 to 1,891 in 2011 and continues a decreasing trend since a peak in 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 increased from 107 to 113 between 2010 and 2011.

Household waste brought to bring banks and civic amenity sites accounted for 16% of managed household waste, which emphasises the importance of this infrastructure and the need to support it, although the tonnage of household waste being brought to such infrastructure is decreasing each year. The factors influencing this could be less household waste generated, increased use of the dry recyclables kerbside bin and collections for charity (eg scrap metal) diverting waste from civic amenity sites.

[67] Includes tonnage imported for use as a fuel.

Table 25: Number and tonnages collected at bring banks and civic amenity sites, 2008–2011

	2008	2009	2010	2011
Number of bring banks	1,989	1,962	1,922	1,891
Collected at bring banks (t)	*102,300*	*91,800*	*82,908*	*82,149*
Number of civic amenity sites	96	107	107	113
Collected at civic amenity sites (t)	*200,455*	*177,158*	*158,303*	*141,235*

(Source: Local authority survey, WEEE and battery compliance schemes)

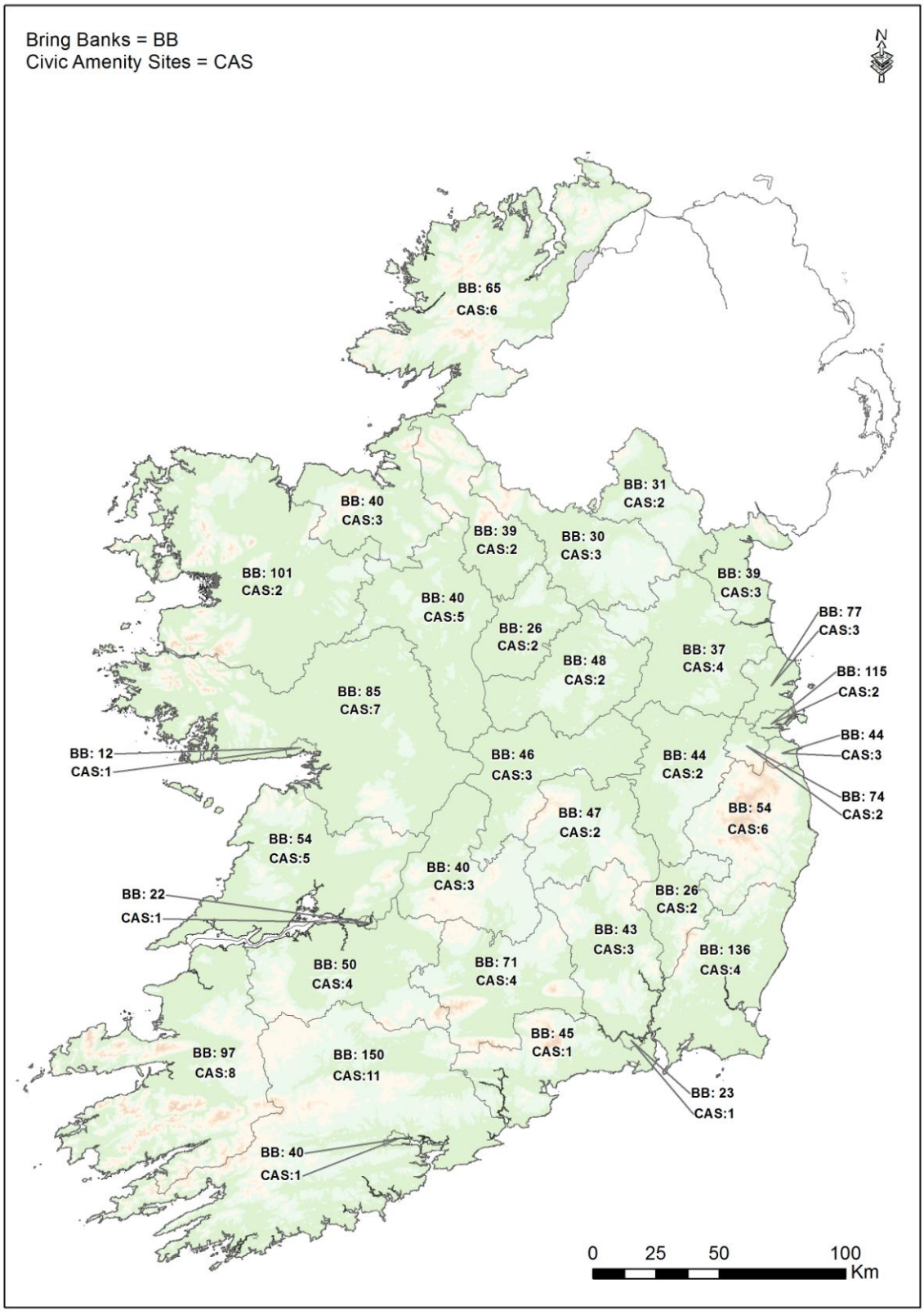
The number of bring banks and civic amenity sites in operation in 2011 by local authority functional area are illustrated in Figure 17 below. For more information on waste accepted at bring banks and civic amenity sites, refer to Appendices B and C.

6.9 Summary of key infrastructure and waste services indicators

Table 26: Summary of key waste infrastructure and waste services indicators

Summary of key waste infrastructure and waste services active in 2011	
Active waste licences	190[68]
Active waste collection permits	4,000[69]
Active waste facility permits	630[70]
Local authority-authorised certificate of registration facilities	304[70]
EPA-authorised certificate of registration facilities	2,293[68]
IPPC facilities accepting municipal solid waste	9[68]
Organic waste treatment facilities	50
Number of active merchant landfills for municipal solid waste disposal	15[68]
Organic waste treatment capacity	412,700 tpa [71]
Waste to energy merchant incineration capacity	200,000 tpa[72]
Refuse derived fuel waste to energy capacity at cement plants	267,875 tpa[68]
Remaining disposal capacity at merchant municipal solid waste landfills	14 Mt[68]

[68] Source – EPA.
[69] Source – NWCPO.
[70] Source - local authority RMCEI plans.
[71] Source – "*Market Report on Irish Compost Production and Use*" (rx3, November 2012). Tonnage specified not limited to municipal waste.
[72] EPA waste licence (W0167-02). Tonnage specified is not limited to municipal waste.



(Source: Local authority survey)

Figure 17: Bring banks and civic amenity sites by local authority functional area.

7 PACKAGING WASTE

7.1 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 2011 (863,597 t) was very similar to 2010 (863,714 t). The quantity recovered increased from 74% in 2010 to 79% in 2011, 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 (eg plastics, wood) by December 2011 and these targets have been met (refer Table 27 below and Table 1).

The quantity of packaging waste landfilled is estimated using waste composition factors.[73] The quantity of packaging waste recovered and recycled[74] is based on data provided by recovery operators through EPA surveys. All packaging reported as sent for recovery is taken as 100% recovered (eg paper and cardboard sent to paper mills abroad) as there is no reason to assume that significant amounts of the material are not recovered, although it would be expected that there would be a certain residual that goes for disposal.

Table 27: Packaging waste managed, 2011

Material	Quantity managed (t)	Quantity landfilled (t)	National landfill rate (%)	Quantity recovered (t)	National recovery rate (%)	Quantity recycled (t)	National recycling rate (%)
Paper and cardboard	334,354	28,483	8.5	305,871	90.5	305,871	91.5
Glass	149,931	28,126	18.8	121,805	81.2	121,805	81.2
Plastic	158,707	83,341	52.5	75,366	47.5	75,366	47.5
Ferrous[75]	45,259	11,775	26.0	33,484	74.0	33,484	74.0
Aluminium	12,002	7,341	61.2	4,661	38.8	4,661	38.8
Textiles	606	606	100	0	0	0	0
Wood	76,388	750	1	75,638	99.0	70,886	92.8
Other[76]	86,349	20,895	24.2	65,454	75.8	235	0.3
Total	**863,597**	**181,317**	**21.0**	**682,280**	**79.0**	**612,309**	**70.9**

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

[73] www.epa.ie/pubs/reports/waste/wastecharacterisation/
[74] Any packaging reported as used as a fuel (R1) was deducted.
[75] This figure does not describe incidental packaging contained in the general ferrous metal stream.
[76] Composites, mixed packaging and refuse derived fuel.

The increase in the recovery rate in 2011 is due to the decrease in the quantity of packaging waste estimated as landfilled, and there was an increase in paper and cardboard, glass , ferrous metals and the packaging element of refuse derived fuel recovered compared to 2010.

The EPA's survey of recovery operators, which gathers data on waste packaging recovered (as reported in Table 27), 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 18 shows the recovery rate for packaging waste from 2006 to 2011.

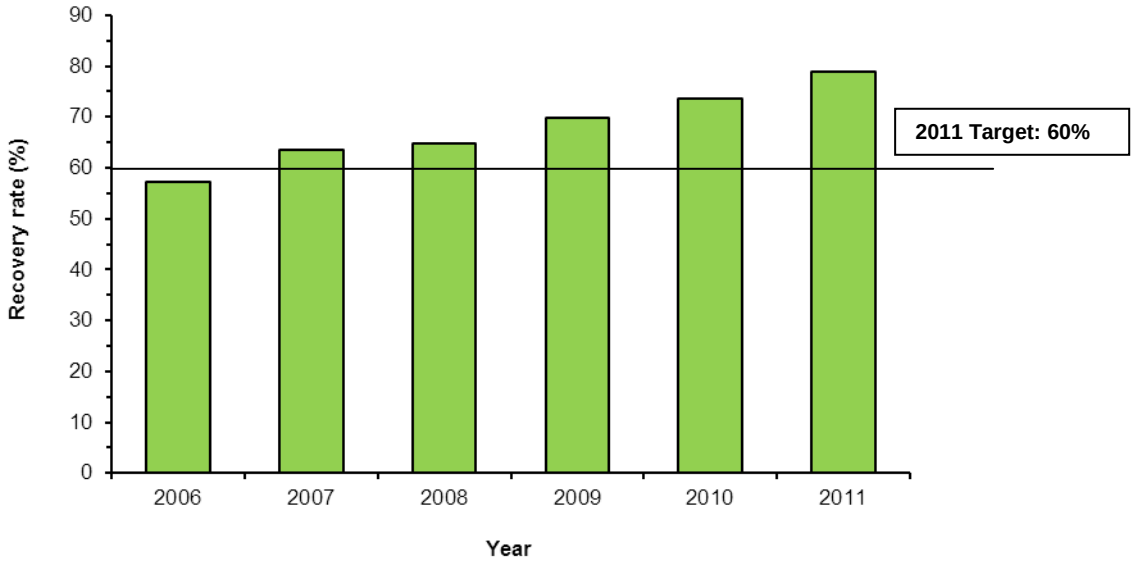


Figure 18: Recovery of packaging waste, 2006–2011, and progress towards targets

7.2 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 28. Five local authorities reported no registered self-compliers in their area in 2011 (Donegal, Leitrim, Sligo, Waterford County and Wexford). Note that Sligo Co Co had one self-complying producer in 2010.

