

Municipal Waste Management in Ireland



Prepared by David Watson
ETC/SCP

February 2013

EEA project manager Almut Reichel

Author affiliation

David Watson, Copenhagen Resource Institute, <http://www.cri.dk/>

Context

The Topic Centre has prepared this working paper for the European Environment Agency (EEA) under its 2012 work programme as a contribution to the EEA's work on waste implementation.

Disclaimer

This **ETC/SCP working paper** has been subjected to European Environment Agency (EEA) member country review. Please note that the contents of the working paper do not necessarily reflect the views of the EEA.

Contents

| | |
|--|-----------|
| Highlights | 4 |
| 1 Introduction | 5 |
| 1.1 Objective | 5 |
| 2 Ireland’s MSW management performance | 5 |
| 2.1 MSW Indicators | 6 |
| 2.1.1 The recycling of MSW from 2001 to 2010 | 7 |
| 2.1.2 The yearly increase rate of recycling of MSW | 8 |
| 2.1.3 Landfilling of biodegradable municipal waste | 10 |
| 2.1.4 Regional differences in MSW recycling from 2001 to 2010 | 12 |
| 2.1.5 The relation between landfill tax level and recycling level of MSW | 12 |
| 2.1.6 Environmental benefits of better MSW management | 14 |
| 2.2 Uncertainties in the reporting | 15 |
| 2.3 Important initiatives taken to improve MSW management | 17 |
| 2.4 Future possible trends..... | 20 |
| References | 22 |

Highlights

- The majority of MSW generated in Ireland continues to end in landfill. However, the landfilled share of MSW reduced significantly from 77 % in 2001 to 53 % in 2010. Recycling (material and organic) of MSW increased dramatically over the same period, peaking in volume in 2007.
- A dip in recycling volumes followed in 2008, caused by a reduction in MSW generation and in demand for recyclates caused by the economic crisis.
- Ireland met its 2010 Landfill Directive target with a reasonable margin. A reduction in MSW generation resulting from the economic crisis was a key driver. Sharp increases in the landfill tax levy after 2007 and new obligations on commercial producers of food waste have also had an impact.
- The 2013 and 2016 Landfill Directive targets are at risk of not being met without considerable policy effort.
- The Landfill Levy due to increase to EUR 75 per tonne by 2013 will be a key element in meeting this challenge as will coming regulations on household food waste. Further development of MBT or incineration capacity in Ireland is needed to make use of the biodegradable component of residual wastes.
- Lack of regulation and control of the waste collection market in Ireland partially undermines the potential for Ireland to meet policy objectives. A tightening and stronger enforcement of waste collection permits has recently been promised by the Irish Government.
- Ireland has already met its 2020 50 % recycling target for MSW-related waste from the Waste Framework Directive: in 2010 53 % of household paper, metal, plastic and glass waste was prepared for reuse and recycling.
- Ireland's material recycling rates are currently highly influenced by the global market for recyclables.

1 Introduction

1.1 Objective

Based on historical MSW data for Ireland and EU targets linked to MSW the analysis undertaken includes:

- The historical performance on MSW management based on a set of indicators,
- Uncertainties that might explain differences between the countries' performance which are more linked to differences of what the reporting includes than differences in management performance,
- Relation of the indicators to the most important initiatives taken to improve MSW management in the country, and
- Assessment of the future possible trends and achieving of the future EU targets on MSW by 2020.

2 Ireland's MSW management performance

The definition of Municipal Waste in Ireland is broad, and includes wastes from households and cleansing activities (street and parks cleaning), as well as non-hazardous waste from commercial and services sector (shops, offices, etc) and non-process industrial wastes. These materials are similar in character and managed in a similar fashion. It does not include municipal waste-water treatment sludges. MSW management performance is thus influenced by many factors.

The last decade has seen significant changes in how waste is managed in Ireland. The regulatory regime imposed on the waste industry during this period has encouraged Ireland to move from a position of almost total reliance on landfill for managing waste to a significant recovery of recyclable materials.

It is recognised that waste planning on a national level is desirable and EU legislation continues to be a significant driver of waste policy (Waste Framework Directive, Landfill Directive, producer responsibility initiatives, etc).

Waste management policy at the national level is detailed in a set of three policy documents produced:

- Changing Our Ways, 1998
- Delivering Change – Preventing And Recycling Waste, 2002
- Waste Management - Taking Stock And Moving Forward, 2004
- A Resource Opportunity – Waste Management Policy in Ireland, 2012

The policy set out in these key documents is implemented through legal instruments (the Waste Management Acts 1996 to 2012, and a wide range of associated legal texts dealing with such matters as producer responsibility initiatives (PRI's), taxes, litter, technical standards, incineration, etc.) governing the management of waste and outlining the responsibilities of waste generators and waste management organisations.

A national waste management plan though proposed has never been adopted. Rather waste management plans are developed at the regional level in Ireland. A total of 10 local and regional waste management plans have been prepared covering all 34 local authority areas (ETC/SCP, 2009). However, the current programme of reform of local government structures will reduce the number of

regional authorities, and subsequent waste management plans, to a maximum of three (DECLG, 2012a).

Ireland is well advanced concerning achievements of its EU recovery/recycling obligations in relation to a range of EU directives (see Table 1A, of EPA 2012a). With respect to municipal waste Ireland had also already exceeded the 2020 50 % recycling target for wastes in MSW¹ required by the Waste Framework Directive. Ireland also achieved the 2010 landfill diversion target from the Landfill Directive with a comfortable margin. The 2013 and 2020 landfill targets may present more of a challenge. These targets are discussed in more detail later in the report.

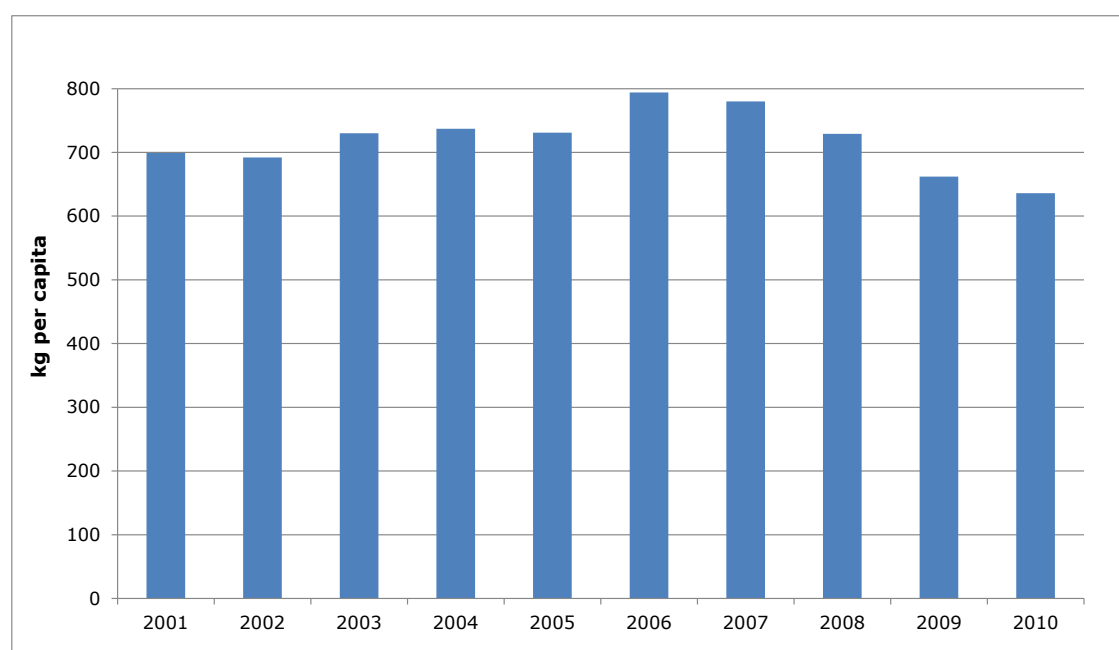
2.1 MSW Indicators

Figure 2.0 shows the development in MSW per capita in Ireland between 2001 and 2010. Generation per capita peaked in 2006 at 794 kg/capita. By 2010 it had reduced by 20 % to 636 kg/capita. This is likely to be a result of the economic recession following the financial crisis beginning in 2007.