Local authorities reported that a number self-complying producers failed to provide their 2011 packaging recovered data in quarterly reports, therefore the packaging recovered tonnage is an incomplete dataset (Tables 28 & 29). 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.

Table 28: Packaging self-compliers registered in local authority areas in 2011

Local authority	Number of companies	Number of premises	Packaging placed on the market (t)	Packaging recovered (t)[77]
Carlow	1	1	4	2
Cavan	4	4	15,381	1,000
Clare	3	5	3,628	119
Cork City	2	2	28	70
Cork County	5	13	598	512
Donegal	0	0	0	0
Dublin City	18	21	3,256	2,018
Dun Laoghaire-Rathdown	7	8	2,015	1,277
Fingal	19	19	8,095	6,184
Galway City	4	10	338	207
Galway County	4	15	382	458
Kerry	2	3	268	5
Kildare	3	4	108	49
Kilkenny	3	3	251	148
Laois	1	1	21	10
Leitrim	0	0	0	0
Limerick City	1	3	25	14
Limerick County	4	5	6,928	1,031
Longford	3	3	112	83
Louth	4	5	450	285
Mayo	3	3	1,407	1,110
Meath	5	6	1,434	308
Monaghan	4	4	641	406
North Tipperary	1	3	17	10
Offaly	1	3	7	4
Roscommon	5	7	355	193
Sligo	0	0	0	0
South Dublin	23	23	10,870	4,487
South Tipperary	2	2	201	65
Waterford City	1	2	11	6
Waterford County	0	0	0	0
Westmeath	2	5	304	187
Wexford	0	0	0	0
Wicklow	4	4	507	175
Total	**139**[78]	**187**	**57,462**	**20,423**

(Source: Local authority survey)

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

Table 29 compares packaging self-complier data for 2009 to 2011, in terms of number of companies and number of premises registered and the tonnage of packaging placed on the market.

Table 29: Packaging self-compliers, 2009 to 2011

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
2011	139	187	57,462	20,423

(Source: Local authority surveys)

8 WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT

8.1 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[79] transpose the WEEE Directive into Irish law, and obligations under the WEEE Regulations came into effect in Ireland in August 2005. The data on WEEE collection and treatment in Ireland in 2011 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).

8.2 WEEE collected, treated, exported and stored in 2011

Table 30 shows that 41,092 t of WEEE were collected in Ireland in 2011, which is markedly less than the 45,012 t collected in 2010. The average amount of household WEEE collected from each person living in the Republic of Ireland has fallen from more than 8 kg in 2010 to 7.6 kg in 2011. However, this is still nearly double the target of 4 kg per person specified by the WEEE Directive. The drop may in-fact reflect falling consumption of EEE rather than less recovery effort; as that recovered will strongly reflect that placed on the market.

Table 30: WEEE collected, treated, exported and stored in 2011

	Waste fridges and freezers	Waste large household appliances[80]	Waste TVs and monitors	Waste lighting equipment[81]	Other WEEE[82]	Total WEEE
Collected (t)	5,971	13,604	6,651	665	14,202	**41,092**
Treated in RoI (t)	0	8,412	5,842	552	6,653	**21,460**
Exported to EU[83] (t)	5,977	5,160	584	85	7,358	**19,164**
Exported to non-EU (t)	0	0	0	0	83	**83**
Total recovered (t)	5,190	10,989	5,708	560	12,311	**34,759**
Change in stock[84] (t)	-6	32	225	28	107	**386**

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

[79] 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).

[80] For example dishwashers, washing machines, cookers.

[81] 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.

[82] For example stereos, telephones, toys, vacuum cleaners, toasters, computers.

[83] Exports to Northern Ireland amounted to 4,381 t in 2011.

[84] The stock figure describes the difference of the national amount of WEEE collected and awaiting treatment between 1 January 2011 and 31 December 2012.

The collection and recovery of all types of WEEE other than Waste TVs and monitors decreased between 2010 and 2011. The amounts of Waste lighting equipment and Waste large household appliances decrease by 18% and 17%, respectively, whereas the collections of Waste fridges and freezers and Other WEEE fell by 6%.

In 2011, the collection of pre-owned and used EEE for reuse (ie not waste) rose to 569 t. Again, most of the material for reuse consisted of information and communication technology equipment eg mobile phones and computers.

More than half of the total WEEE collected in 2011 was treated in Ireland before being exported to other EU countries for further recovery. In 2011, 83 t of WEEE were transferred directly from Ireland to the United States of America.

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 1 of this report and suggest that in 2011 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.

9 END OF LIFE VEHICLES

9.1 The ELV Directive

Wastes arising from end-of-life vehicles (ELVs) can have many negative impacts upon the environment. In 1997 the European Commission adopted a proposal for a directive aimed at ensuring that the activities of vehicle dismantling and recycling are carried out in an environmentally sound manner. The initial proposal suggested that the identification of clear targets with regards to reuse, recycling and recovery of vehicles and their components be identified and furthermore, producers should be encouraged to produce vehicles that provide a much higher rate of recyclability upon end-of-life. This initial proposal eventually provided the foundation for what would become the ELV Directive (2000/53/EC). The ELV Directive was transposed into national law in 2006[85] and has since served as the strategic framework by which the collection, storage, dismantling and treatment of ELVs is governed.

The directive sets recycling and recovery targets for ELVs and requires that appropriate treatment systems are in place to remove hazardous materials (eg oil, antifreeze, batteries), and materials which may be reused and recycled (eg metals, plastics, glass, tyres) from ELVs.

To ensure that ELV Directive targets are met, a number of steps must be taken not only at the end-of-life stage of a vehicle, but also during the design phase. During the design phase, manufacturers must ensure that the design of new vehicles supports the specific requirements outlined in the ELV Directive with regards to dismantling, reuse and recycling of ELVs and their components. The use of hazardous materials in the production of new vehicles is also strictly controlled. By taking the end-of-life of a vehicle into consideration at the design stage, producers can improve the recyclability of ELVs and thus ensure that ELV Directive targets are met.

The ELV Directive applies to vehicles used for the carriage of passengers with a maximum of eight seats in addition to the driver's seat, and to vehicles with a mass no greater than 3.5 t and used for the carriage of goods. ELV legislation is covered under the 'producer responsibility initiative' set of legislation and therefore producers have certain obligations. Vehicle manufacturers and professional importers, who are responsible for placing vehicles on the market within the State, are collectively defined as producers and as such, they are obliged to create a national collection system to organise the collection, treatment and recovery of ELVs.

Each producer has to contract a network of authorised treatment facilities (ATFs), which must accept ELVs from registered owners free of charge (provided that essential components of the vehicle are not missing). ATFs are subject to a number of conditions and must hold a valid waste

[85] 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.

permit or, where deemed appropriate, a waste licence[86]. Facilities must meet the minimum technical requirements with regards to storage, appropriate treatment and recovery of ELVs. An ATF is also required to keep records of the total weights of materials for reuse, recycling, recovery and disposal that arise from the processing of ELVs.

ELVs must be discarded at an ATF; to do otherwise is an offence. When an ELV is deposited at an ATF, a Certificate of Destruction (COD) is issued free of charge. All relevant information pertaining to that COD is then noted on the National Vehicle Driver File (NVDF), which is maintained by the Driver and Vehicle Computer Services Division of the Department of Transport, Tourism and Sport. It is important to note that only ATFs can issue CODs. If the owner of an ELV does not receive a COD they may still be held on record on the NVDF as the registered owner of that vehicle.

In August 2010, an online ELV processing system was introduced by the Driver Vehicle Computer Services Division (DVCSD) of the Department of Transport. The online system gives ATFs the ability to send ELVs notifications to the NVDF over the internet. The online system can be found at www.motorelv.ie.

9.2 ELV Directive Targets

Each Member State is expected to meet the specific targets set out in the EU ELV Directive with regards to the reuse, recycling and recovery of ELVs. The targets 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.

The EPA carries out a survey of ATFs and ELV shredder operators throughout Ireland on an annual basis and uses the resulting information to build a dataset that is used to calculate rates of reuse, recovery and recycling of ELVs arising in Ireland.

Local authorities reported to the EPA that 136 ATFs were authorised in 2011 (of which 126 were operational). Three local authorities reported no ATFs operational in their functional areas in 2011 (Dun Laoghaire Rathdown, Longford and Waterford City).

The latest ELV data available is for calendar year 2010, where 158,237 ELVs were reported to arise in Ireland. Information on tonnages reused, recycled and recovered from ELV dismantling and depollution is summarised in Table 31.

[86] The EPA, 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.

Table 31: Total reuse, recovery and recycling of ELVs arising in 2010 and treated in the State or abroad

Reuse (t)	Total recycling (t)	Total recovery (t)	Total reuse and recycling	Total reuse and recovery
1,358	128,859	129,614	130,217	130,972
Total number of end-of-life vehicles		158,237		
Total vehicle weight (t)		169,155	77%	77%

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

In 2010, total reuse and recycling was 77% and total reuse and recovery also 77%. These percentages are below the EU targets of 80% reuse and recycling and 85% reuse and recovery which have been in force since January 2006, and significantly below the EU targets of 85% for reuse and recycling and 95% for reuse and recovery, which are due to come into force on the 1st January 2015.

2011 data are at a preliminary stage of analysis and will be finalised prior to reporting to the European Commission in June 2013 (Figure 19). Preliminary analysis of 2011 data indicates that 135,281 ELVs arose in Ireland. During 2011 total reuse and recycling and total reuse and recovery rates were 77% and 79% respectively. 2011 total reuse and recycling rates are therefore still down 4% from 2009. The total reuse and recovery rates decreased in 2010 and 2011 in comparison to 2009 because all auto shredder residue went for disposal to landfill from 2010 onwards whereas previously some of it had been used as landfill cover (and therefore recorded as recovery). The EPA has determined that automobile shredder residue is not a suitable landfill cover material.

The EPA has not ruled out that the preliminary recycling and recovery rates reported here for 2011 are an underestimate because they do not take account of non-metal recycling and recovery from Irish ELVs exported to non-Irish shredders. Irish ATFs have been asked to ensure that they receive credits for non-metal recovery carried out at shedders outside of Ireland. Information on credits obtained for Irish ELVs will be considered when working out the final reuse, recycling and recovery rates for EU reporting.