The majority of MSW generated in Ireland continues to end in landfill. However, the share of MSW sent to landfill reduced significantly during the first decade of the millennium falling from 77 % in 2001 to 53 % in 2010. Recycling (material and organic) of MSW increased dramatically over the same period, while incineration only began to make noticeable inroads after 2007. By 2010, the share of incineration had caught up with organic recycling at 3.8 % of total MSW treated.

Developments in management of MSW are shown in more detail in the following indicators and analysis.

Figure 2.0 MSW Generation per capita in Ireland



Source: Eurostat, 2012

¹ Commission Decision 2011/753/EU allows the 50 % MSW recycling target required by the Waste Framework Directive to be interpreted by Member States using four alternative accounting methods. Ireland has chosen the first accounting method: that 50 % by weight of paper, metal, plastic and glass wastes from households be prepared for reuse and recycling.

2.1.1 The recycling of MSW from 2001 to 2010

Figure 2.1 shows the development of recycling of MSW in Ireland: both individual trends in material recycling and organic recycling (compost and other biological treatment) plus trends in total recycling. Total recycling increased from 11 % in 2001 to 36 % in 2010.

Recycling remains dominated by material recovery which increased from 9 % in 2001 to 32 % by 2010. However, due to reductions in total generation of MSW since 2007, the volume of waste undergoing material recovery actually peaked in 2007 at 1.08 million tonnes. It fell dramatically in 2009 to 0.85 million tonnes before rising again in 2010 to 0.91 million tonnes.

The dip in material recycling in 2009 is likely to have been caused by a drop in the global demand, and resulting fall in prices, for secondary materials towards the end of 2008 following the financial crisis (Hogg *et al*, 2009; Sheehan, 2011). The export market is an important driver for the separation of waste in Ireland for material recovery. The UK is the key market for exports of waste from Ireland (Table 8 in Irish EPA, 2012a), but much of this is likely to be re-exported to eastern markets. China is also the second biggest direct importer of Irish municipal wastes streams (Irish EPA, 2012a).

As shown in Table 2.1 for metal, paper and cardboard, glass, textiles and plastics wastes, recovery of Irish municipal waste is dominated by the export market. For ferrous metal wastes and paper and cardboard wastes, export for recovery abroad represents more than 99 % of the total.

Therefore, a drop in demand for these materials on the world market after 2008 will have had an impact on total material recovery of Irish municipal waste. In particular, export of paper and cardboard wastes for recovery saw a drop of just under 90 thousand tonnes between 2008 and 2009 which may have accounted for a large part of the dip in total material recovery rates between 2008 and 2009. It should be noted that the dramatic change in ferrous metal wastes recovered abroad shown in the table results from a change in reporting procedures rather than a change in actual recovery (see note under the table). However, other metal wastes saw a significant reduction in recovery abroad between 2008 and 2009.

The table also shows that demand for a number of materials including ferrous metals, mixed metals, plastics and paper & cardboard for recovery abroad, increased again in 2010.

Table 2.1 Non-hazardous municipal waste generated in Ireland but recovered abroad – in tonnes and as % of total recovery

| Material | 2008 | | 2009 | | 2010 | |
|-----------------------------------|---------------------------|--|---------------------------|--|---------------------------|--|
| | Recovered abroad (tonnes) | % of total recovered which is recovered abroad | Recovered abroad (tonnes) | % of total recovered which is recovered abroad | Recovered abroad (tonnes) | % of total recovered which is recovered abroad |
| Ferrous metals | 605 136 | 99.6 | 51 772 | 100 | 79 879 | 100 |
| Composites/mixed packaging | 370 | 100.0 | 14 206 | 100 | 564 | 100 |
| Mixed metals | 21 748 | 82.2 | 1 411 | 100 | 10 070 | 100 |
| Aluminium | 14 359 | 82.1 | 4 344 | 99.6 | - | - |
| Paper and cardboard | 590 917 | 99.1 | 504 243 | 99.0 | 520 623 | 99.1 |
| Textiles | 5 061 | 66.8 | 7 187 | 93.8 | - | - |
| Glass | 101 692 | 83.0 | 106 988 | 88.8 | 106 483 | 95.4 |
| Plastic | 52 883 | 70.2 | 49 943 | 68.4 | 58 758 | 80.9 |
| Refuse derived fuel | 26 171 | 99.8 | 11 176 | 23.4 | 48 226 | 51.2 |
| Organic waste | 6 840 | 7.0 | 5 642 | 5.8 | 7 241 | 5.1 |
| Wood | 8 986 | 4.9 | 1 936 | 1.1 | 76 | 0.2 |
| Total | 1 434 163 | 81.6 | 758 848 | 68.9 | 837 969 | 77.1 |

Source: Table 7 Irish EPA (2011) and Table 6 in Irish EPA (2012a)

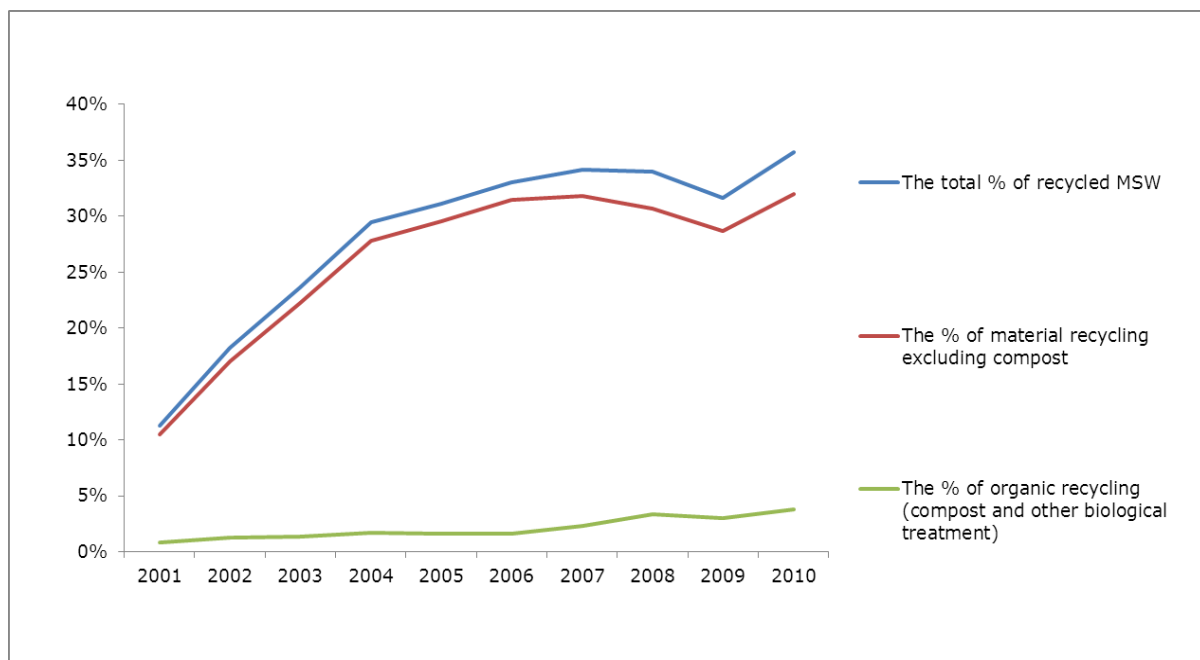
Note: The recovered ferrous metals abroad reported in 2008 also includes metals included in WEEE. These are removed from the reporting in 2009. This does not represent a drop in recovery of ferrous metal but rather a change in reporting.