From 1 July 2012, the landfill levy increased to €65 per tonne for each tonne of waste disposed of at authorised and unauthorised landfill facilities. The Landfill Levy Amendment Regulations[87] also removed the exemption from the levy for non-metallic residues arising from the shredding of white goods, end-of-life vehicles and other metal waste.[88] The levy increase and the removal of the exemption from the levy for shredder residue is likely to encourage the recovery of shredder residue, and therefore increase Ireland's ELV recovery rates over time, although due to the current reuse and recovery/recycling rates from the January 2015 targets, a combination of actions will be required, which could include increased dismantling of non-metallic ELV components prior to

[87] Waste Management (Landfill Levy) (Amendment) Regulations 2012 (S.I. No 221 of 2012)
[88] www.environ.ie/en/Environment/Waste/LandfillLevy/

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).

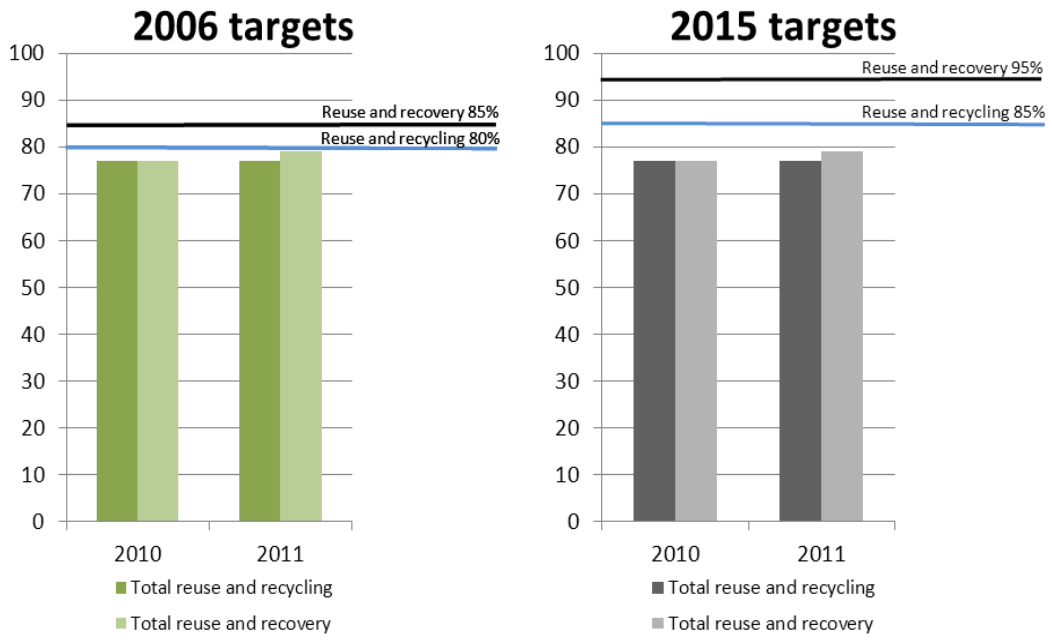


Figure 19: ELV reuse, recovery and recycling rates for 2010 and 2011 compared to ELV Directive targets.

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 (eg 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.

10 WASTE TYRES

10.1 Introduction

In 2011 approximately 19,092 t of waste tyres were reported to have been managed in the State. This is a considerable amount of waste tyres and it is important to ensure that steps are taken to manage them in an environmentally sound manner.

On 1 January 2008 the Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007) came into force. The primary aims of these regulations were to increase the efficiency of waste tyre flow tracking and to improve the quality of the data captured, as up to this point information on waste tyre generation and management was scarce. The new tracking system put in place is to provide a greatly improved understanding of waste tyre flows within the State. The 2007 Regulations require that operators within the tyre industry submit information regarding the waste tyres they handle in a calendar year to either their local authority or a compliance scheme. There are currently two tyre compliance schemes in Ireland, the Tyre Recovery Activity Compliance Scheme (TRACS, www.tracsireland.ie/) and the Tyre Waste Management Scheme (TWM, www.twm.ie/).

10.2 Waste tyre management in 2011

To obtain information on waste tyre management in the Republic of Ireland during 2011, the EPA summarised data contained in National Waste Report survey returns and contacted a number of additional organisations involved in the handling of waste tyres. As some of these organisations failed to provide information our reported tonnage of waste tyres arising is therefore likely to be an underestimate. The EPA will consider appropriate enforcement action to ensure future statutorily specified reporting obligations are complied with.

Table 32 shows that the majority of waste tyres arising in the State in 2011 were exported in 2011. Almost 7% of the total exports of 10,253 t were sent to Northern Ireland. Approximately 7,754 t, accounting for 40.6% of total waste tyres arising in the State, were chipped, 843 t of waste tyres were used as 'ballast', 207 t bailed and processed into concrete blocks and 35 t of waste tyres were re-treaded

Tyres that are in good condition may be sold for reuse[89] and, in accordance with the Waste Framework Directive (2008/98/EC), they are not considered to be waste. In 2011, 189 t of tyres were reported as sold for reuse.

[89] S.I. No. 664 of 2007 defines reuse as the use of a waste tyre, either for the same purpose or, as appropriate, a different purpose without the need for reprocessing. This is a different definition for reuse than in other waste legislation.

Table 32: Waste tyres treated and exported in 2011.

Waste tyre activity	Tonnage (t)	Percentage
Exported	10,253	53.7%
Chipped	7,754	40.6%
Ballast	843	4.4%
Baled	207	1.1%
Re-treaded	35	0.2%
Total	**19,092**	100%

(Source: National Waste Report survey returns)

11 CONSTRUCTION AND DEMOLITION WASTE

11.1 C&D waste collected in 2011

It is estimated that 3,003,691 t of construction and demolition (C&D) (hazardous and non-hazardous) waste was collected in 2011, a decrease of 13% since 2010. The quantities of C&D wastes arising has been decreasing since a peak in 2007, and is reflective of the economic downturn and its effect on the construction sector. The bulk of the tonnage collected in 2011 was made up of soil and stones (1,975,844 t), with the remaining 1,027,847 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 returns submitted by waste permit collection holders. There were approximately 222 active waste collection permit holders authorised to collect C&D waste in 2011.[90]

11.2 C&D waste treated in 2011

Information on the quantity of C&D waste treated (either recovered or disposed) in 2011 was derived from the following sources:

(i) EPA licensed activities (landfills and waste treatment facilities).
(ii) Local authority permitted and Certificate of Registration facilities.

The quantity of C&D waste managed in 2011 (2,498,946 t) represented a 3% decrease on that reported in 2010. In 2011, 2,358,714 t of C&D waste was estimated as recovered and 35,404 t (2% of overall managed) was disposed at EPA licensed landfills (Tables 33 & 34).

Table 33 outlines the collection and management of the soil and stones (hazardous and non-hazardous) element of C&D waste. In 2011, more soil and stone was reported as collected (1,975,844 t)[91] than was reported as managed (1,538,903 t).

[90] It was not possible to get an accurate figure from the WCP e-reporting systems for 2011 data.
[91] In 2011, approx. 149,787 t of C&D material was reported as accepted at EPA licensed landfills. Although this tonnage was reported as collected in 2011, it has been excluded here from both the 'waste collected' and 'waste managed' figures. These entries were deemed to be reused at the landfill and are not reported as waste.

Table 33: Collection and management of C&D soil and stones, 2011

Collection of soil & stones (t)					1,975,844
Management of soil & stones	**Recovery in RoI (t)**	**Disposal in RoI (t)**	**Recovery abroad (t)**	**Disposal abroad (t)**	**Total (t)**
Recovery at EPA-licensed landfills *(cover/landscaping material or other landfill engineering purposes)*	225,873				225,873
Disposal at EPA-licensed landfills		23,400			23,400
Recovery at local authority-permitted sites	1,032,164				1,032,164
Treatment of contaminated soil	7,094			10,203	17,297
Recovery at EPA licenced facilities	135,341				135,341
. ..in storage at the end of 2011					11,957
....estimations for non-submission of waste facility permit AERs					92,870
Grand total soil & stones managed (t)					**1,538,903**

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

Table 34 outlines the collection and management of the non-soil and stones fraction of C&D waste. In 2011, the quantity of non-soil and stone C&D waste collected exceeded the quantity reported as managed by 67,804 t (7%).

Table 34: Collection and management of C&D waste (excluding soil and stones), 2011

Collection of C&D waste (other than soil & stones) (t)					1,027,847
Management	**Recovery in RoI (t)**	**Recovery abroad (t)**	**Disposal in RoI (t)**	**Disposal abroad (t)**	**Total (t)**
Metal	4,579	329,771			334,350
Wood	31,678				31,678
Glass			27		27
Gypsum-based waste	487				487
Rubble	158,835		17		158,852
Mixed or other C&D waste	409,491		5,657	19,501	434,649
...remaining in storage at the end of 2011					45,968
Grand total (t)					**960,043**

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

11.3 C&D waste data anomalies

There is a 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 0.4 Mt (21%) for soil and stones fraction and a gap of 0.1 Mt (7%) for the non-soil and stones fraction, resulting in an overall gap of just under 0.5 Mt.

Local authorities reported that there were 222 active waste facility permit holders authorised to accept C&D waste in 2011. Of these, 184 submitted an AER to the local authorities, representing an 83% reporting rate. Local authorities estimate that there may have been an additional 92,870 t of C&D recovered at local authority permitted sites in 2011 based on the 38 non-reporting facilities. This has been reflected in the tables above. Data gathered for the National Waste Report indicates that waste treatment organisations had a net storage of 57,925 t of C&D waste at their facilities during 2011. This figure has also been included in the total reported management of C&D figure above.

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 (CoR). Although AER data from local authority issued CoR sites have been included in 2011 figures, data for CoR facilities authorised by the EPA are not included. Current estimates for tonnage of C&D managed at EPA CoR sites are at present unreliable. It is estimated that approx. 450,000 t of C&D waste is managed at EPA issued CoR sites. This is based on a potential tonnage (minimum intake of 2,000 t per year) across 226 sites. EPA authorised CoR sites (C&D classes) will be surveyed in future campaigns.

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. Most of the sites generating this waste stream and those receiving it do not have weighbridges, so estimations are made (by carriers and recipients) which is not ideal for reconciliation. 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 2011 but in storage at the end of 2011 will not be counted as treated (i.e. until it is either recovered or disposed so stockpiling of C&D waste can affect the dataset. In Tables 31 and 32 above, data on C&D waste in storage is reported, although this is only data from sites that the EPA surveys for National Waste Report, and as EPA does not have storage data for all sites managing C&D waste this is considered to be an underestimate.