There must be other factors behind the more general tendency for a dampening in the growth of material recycling of Irish MSW beginning already in 2004 after rapid growth in the first years of the decade. According to Hogg *et al* (2009), one factor might be that the 35 % national target for recovery of municipal waste established in Changing Our Ways in 1998 were not revised in subsequent policy documents. The target set for 2013 which seemed ambitious in the late 1990s was already close to being achieved by the mid 2000s. Despite this, the target was not raised to maintain a high degree of ambition. As such regional authorities were not encouraged to adopt new policies for continuing improvements in waste recovery after the mid 2000s.

Organic recycling (composting and other biological treatment) saw faster growth than material recovery over the past decade and has been most rapid since 2007, the year when material recycling dropped. Organic recycling is much less sensitive to global markets than other material recycling with 95 % of organic recycling taking place within Irish borders (Irish EPA, 2012a).

Despite the sharp growth, organic waste remains somewhat under-utilised in Ireland. According to calculations made using data found in the National Waste Report 2010 (Irish EPA, 2012a) of a total of 643 000 tonnes of collected organic waste in MSW, 142 000 tonnes or 22 % was recycled in 2010².

Figure 2.1 Recycling of MSW in Ireland



Source: Eurostat, 2012

Note: all figures are shown as % of generated MSW

2.1.2 The yearly increase rate of recycling of MSW

The EU's 2008 Waste Framework Directive (WFD) includes a 50 % recycling target for waste from households, to be fulfilled by 2020. Commission Decision 2011/753/EU from 2011 allows countries

² According to Table 16 of the National Waste Report 2010, MSW collected and managed in 2010 comprised 1.421 million tonnes of household waste (this excludes an estimated uncollected quantity of household waste at 266 thousand tonnes) and 1.146 million tonnes of commercial waste plus 19 thousand tonnes of sweepings. According to table H-1 and H-2 in the report 22.7 % of the gross collected household waste and 27.4% of the gross collected commercial waste comprises organic and garden waste. This gives a total collected and managed organic MSW of approx. 643 000 tonnes (this includes all sweepings which are assumed to mainly comprise organic waste). According to Tables 5 and 6 in the report approx. 142 000 tonnes of organic MSW was reported recycled both in Ireland and abroad.

to choose between four different calculation methods to report compliance with this target. Member States have the option of considering four alternative waste streams and fractions:

- a) paper, metal, plastic and glass household waste
- b) paper, metal, plastic, glass household waste and other single types of household waste or of similar waste from other origins
- c) household waste
- d) municipal waste

Compliance with the 50% recycling target in the WFD can be achieved if 50 % by weight of any of the four waste streams is prepared for reuse and recycling.

In order to assess the prospects for countries meeting the 50 % recycling target, the ETC/SCP has developed scenarios for each country's prospects of meeting the 50 % target as interpreted using the broadest possible interpretation - option d) - which includes all MSW. The scenarios assume that recycling in the period 2010 to 2020 develops, based on a linear regression, at the growth rates observed during the periods 2001-2005, 2006-2010 and 2001-2010, respectively.