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 importance of good record keeping by waste operators cannot be over emphasised. Additional enforcement and data verification efforts by the local authorities may be necessary to ensure that this happens. 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. 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 potentially the operator has reported in kilograms versus tonnes in error) should be queried.

12 HAZARDOUS WASTE

12.1 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 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 2011 was compiled from three sources, based on the location of treatment:

- Data on hazardous waste treatment on-site at the industry where it was generated (which occurs under EPA licence at companies mainly in the pharmachem sector) were obtained from licensee's Pollutant Release and Transfer Returns (PRTR) and Annual Environmental Reports.
- Data on hazardous waste treatment at commercial facilities in Ireland were 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 were provided by the National Transfrontier Shipment Office (NTFSO) at Dublin City Council.

The total amount of hazardous waste managed in 2011 is presented in Table 35 and illustrated in Figure 20. The total amount of hazardous waste managed in 2011 is similar to that managed in 2010. Of the total managed, 22% is treated on-site at industry, 31% is sent off-site to a commercial hazardous waste facility for treatment, and 47% is exported for treatment.

Table 35: Summary of hazardous waste management, 2006–2011 (excluding contaminated soil)

Category	2006	2007	2008	2009	2010	2011
On-site at industry[92] (t)	88,409	82,732	72,038	74,668	76,655	67,772
Off-site in Ireland[93] (t)	60,872	91,240	113,839	89,992	93,048	98,837
Exported (t)	134,904	147,542	157,207	150,395	143,180	149,037
Total (t)	**284,184**	**304,941**	**319,098**	**289,910**	**287,874**	**287,376[94]**

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

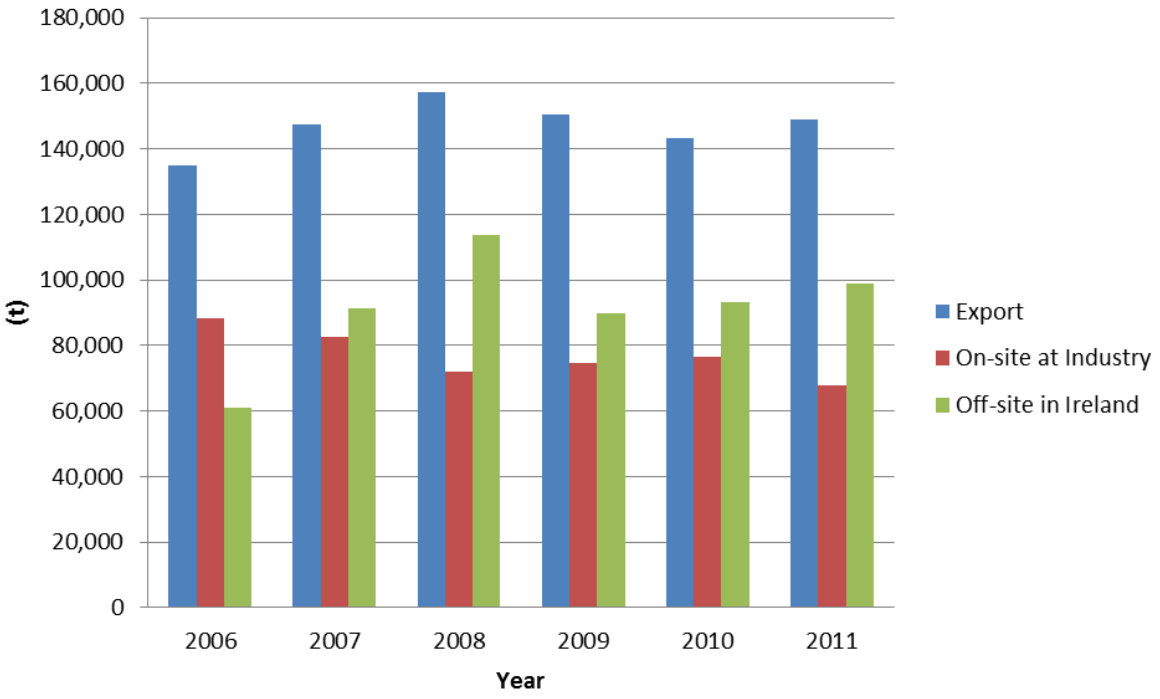


Figure 20: Location of hazardous waste treatment 2006-2011 (excluding contaminated soil)

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

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

[94] A reported 28,270 t of hazardous waste was blended at facilities in Ireland prior to export as a waste for further treatment (27,058 t reported as exported for use as fuel in cement kilns, a further 1,212 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, 2009 and 2010 to avoid double counting in the total amount of hazardous waste managed.

12.2 Hazardous waste treatment in Ireland

The reported quantity of hazardous waste treated in Ireland in 2011 was 166,610 t, which is a decrease of 2% since 2010 (Table 36). There was a 12% decrease in the treatment of hazardous waste on site at industry in 2011, and a 6% increase in the treatment of hazardous waste off-site at commercial facilities in Ireland. 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 oils and solvents.

Table 36: Location of hazardous waste treatment in Ireland, 2011 (excluding contaminated soil)

Category	On-site at industry[95] (t)	Off-site in Ireland[96] (t)	Total (t)
Solvents	34,354	16,898	51,253
Solvents (halogenated, where specified)	6,176	631	6,807
Oil waste (mineral oil)	180	38,092	38,272
Industrial hazardous waste (other)	4,722	3,046	7,768
Salts and saltcake	20,079	4	20,083
Healthcare risk waste		9,036	9,036
Oily sludges	45	3,464	3,509
Equipment (electrical, electronic, mechanical)		7,404	7,404
Chemical waste (other)		120	120
Paint, ink and varnish waste (including packaging)		1,358	1,358
Acid and alkali waste		3,777	3,777
Aqueous washing liquids and mother liquors (07 __ 01*)	1,852	11,937	13,789
Solid wastes from MFSU of pharmaceuticals (07 05 13*)	295	0	295
Sludges and filter cakes	0.2	132	132
Packaging (contaminated or containing residues)	25	2,068	2,093
Photographic chemical waste		95	95
Metal- and heavy metal-containing waste		8	8
Absorbents, wiping cloths etc. (EWC 15 02 02*)	30	2	32
Fluorescent lamps		260	260
Oil filters		7	7
Laboratory and general chemical waste	13	59	72
Thermal treatment and combustion residues		438	438
Municipal hazardous waste (other)		4	4
Totals	**67,772**	**98,838**	**166,610**

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

Table 37 identifies the reported recovery and disposal classes for hazardous waste managed within the State (64% recovery and 36% disposal operations). Of the total quantity disposed, 43% was treated by physico-chemical treatment, 21% was incinerated without energy recovery and 33% was landfilled. Of the

[95] 'On-site at industry' refers to hazardous waste treated on-site at the industrial facility where it was generated, under IPPC licence.
[96] 'Off-site in Ireland' refers to waste sent to EPA-licensed commercial hazardous waste treatment facilities in Ireland for treatment.

total quantity of hazardous waste recovered in the State, 30% was solvent recovery and 13% was oil recovery.

Table 37: Methods of treatment of hazardous waste in Ireland in 2011 (excluding contaminated soil)

Recovery or disposal code[97]	Disposal or recovery activity	On-site at industry[98] (t)	Off-site in Ireland[99] (t)	Total (t)
D1	Landfill	20,079		20,079
D8	Biological treatment	1,655		1,655
D9	Physico-chemical treatment	122	25,959	26,081
D10	Incineration without energy recovery	12,615		12,615
	Sub-total disposal:	**34,471**	**25,959**	**60,430**
R1	Use as fuel	11,012		11,012
R2	Solvent recovery	21,770	27,978[100]	49,748
R3	Organic substance recovery	294	61	355
R4	Metal recovery		369	369
R3/R4	Combination of organic substance recovery and metal recovery		1,522	1,522
R5	Inorganic substance recovery		5,842	5,842
R4/R5	Combination of metal recovery and inorganic substance recovery		346	346
R9	Oil recovery	180	21,217	21,397
R4/R9	Combination of metal recovery and oil recovery		1,562	1,562
R9/D9	Combination of oil recovery and physic-chemical treatment		12,911	12,911
R10	Landspreading	45		45
D13/R12	Combination of blending or mixing prior to disposal/waste exchange prior to recovery		1,071[101]	1,071
	Sub-total recovery:	**33,301**	**72,877**	**106,178**
	Total (t):	**67,772**	**98,837**	**166,609**

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

12.3 Hazardous waste exported for treatment

There was a 4% increase in the quantity of hazardous waste exported for treatment in 2011 compared to 2010. The increase in the quantity of hazardous waste exported for treatment in 2011 compared to 2010 is mainly due to increases in the tonnage of solvents, thermal treatment and combustion residues and WEEE exported.

[97] See Appendix G for a descriptive list of recovery and disposal operations.
[98] 'On-site at industry' refers to hazardous waste treated on-site at the industrial facility where it was generated.
[99] 'Off-site in Ireland' refers to waste sent to commercial hazardous waste treatment facilities in Ireland for treatment.
[100] This figure is made up of 26,895 t solvent waste blended prior to its export as waste for use as fuel in cement kilns, 609 t of waste solvent which was recovered and sold as product and 474 t of hazardous wastes sent abroad for incineration.
[101] Represents the blending and storage of mixed solvents and aqueous liquids prior to their export for use as fuel as well as incineration.

Solvents account for 40% of hazardous wastes exported, followed by WEEE (12%), lead acid batteries (10%), aqueous washing liquors and mother liquors (6%), chemical waste (6%), other industrial hazardous waste (5%) and asbestos waste (5%). These waste categories account for 83% of total waste exported by weight (see Table 38 for more information).

Table 38: Categories of reported exports of hazardous waste, 2008-2011

Category	Exported (t) 2008	Exported (t) 2009	Exported (t) 2010	Exported (t) 2011
Solvents	58,611	52,370	48,682	52,243
Solvents (halogenated, where specified)	8,693	4,540	1,893	6,079
Oil waste (mineral oil)	230	2,443	2,363	633
Industrial hazardous waste (other)	33,154	11,927	5,124[102]	7,027
Healthcare risk waste	728	734	712	692
Oily sludges	107	94	45	30
Lead-acid batteries	11,050	11,832	14,805	15,374
Equipment (electrical, electronic, mechanical)	7,386	8,410	11,897	17,493
Chemical waste (other)	3,559	3,701	7,780	9,305
Paint, ink and varnish waste (including packaging)	4,843	4,834	5,459	4,713
Acid and alkali waste	2,917	2,578	1,556	1,558
Asbestos waste	7,007	14,068	9,512	7,001
Aqueous washing liquids and mother liquors (07 __ 01*)	5,278	10,647	12,637	9,616
Solid wastes from MFSU of pharmaceuticals (07 05 13*)	2,534	1,956	3,982	4,881
Sludges and filter cakes	6,057	3,834	3,663	3,006
Batteries (small, non-lead acid)	228	223	136[103]	46
Packaging (contaminated or containing residues)	746	664	867	777
Photographic chemical waste	650	432	221	284
Oil filters	1,092	741	739	654
Construction and demolition waste (hazardous)	137	12,892	9,137	3,236
Metal and heavy metal containing waste	71	69	181	83
Agricultural hazardous waste		72		
Absorbents, wiping cloths etc. (EWC 15 02 02*)	1,373	661	596	939
Fluorescent lamps	56	74	58	119
Pesticides, herbicides	71	56	30	47
Laboratory and general chemical waste	193	485	548	677
Salts and saltcake			2	1
Thermal treatment and combustion residues	428	59	89	1977
Medicines	3			
Municipal hazardous waste (other)			437	537
Polychlorinated biphenyls		1	29	8
Total	**157,202**	**150,397**	**143,179**	**149,037**

(Source: NTFSO survey)

[102] The reported tonnage for industrial hazardous waste (other) was incorrectly classified in National Waste Report 2010 and has been corrected here.
[103] The reported tonnage for batteries (small, non lead-acid) was incorrectly classified in National Waste Report 2010 and has been corrected here.

Many hazardous waste streams are collected, bulked and stored prior to export for treatment, while some undergo treatment in the State and then are exported for final treatment. A reported 28,270 t of hazardous waste was blended at EPA licensed hazardous waste treatment facilities in Ireland in 2011 prior to being exported as a waste for use as fuel in cement kilns and incineration abroad.

The tonnage of lead acid batteries exported increased by 4% in 2011 compared to 2010. Although the tonnage of batteries (small, non-lead acid) exported has decreased when compared to 2010 levels, the overall tonnage of batteries exported has increased by 28% when compared to levels in 2009 and previous years. 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 in September 2008.

Of the hazardous waste exported for treatment, 32% by weight are disposed and 68% recovered. Of the tonnage sent for disposal, 76% is sent for incineration without energy recovery (D10). Of the tonnage sent for recovery, 28% goes for metal recovery (R4) and 28% for use as a fuel (R1). See Table 39 for more detailed information.

Table 39: Disposal and recovery of reported export of hazardous waste, 2011

Disposal (D)	Exported (t)	Recovery (R) code[104]	Exported (t)
D1	2,801	R1	28,182
D1/D5	3,027	R1, R3	60
D10	35,569	R1, R3, R4	770
D12	6	R1, R3, R5	164
D14	24	R1, R4	1,897
D5	2,147	R1, R4, R5	283
D8	1,999	R1, R5	23
D8/D9	527	R1, R9	25
D9	966	R12	6,068
		R13	2,191
		R2	15,721
		R2, R3	4,025
		R3	3,651
		R3, R4	4,482
		R3, R5	54
		R4	28,590
		R4, R5	112
		R5	4,426
		R6	1,014
		R8	1
		R9	233
Sub-total hazardous waste exported for disposal	**47,065**	**Sub-total hazardous waste exported for recovery**	**101,972**
(Source: NTFSO survey)		**Total hazardous waste exported for treatment (t)**	**149,037**

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

12.4 Hazardous waste treatment at IPPC licensed facilities

Of the hazardous waste treated at IPPC licensed facilities (mainly pharmaceutical plants) in 2011, 51% was disposed and 49% was recovered (Figure 21).

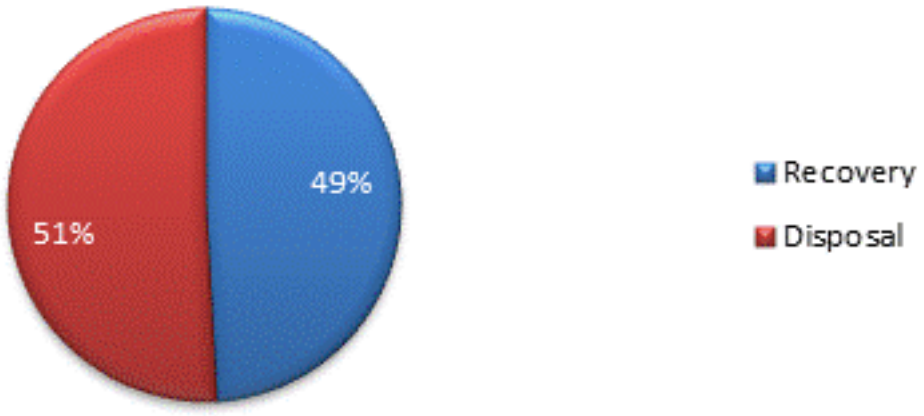


Figure 21: Proportion of disposal and recovery at IPPC-licensed facilities.

The quantity of hazardous wastes recovered or disposed on-site at IPPC-licensed facilities decreased by 12% compared to 2010. Hazardous waste treatment at the site of generation occurs in the main within the chemicals sector, but also in the minerals sector. The main activities are incineration without energy recovery of solvents or other industrial waste (D10), or solvent recovery (R2) or use of solvents as a fuel (R1). See Table 40 for more information.

Figure 22 and Table 41 provide information on the destination and fate of hazardous waste exported from Ireland in 2011 for treatment at authorised facilities abroad. Records on the authorised export of hazardous waste were obtained from the National TFS Office. Great Britain, Belgium, Germany and France received 90% of Irish hazardous waste exports in 2011.

Table 40: Treatment of hazardous waste on-site at IPPC-licensed facilities in 2011 (excluding contaminated soil)

Facility name	IPPC Reg No.	Waste type	Recovery/ Disposal code[105]	Quantity treated (t)
Arran Chemical Co Ltd	P0110-02	Solvents	R2	763
Astellas Ireland Co. Ltd	P0007-03	Solvents	D10	616
		Aqueous washing liquids and mother liquors (07__01*)	D10	1,400
Aughinish Alumina Ltd	P0035-04	Salts and salt cake	D1	20,079
BASF Ireland Limited	P0052-02	Other industrial hazardous waste	R1	4,720
Phillips 66 Bantry Bay Term.	P0419-01	Oil waste (mineral oil)	R9	180
Eli Lilly	P0009-03	Solvents	D10	2,944
		Solvents (halogenated where specified)	D10	68
Galmoy Mines Ltd	P0517-01	Oily sludges	R10	45
Irish Industrial Explosives Ltd	P0055-01	Other industrial hazardous waste	D10	2
Mallinckrodt Medical Imaging Ireland	P0050-02	Solvents	R2	6347
		Solvents	D8	306
		Solvents (halogenated where specified)	D8	<0.1
		Solvents (halogenated where specified)	D9	122
Merck Sharp & Dohme	P0011-04	Solvents	D8	1,061
			R2	1,820
Merck Millipore Ltd	P0571-02	Solvents	R2	1,380
Novartis Ringaskiddy Ltd	P0006-03	Other industrial hazardous waste	D10	<0.1
		Packaging (contaminated or containing residues)	D10	25
		Sludges and filter cakes	D10	0.2
		Solvents	D10	<0.1
			D8	284
			R1	1,756
			R2	4,102
		Absorbents, wiping cloths	D10	30
		Aqueous washing liquids and mother liquors (07__01*)	D10	452
		Solid wastes from MFSU of pharmaceuticals (07 05 13*)	D10	2
		Laboratory and general chemical waste	D10	13
Pfizer Ireland Pharmaceuticals	P0013-04	Solvents	R2	1,130
Pfizer Cork Ltd	P0136-04	Solvents	R2	2,724
		Solvents	R1	13
Roche Ireland Ltd	P0012-04	Solvents	R1	2,415
		Solvents (halogenated where specified)	R1	958
Schering-Plough (Ireland)	P0015-05	Solvents	R1	1151
Smithkline Beecham (Cork) Ltd	P0004-03	Solvents	D10	2,417
			R2	161
		Solvents (halogenated where specified)	D10	8
Swords Laboratories	P0014-04	Solvents	D8	1.3
			R2	580
		Solvents (halogenated where specified)	R2	224
Bristol Myers Squibb Cruiserath	P0552-02	Solvents	R2	1,213
		Solvents (halogenated where specified)	D10	4,639
			D8	2.5
			R2	154
Temmler Ireland Ltd	P0813-02	Solvents	R2	1,172
		Solid wastes from MFSU of pharmaceuticals (07 05 13*)	R3	294
(Source: IPPC PRTR and Annual Environmental Reports)			**Total**	**67,772**

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

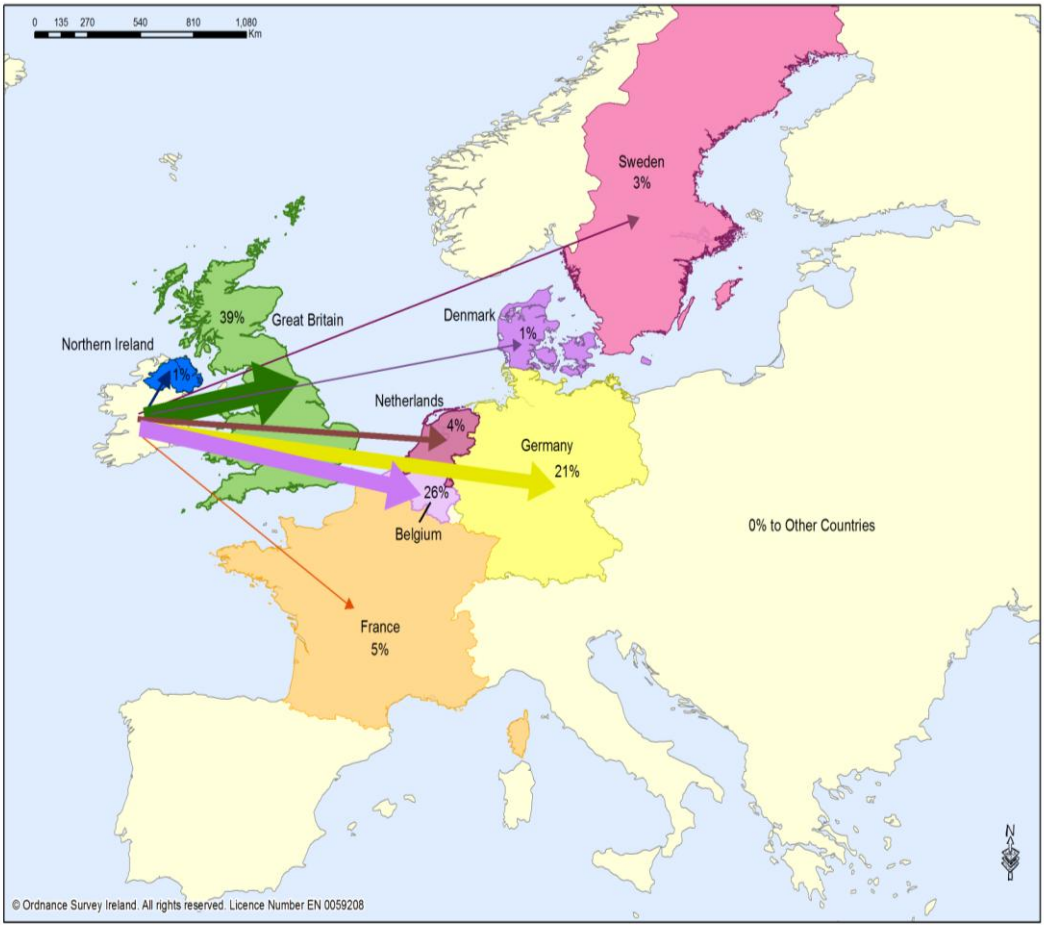


Figure 22: Destination of exported hazardous waste, 2011 (excluding contaminated soil)