Figure 2.2 Future recycling of MSW in Ireland

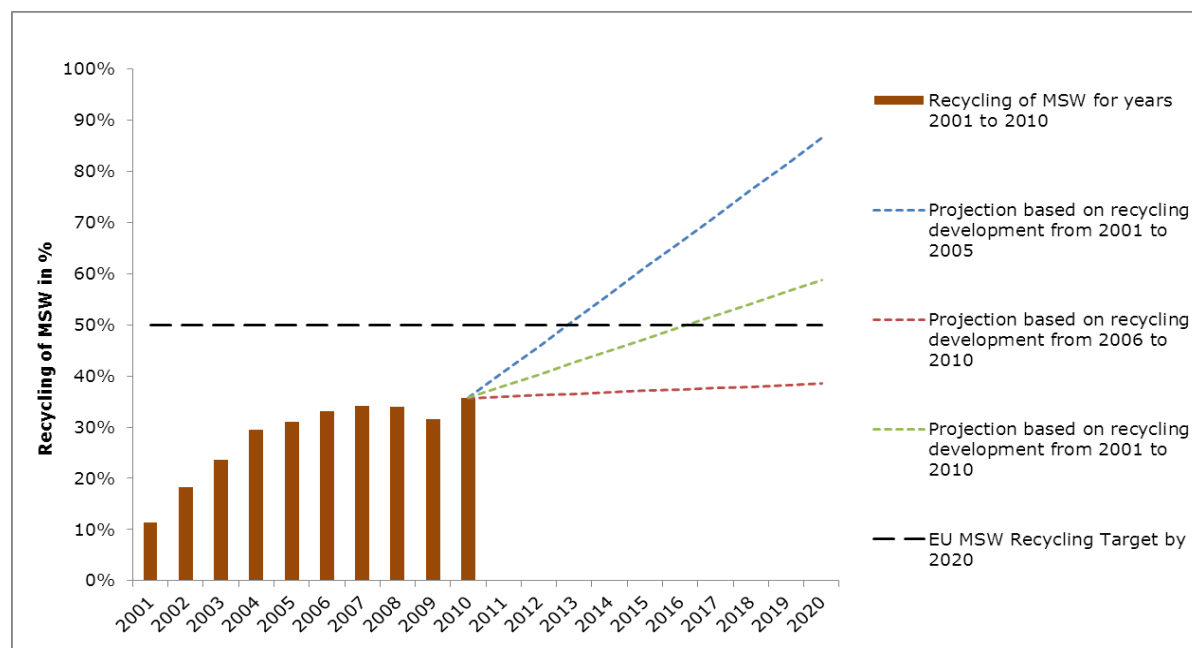


Figure 2.2 shows that only under two of the growth rates would Ireland achieve 50 % recycling of total MSW by 2020. Under growth rates observed during the last few years of the decade it would take many decades before 50 % recycling of MSW was achieved. However, Ireland has elected the first calculation method for demonstrating compliance.

According to the Irish EPA (2012a) the respective target had already been exceeded by 2010 with 53 % of paper, metal, plastic and glass household waste having been recycled.

The significant difference between Ireland's progress according to this calculation method and that illustrated in Figure 2.2 will be largely due to exclusion of organic wastes from calculation method a). Organic MSW is currently not recycled to a large extent in Ireland.

It has to be kept in mind that these three scenarios are very simplistic and do not take into account any planned policy measures. In addition, they are based on one calculation methodology for recycling of municipal waste (MSW recycled/MSW generated, using data reported to Eurostat) whereas countries

may choose to use another methodology to calculate compliance with the 50 % recycling target of the Waste Framework Directive. The scenarios in Figure 2.2 should therefore be interpreted only as to give some rough indications and assessment of the risk of missing the target.

2.1.3 Landfilling of biodegradable municipal waste

It is a general requirement according to the EU Landfill Directive that all Member States have to reduce the amount of biodegradable municipal waste (BMW) sent to landfill with a certain percentage by 2006, 2009 and 2016. The targets are set in relation to 1995 generation figures of BMW. Ireland negotiated a four year derogation period with respect to the first two targets. As such Ireland's targets are that landfilled quantities of BMW must be reduced to 75 % of 1995 BMW by 2010, 50 % by 2013 and 35 % by 2016.