Table 41: Destination and fate of notified hazardous waste exports (excluding contaminated soil), 2011

Destination	Disposal (t)[106]	Recovery (t)[106]	Total exports
Belgium	11,475	26,937	38,412
Germany	21,261	9,747	31,008
Denmark	1,748		1,748
Finland	457		457
France	882	6,217	7,099
Italy		1	1
Netherlands	684	6,064	6,747
Poland		298	298
UK	10,560	48,771	59,330
USA		73	73
Sweden		3,865	3,865
Overall totals	**47,065**	**101,972**	**149,037**

(Source: NTFSO survey)

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

12.5 Hazardous waste imported for treatment

In 2011, 2,622 t of oil-related waste was imported from the UK for recovery at commercial hazardous waste treatment facilities in the State (Table 42).

Table 42: Origin and fate of notified hazardous waste imports, 2011

Country of export	Waste description	Treatment operation	Total imports (t)
UK	Waste oils/water, hydrocarbons/water mixtures, emulsions for composition.	Oil recovery (R9)	318
	Waste oil		1,096
	Waste oil-mineral bases chlorinated hydraulic oils, mineral based chlorinated engine, gear and lubricating oils.		1,208
(Source: NTFSO survey)			**2,622**

12.6 Contaminated soil

Table 43 outlines trends in the management of contaminated soil since 2006. The data do not reflect any contaminated soil that was treated *in situ* at its point of generation. There was a 13% increase in the treatment of contaminated soil off-site in Ireland in 2011 compared to 2010. All reported treatment took place at Enva Ireland Ltd's Portlaoise facility (W0184-01). All exports of contaminated soils in 2011 were to Germany, accounting for 59% of the total managed. There was an increase in the reported export of contaminated soil from 2,590 t in 2010 to 10,203 t in 2011, 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 43: Reported off-site management of contaminated soil, 2006-2011

	2006	2007	2008	2009	2010	2011
Off-site in Ireland (t)	**36,872 (R[107])**	**44,221(R)**	**2 (D) 43,531 (R)**	**12,428 (R)**	**6,260 (R)**	**7,094 (R)**
Exported (total) (t)	**370,032**	**143,906**	**449,574**	**476**	**2,590**	**10,203**
Germany	341,158 (D)	126,859 (D)	285,028 (D) 135,980 (R)	7 (D)	2,590 (D)	10,203 (D)
	28,570 (R)	14,919 (R)				
Netherlands	305 (R)	2,128 (R)	12,655 (D)	469 (R)		
			15,911 (R)			
Total reported (t)	**406,904**	**188,127**	**493,107**	**12,904**	**8,850**	**17,297**

(Source: Hazardous waste treatment survey, NTFSO survey)

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

12.7 National Hazardous Waste Management Plan

The EPA is currently reviewing the National Hazardous Waste Management Plan (NHWMP) for the period 2013-2017 in accordance with Section 26 of the Waste Management Acts 1996 to 2012. The first NHWMP was published in 2001 and was replaced by a second Plan in 2008.

The proposed NHWMP will set out the priority actions that should be undertaken within the period of the Plan in relation to the prevention of hazardous waste; improved collection rates for certain categories of hazardous waste; the steps that are required to improve Ireland's self-sufficiency in hazardous waste management and the management of legacy hazardous wastes contained in closed landfills. All of the NHWMP recommendations are designed to reduce the environmental impact of hazardous waste.

APPENDICES

APPENDIX A – INDICATORS

Indicator	2006	2007	2008	2009	2010	2011
Municipal waste						
Municipal waste managed (t)	3,100,310	3,174,565	3,103,820	2,824,977	2,580,435	2,546,577
Municipal waste managed/person (t)	0.730	0.730	0.702	0.634	0.563	0.555
Municipal waste generated (t)[108]	3,384,606	3,397,683	3,224,279	2,952,977	2,846,115	2,823,242
Municipal waste generated/person (t)[109]	0.800	0.780	0.729	0.662	0.621	0.615
Disposal of managed municipal waste to landfill (t)	1,980,618	2,014,797	1,938,712	1,723,705	1,495,565	1,344,008
Disposal rate for managed municipal waste	64%	64%	63%	61%	58%	53%
Recovery of municipal waste (t)	1,119,692	1,159,767	1,165,108	1,101,272	1,084,870	1,202,569
Recovery rate for municipal waste	36%	37%	38%	39%	42%	47%
Number landfills accepting municipal waste for disposal	29	29	31	28	28	21
Number of bring banks	1,919	1,960	1,989	1,962	1,922	1,891
Number of civic amenity sites	86	90	96	107	107	113
Household waste						
Household waste managed (t)	1,773,242	1,625,490	1,556,879	1,498,469	1,420,706	1,406,576
Household waste managed/person (t)	0.420	0.370	0.352	0.336	0.310	0.307
Household waste generated (t)	1,978,716	1,761,167	1,677,338	1,626,469	1,686,387	1,683,241
Household waste generated/person (t)	0.470	0.410	0.379	0.365	0.368	0.367
Disposal of household waste to landfill (t)	1,379,246	1,200,980	1,155,567	1,056,267	843,842	750,066
Residual household waste disposal/person (landfill) (t)	-	0.277	0.261	0.237	0.184	0.163
Disposal rate for household waste	78%	74%	74%	71%	59%	53%
Recovery of household waste (t)	393,995	424,510	401,312	442,202	576,864	656,510
Recovery rate for household waste	22%	26%	26%	30%	41%	47%
Commercial waste						
Commercial waste managed (t)	1,327,068	1,549,075	1,477,395	1,299,807	1,141,015	1,114,829
Commercial waste managed/person (t)	0.310	0.360	0.330	0.291	0.249	0.243
Disposal of commercial waste to landfill (t)	601,372	813,817	758,176	640,737	633,010	568,770
Disposal rate for commercial waste	45%	53%	51%	49%	55%	51%
Recovery of commercial waste (t)	725,697	735,257	719,219	659,070	508,005	546,059
Recovery rate for commercial waste	55%	48%	49%	51%	45%	49%
Packaging waste						
Best estimate of total quantity managed (t)	1,028,472	1,055,952	1,026,759	972,430	863,714	863,597
Packaging waste managed/person (t)	0.240	0.240	0.232	0.218	0.189	0.188
Best estimate of packaging waste recovered (t)	589,519	671,630	664,043	679,535	636,933	682,280
Packaging waste recovered/person (t)	0.140	0.150	0.150	0.150	0.139	0.149
National recovery rate	57%	64%	65%	70%	74%	79%
Other waste stream indicators						
WEEE recovery (%)	unknown	82%	84%	85%	84%	85%
Hazardous waste recovered (%)	47%	60%	64%	70%	68%	72%

[108] Generated municipal solid waste includes estimated uncollected household waste.
[109] Per person calculations based on CSO census data (2011 census – population 4,588,252).

APPENDIX B – HOUSEHOLD WASTE COLLECTED AND BROUGHT

Local authority[110]	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[111] (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	87,456	32,548	16,675	30	11,370	3,277	0	4,129	**155,486**
Dun Laoghaire-Rathdown	31,253	19,705	2,408	91	2,015	8,973	0	1,263	**65,707**
Fingal	45,702	19,651	18,117	56	4,631	7,480	0	1,027	**96,665**
South Dublin	40,438	20,780	9,445	60	5,028	14,465	0	1,241	**91,456**
Meath	39,413	8,626	144	0	2,015	3,818	0	1,295	**55,311**
Louth	23,000	6,062	2,435	0	2,095	9,846	1,640	236	**45,313**
Kildare	52,484	14,111	4,167	28	3,627	3,050	0	2,640	**80,108**
Wicklow[112]	23,890	5,003	24	0	2,183	4,411	81	5,900	**41,491**
Laois	12,877	2,851	546	31	1,134	1,701	4,210	486	**23,836**
Offaly	9,006	3,460	456	0	1,057	1,574	0	402	**15,955**
Longford	6,329	2,008	326	0	554	1,412	0	479	**11,107**
Westmeath	16,029	4,084	12	0	1,475	1,984	0	624	**24,208**
Eastern and Midlands Region	387,877	138,889	54,755	296	37,184	61,991	5,931	19,722	**706,644**
Cavan	11,166	2,361	36	0	2,233	3,193	0	333	**19,322**
Monaghan	9,706	3,242	411	0	1,087	802	0	389	**15,637**
Galway County	32,023	13,543	1,962	0	3,088	5,968	0	1,900	**58,484**
Galway City	10,084	4,680	5,004	278	1,908	1,227	0	100	**23,280**
Leitrim	3,158	1,538	0	0	694	566	170	560	**6,685**
Mayo	25,167	7,294	865	0	2,451	5,449	160	1,543	**42,929**

[110] Divisions based on proposed three Region Waste Planning structure (refer Appendix 9 of Government Policy Paper *Putting People First* - www.environ.ie/en/PublicationsDocuments/FileDownLoad,31309,en.pdf).
[111] Includes WEEE collected by compliance schemes at civic amenity sites.
[112] Wicklow's kerbside tonnage up on 2010 data, but four collectors had failed to submit their 2010 data.

Local authority[110]	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[111] (t)	Household waste delivered directly to landfill face by householders (t)	Estimate of home composting (t)	Total collected and brought household waste (t)
Donegal	13,755	3,947	0	0	2,592	1,218	161	1,228	**22,900**
Roscommon	10,249	2,604	514	0	866	3,364	0	211	**17,808**
Sligo	11,664	2,000	72	0	1,386	1,312	0	968	**17,403**
Connaught Ulster Region	126,972	41,209	8,864	278	16,306	23,099	491	7,232	**224,448**
Clare	14,109	5,853	1,069	149	1,530	6,931	0	1,054	**30,695**
Kerry	17,642	6,108	549	21	2,820	9,352	515	1,490	**38,495**
Limerick County	16,812	7,347	1,309	97	1,899	6,217	0	1,040	**34,721**
Limerick City	11,789	4,286	605	6	1,175	522	0	500	**18,883**
Cork City	29,332	11,050	0	1,462	1,677	2,420	0	350	**46,290**
Cork County	56,088	22,184	1,354	1,827	6,543	16,442	0	1,146	**105,583**
Carlow	12,948	2,269	376	30	1,176	1,565	2,754	318	**21,435**
Kilkenny	12,382	3,635	154	0	2,054	3,268	0	1,155	**22,648**
South Tipperary	15,016	5,404	523	52	1,720	2,175	237	770	**25,897**
North Tipperary	12,766	4,976	442	0	1,133	1,754	68	308	**21,447**
Waterford County	11,259	2,889	2,194	23	1,324	635	0	360	**18,684**
Waterford City	10,064	3,133	3,246	0	1,916	1,488	0	360	**20,206**
Wexford County	30,259	10,152	2,055	126	3,696	3,376	0	1,741	**51,405**
Southern Region	250,464	89,286	13,876	3,793	28,663	56,145	3,574	10,592	**456,389**
Household WEEE collected by compliance schemes at retail premises, one-off collection days									**19,096**
Overall total	**765,312**	**269,382**	**77,494**	**4,367**	**82,149**	**141,235**	**9,996**	**37,545**	**1,406,576**

APPENDIX C

HOUSEHOLD WASTE COLLECTED AT BRING BANKS

Local authority area	Paper & cardboard (t)	Glass (t)	Aluminium cans (t)	Steel cans (t)	Plastic (t)	Composite packaging (t)	Other [113] (t)	Total (t)
Carlow	365	780	31	0	0	0	0	**1,176**
Cavan	167	1,242	58	39	720	8	0	**2,233**
Clare	0	1,286	44	0	183	0	16	**1,530**
Cork City	0	1,660	17	0	0	0	0	**1,677**
Cork County	198	5,939	134	235	24	0	13	**6,543**
Donegal	0	2,405	60	91	0	0	36	**2,592**
Dublin City	1,576	8,916	28	1	0	0	849	**11,370**
Dún Laoghaire-Rathdown	0	2,000	15	0	0	0	0	**2,015**
Fingal	0	4,613	18	0	0	0	0	**4,631**
Galway City	0	1,908	0	0	0	0	0	**1,908**
Galway County	0	2,991	58	39	0	0	0	**3,088**
Kerry	0	2,433	87	201	100	0	0	**2,820**
Kildare	0	3,597	30	0	0	0	0	**3,627**
Kilkenny	26	1,700	53	14	5	0	254	**2,054**
Laois	0	1,099	14	22	0	0	0	**1,134**
Leitrim	0	656	37	0	0	0	0	**694**
Limerick City	0	1,051	38	0	87	0	0	**1,175**
Limerick County	0	1,718	29	80	0	0	72	**1,899**
Longford	0	535	7	10	0	0	2	**554**
Louth	0	1,725	71	0	299	0	0	**2,095**
Mayo	0	2,352	100	0	0	0	0	**2,451**
Meath	0	1,994	22	0	0	0	0	**2,015**
Monaghan	0	1,047	41	0	0	0	0	**1,087**
North Tipperary	0	1,086	23	0	0	0	23	**1,133**
Offaly	0	991	23	42	0	0	0	**1,057**
Roscommon	0	822	43	0	0	0	1	**866**
Sligo	0	1,332	54	0	0	0	0	**1,386**
South Dublin	0	4,863	16	0	0	0	149	**5,028**
South Tipperary	68	1,600	52	0	0	0	0	**1,720**
Waterford County	0	1,324	0	0	0	0	0	**1,324**
Waterford City	0	1,885	30	0	0	0	0	**1,916**
Westmeath	0	1,460	15	0	0	0	0	**1,475**
Wexford	545	3,067	83	0	0	0	0	**3,696**
Wicklow	0	2,085	46	12	0	0	39	**2,183**
Total	**2,946**	**74,161**	**1,378**	**785**	**1,417**	**8**	**1,454**	**82,149**

[113] Other = wood, green waste (e.g. Christmas trees), household hazardous waste collected at temporary bring centres.

APPENDIX D – HOUSEHOLD WASTE 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 (eg tetrapak) (t)	C&D (DIY) (t)	Wood[114] (t)	Batteries[115] (t)	Waste mineral oils & filters (t)	Waste cooking or veg. oils (t)	Paint & varnish (t)	WEEE[116] (t)	Bulky waste (t)	Household hazardous waste (t)	Other[117] (t)	Total (t)
Carlow	0	361	0	209	136	166	68	6	20	323	13	9.5	1.7	11.3	231	0	0.0	7.7	**1,565**
Cavan	1419	265	0	374	140	138	205	9	129	204	3	1.6	0.8	3.0	245	57	0.0	0.2	**3,193**
Clare	2035	730	0	646	1010	504	340	11	160	564	17	32.2	0.5	35.2	547	300	0.0	0.0	**6,931**
Cork City	992	216	0	176	33	86	34	0	0	151	4	7.5	0.0	18.2	701	0	0.9	0.0	**2,420**
Cork County	3931	1464	366	1711	946	1013	233	0	1800	1420	39	31.3	17.4	124.1	1691	1652	0.5	1.7	**16,442**
Donegal	0	2	0	234	224	112	100	1	0	0	0	5.8	2.0	20.5	325	191	1.6	0.0	**1,218**
Dublin City	0	108	157	56	184	62	23	0	457	186	3	1.8	0.0	311.8	627	1096	0.0	4.1	**3,277**
Dun Laoghaire-Rathdown	280	4001	0	767	446	310	147	15	332	543	23	14.2	4.1	130.1	656	1303	0.0	1.6	**8,973**
Fingal	0	1084	0	431	540	352	86	6	1058	969	26	26.2	3.9	187.2	1242	1464	2.7	1.4	**7,480**
Galway County	1914	385	218	498	280	1183	158	0	713	149	18	16.0	0.0	78.0	329	0	6.1	23.3	**5,968**
Galway City	0	0	0	0	16	34	3	0	0	316	4	10.1	0.0	40.2	804	0	0.0	0.0	**1,227**
Kerry	6898	366	238	722	218	251	116	0	9	24	2	11.5	0.7	2.6	490	0	0.0	1.4	**9,352**
Kildare	2233	16	0	273	58	157	33	0	12	0	5	3.4	0.0	0.0	58	89	73.9	39.0	**3,050**
Kilkenny	1698	0	0	298	87	69	69	9	0	38	0	3.8	0.5	23.0	177	795	1.9	0.0	**3,268**
Laois	0	194	0	468	202	208	220	2	4	31	1	12.2	0.3	8.5	279	0	51.2	17.7	**1,701**
Leitrim	0	15	0	88	28	33	18	3	0	0	0	1.4	0.0	33.2	74	272	0.0	0.6	**566**
Limerick County	2062	483	0	534	209	329	247	5	933	524	12	6.7	8.6	121.3	570	135	0.0	36.5	**6,217**
Limerick City	0	0	0	121	0	0	0	0	0	0	13	2.2	1.8	42.3	308	0	0.0	34.4	**522**
Longford	342	203	110	147	35	73	78	4	26	80	3	0.0	0.0	3.7	172	135	0.0	0.0	**1,412**
Louth	895	2702	0	1966	595	454	598	0	136	1725	16	5.8	3.5	3.6	746	0	0.0		**9,846**
Mayo	3242	37	0	635	208	301	126	12	33	263	16	15.2	3.3	29.8	488	0	24.5	14.8	**5,449**
Meath	217	729	132	610	365	250	153	16	126	320	14	4.8	2.7	38.6	725	101	9.7	4.4	**3,818**
Monaghan	221	0	0	0	86	47	0	0	226	0	8	5.8	0.8	1.8	206	0	0.0	0.6	**802**
North Tipperary	362	2	0	416	206	95	94	5	0	133	7	10.6	0.0	0.0	342	79	0.0	0.6	**1,754**
Offaly	187	301	0	326	100	142	84	11	19	199	0	2.6	0.0	51.0	105	42	0.0	4.9	**1,574**
Roscommon	1672	2	95	615	145	185	86	0	101	149	5	3.8	0.6	28.9	275	0	0.0	1.3	**3,364**
Sligo	0	509	0	221	81	63	47	6	51	43	2	0.0	3.0	0.0	277	0	10.7	0.0	**1,312**
South Dublin	3582	1941	0	259	99	345	11	0	798	66	14	43.6	0.9	33.7	787	6483	0.0		**14,465**
South Tipperary	805	0	111	145	94	164	32	0	143	265	1	2.9	0.0	1.8	318	70	0.3	23.0	**2,175**
Waterford County	115	52	92	0	39	21	0	0	0	44	0	2.0	1.3	2.9	197	67	0.0	1.2	**635**
Waterford City	310	826	0	24	16	11	0	0	0	0	1	2.5	0.5	7.0	289	0	0.0	1.6	**1,488**
Westmeath	0	517	0	437	132	140	83	15	0	255	17	7.2	1.0	0.0	349	32	0.0	0.0	**1,984**
Wexford	2082	0	15	358	163	241	85	8	0		10	14.0	1.6	0.0	389	0	9.5	0.0	**3,376**
Wicklow	108	0	0	1735	866	279	417	60	0	0	4	9.9	5.0	54.3	841	0	7.7	23.7	**4,411**
Total (t)	**37,601**	**17,511**	**1,534**	**15,502**	**7,986**	**7,817**	**3,996**	**203**	**7,286**	**8,984**	**304**	**328**	**67**	**1,448**	**15,860**	**14,362**	**201**	**246**	**141,235**

[114] 75% of which (in t) is home improvement/DIY source.
[115] 80% of which (in t) are lead acid.
[116] Compliance scheme data for household WEEE collected at civic amenity sites.
[117] 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 2010 (t)	Total waste accepted in 2011 (t)	DISPOSAL[118]					RECOVERY		
						Household waste (t)	Commercial waste[119] (t)	Industrial waste (t)	C & D waste (t)	Municipal sweepings & parks (t)	C & D waste (t)	Organic waste[120] (t)	Other wastes[121] (t)
1	Carlow County Council	Powerstown Landfill	W0025-03	13,663	10,146	3,508	534	1,997	0	3,370	737	0	0
2	Cavan County Council	Corranure Landfill	W0077-04	12,231	154	0	0	0	0	0	154	0	0
3	Clare County Council	Central Waste Management Facility	W0109-02	28,826	36,346	15,820	13,138	928	0	808	4,632	0	1,021
4	Cork County Council	Youghal Landfill	W0068-03	58,965	25,911	21,071	678	192	0	2,881	1,089	0	0
5	Cork County Council	Derryconnell Landfill Site	W0089-02	4,225	0	0	0	0	0	0	0	0	0
6	Donegal County Council	Ballynacarrick Landfill	W0024-04	31,565	16,170	5,981	8,764	1,251	0	174	0	0	0
7	Fingal County Council	Balleally Landfill	W0009-03	97,726	89,503	31,222	14,829	7,351	0	975	35,126	0	0
8	Kerry County Council	North Kerry Landfill	W0001-04	21,276	16,504	13,825	1,551	0	0	892	0	0	236
9	Kilkenny County Council	Dunmore Landfill	W0030-02	1,470	0	0	0	0	0	0	0	0	0
10	Laois County Council	Kyletalesha Landfill	W0026-03	58,289	43,720	22,531	13,889	39	3	324	6,895	40	0

[118] Fly-tipped waste accepted for disposal in 2011=13,700 t (compared to 14,958 t in 2010 and 16,573 t in 2009). This tonnage is reported within the household and commercial waste columns.
[119] Includes non-process industrial waste.
[120] 'Organic' category is made up of compost, bio-stabilised waste.
[121] 'Other' category includes timber, wood chip recovered at landfill sites.

	Local authority / Operator	Facility name	Waste licence Reg No.	Total waste accepted in 2010 (t)	Total waste accepted in 2011 (t)	DISPOSAL[118]					RECOVERY		
						Household waste (t)	Commercial waste[119] (t)	Industrial waste (t)	C & D waste (t)	Municipal sweepings & parks (t)	C & D waste (t)	Organic waste[120] (t)	Other wastes[121] (t)
11	Limerick County Council	Gortadroma	W0017-04	117,138	135,487	82,805	46,354	368	0	467	5,493	0	0
12	Louth County Council	Whiteriver	W0060-03	41,664	120,381	58,898	11,075	2,700	377	2,569	43,026	0	1,737
13	Mayo County Council	Derrinumera Landfill	W0021-02	35,244	33,859	27,322	4,454	5	0	1,268	168	0	643
14	Mayo County Council	Rathroeen Landfill	W0067-02	649	1,354	0	0	931	0	0	39	0	384
15	Monaghan County Council	Scotch Corner Landfill	W0020-02	33,789	27,430	15,815	10,323	528	0	702	0	62	0
16	North Tipperary County Council	Ballaghveny Landfill	W0078-03	17,044	9,770	4,223	2,676	461	2,331	79	0	0	0
17	Offaly County Council	Derryclure Landfill	W0029-04	51,332	110,123	87,154	3,224	205	4,666	0	14,874	0	0
18	Roscommon County Council	Ballaghaderreen Landfill	W0059-03	48,779	16,800	0	0	0	0	0	16,800	0	0
19	South Dublin County Council	Arthurstown Landfill	W0004-04	255,379	33,438	0	0	0	0	0	33,438	0	0
20	South Tipperary County Council	Donohill Landfill	W0074-03	15,271	17,281	7,717	2,759	223	0	1,244	467	0	4,871
21	Westmeath County Council	Ballydonagh Landfill	W0028-03	23,993	0	0	0	0	0	0	0	0	0
22	Wexford County Council	Holmestown Landfill	W0191-02	33,782	24,120	21,225	1,383	0	0	1,313	84	0	116
23	Wicklow County Council	Rampere Landfill	W0066-03	31,630	38,825	17,597	9,531	283	0	514	10,900	0	0

	Local authority / Operator	Facility name	Waste licence Reg No.	Total waste accepted in 2010 (t)	Total waste accepted in 2011 (t)	DISPOSAL[118]					RECOVERY		
						Household waste (t)	Commercial waste[119] (t)	Industrial waste (t)	C & D waste (t)	Municipal sweepings & parks (t)	C & D waste (t)	Organic waste[120] (t)	Other wastes[121] (t)
24	Bord Na Mona	Clonbullogue Ash Repository	W0049-02	32,157	34,663	0	0	34,663	0	0	0	0	0
25	Bord Na Mona plc	Drehid Waste Management Facility	W0201-03	418,243	415,583	142,157	184,331	1,146	320	859	72,687	7,968	17,315
26	Bord Na Mona	Srahmore	W0199-02	0	16,185	0	0	0	0	0	16,185	0	0
27	Greenstar Holdings Ltd.	Knockharley Landfill	W0146-02	198,365	126,128	50,928	35,530	508	9	2,603	34,932	0	1,618
28	Greenstar Holdings Ltd.	East Galway Residual Landfill	W0178-02	108,544	110,019	50,796	44,818	4,134	0	2,631	1,585	0	6,055
29	Greenstar Holdings Ltd.	Ballynagran Residual Landfill	W0165-02	169,475	212,192	69,473	77,463	5,465	0	110	54,409	0	5,273
30	KTK Landfill Ltd.	KTK Landfill Limited	W0081-04	57,654	258,751	0	81,466	27,945	0	1,389	134,750	0	13,202
31	Murphy Environmental Hollywood Ltd	Murphy Environmental Hollywood Ltd	W0129-02	30,626	27,378	0	0	2,180	21,395	0	3,804	0	0
32	Murphy Environmental Hollywood Ltd	Murphy Concrete Manufacturing Ltd	W0151-01	151,477	60,427	0	0	0	0	0	60,427	0	0
			Total		**2,068,647**	750,066	568,770	93,502	29,101	25,172	552,699	8,070	52,468
								Total Disposal[122] [123]		1,466,610	**Total Recovery**		613,237

Landfills that accepted waste for disposal in 2010 but not in 2011:	Corranure Landfill (W0077-04), Derryconnell Landfill (W0089-02), Dunmore Landfill (W0030-02), Ballaghaderreen Landfill (W0059-03) Arthurstown Landfill (W0004-04) Ballydonagh Landfill (W0028-03) Kerdiffstown Landfill (W0047-02)

[122] Total municipal waste disposed = 1,344,008 t (household + commercial + municipal sweepings and parks).
[123] In addition, operators reported exporting 211 t of municipal waste abroad for disposal in 2011 (e.g. paints sent for 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 2011
1	Wicklow County Council	Ballymurtagh	W0011-02	Civic amenity site
2	Cork City Council	Kinsale Road	W0012-03	Civic amenity site & composting facility
3	Galway City Council	Carrowbrowne	W0013-01	Composting facility
4	Kildare County Council	Silliot Hill	W0014-01	Civic amenity site & waste transfer station
5	Dun Laoghaire Rathdown County Council	Ballyogan	W0015-01	Civic amenity site
6	Waterford County Council	Kilbarry	W0018-01	Civic amenity site
7	Cork County Council	East Cork	W0022-02	Civic amenity site
8	Cork County Council	Raffeen	W0023-02	Civic amenity site
9	Ballinasloe Town Council	Pollboy	W0027-02	Civic amenity site
10	Westmeath County Council	Ballydonagh	W0028-03	Civic amenity site
11	Kilkenny County Council	Dunmore	W0030-02	Civic amenity site
12	Waterford County Council	Dungarvan	W0032-02	Civic amenity site & waste transfer station
13	Drogheda Borough Council	Drogheda	W0033-01	Civic amenity site
14	Dundalk Town Council	Dundalk	W0034-02	Civic amenity site
15	Cavan County Council	Corranure	W0077-04	Civic amenity site
16	Roscommon County Council	Ballaghaderreen	W0059-02	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)[124] on waste

Code	Disposal operations	Code	Recovery operations
D1	Deposit into or onto land (eg landfill, etc.)	R1	Use principally as a fuel or other means to generate energy
D2	Land Treatment (eg biodegradation of liquid or sludgy discards in soils etc.)	R2	Solvent reclamation/regeneration
D3	Deep injection (eg 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 (eg placement of liquid or sludgy discards into pits, ponds or lagoons etc.)	R4	Recycling / reclamation of metals and metal compounds
D5	Specially engineered landfill (eg 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 (eg 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 (eg 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)		

[124] 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)[125]	Mixed dry recyclables (green bin)	Mixed organics (brown bin)	Total	Biodegradability factor
BMW Content	61.6%[126]	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/pubs/reports/waste/wastecharacterisation/)

[125] This represents an average or composite of the residual bin from either a 1-bin, 2-bin or 3-bin collection service.
[126] 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, 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 www.epa.ie/pubs/advice/waste/municipalwaste/).

APPENDIX I – COMPOSTED WASTE

Table I-1: Composted waste in 2011[127]

EWC chapter sub-heading	Description	Tonnes
02 01	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing	8,668
02 02	Wastes from the preparation and processing of meat, fish and other foods of animal origin	5,040
02 03	Wastes from fruit, vegetables, cereal etc. preparation and processing	1,981
02 05	Wastes from the dairy products industry	16,488
02 06	Wastes from the baking and confectionery industry	242
02 07	Wastes from the production of alcoholic and non-alcoholic beverages (except, coffee, tea and cocoa)	30,405
03 01	Wastes from wood processing and the production of panels and furniture	5,813
03 03	Wastes from pulp, paper and cardboard production and processing	18
04 02	Wastes from the textile industry	201
06 13	Wastes from inorganic chemical processes not otherwise specified	10
07 01	Wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals	1,031
07 05	Wastes from the MFSU of pharmaceuticals	4,351
07 06	Wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics	390
15 01	Packaging (including separately collected municipal packaging wastes)	7,815
17 08	Gypsum-based construction material	181
19 08	Wastes from waste water treatment plants not otherwise specified	62,091
19 09	Wastes from the preparation of water intended for human consumption or water for industrial use	478
19 12	Wastes from the mechanical treatment of waste	31,797
20 01	Municipal wastes (separately collected fractions) except 15 01	89,146
20 02	Garden and parks wastes (including cemetery waste)	38,993
20 03	Other municipal wastes	509
TOTAL		**305,648**

[127] EPA surveyed 26 composter/anaerobic digestion facilities for 2011 data. It was not a complete census of such facilities. Includes wastes arising in Ireland and imported for treatment.