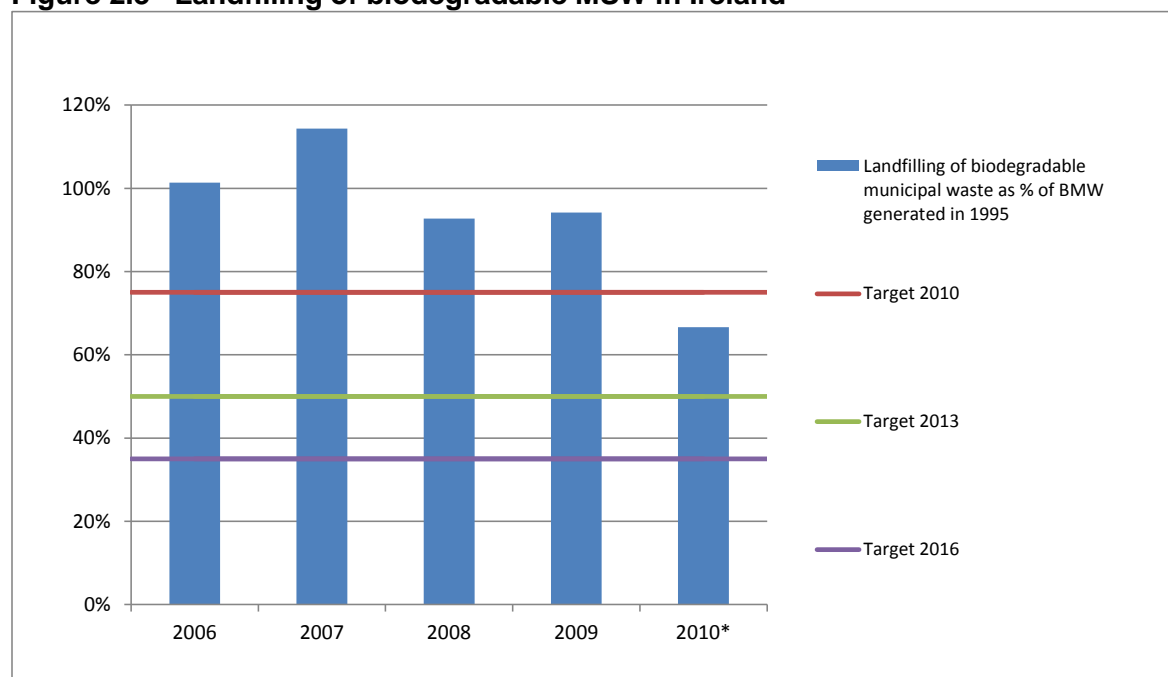
Figure 2.3 shows that the peak year in MSW generation, 2007, was also the peak year for biodegradable waste going to landfill. By 2008, the quantities of biodegradable waste going to landfill reduced somewhat to a level lower than in 2006. While no further improvement was seen in 2009, 2010 saw a significant drop in the quantity of BMW going to landfill, from 1.2 million tonnes in 2009 to 860,000 tonnes in 2010. Using these Irish EPA estimates for 2010, the Landfill Directive's 2010 diversion target appears to have been achieved with a good margin. Whether this development can be maintained in the longer term, however, is uncertain. According to the Irish EPA (2012a), the drop was caused in part by a significant reduction in the generation of MSW. MSW generation fell by 16 % between 2007 and 2010 and is more likely to have been the result of economic recession rather than waste prevention measures although reductions in packaging waste generation following under the Waste Management (Packaging) Regulations 2007 may have been a contributing factor.

The fall followed a continuous trend of increasing MSW generation prior to the recession, increasing by 26 % between 2001 and 2007. Should MSW generation begin to rise again following economic recovery Ireland may be challenged in meeting its 2013 and 2016 diversion targets under the Landfill Directive.

However, the Irish EPA (2012a) also notes that reductions in landfilled BMW also resulted from a sharply reducing share of MSW being sent to landfill. Totally generated MSW reduced by 3.6 % between 2010 and the previous year, but the quantity of MSW sent to landfill reduced by 13 % over the same period.

One driver that may have influenced this diversion of MSW from landfill is the landfill tax levy which was increased gradually between 2007 and 2010. Further more dramatic annual increases have followed and are planned to continue in 2013. This is discussed in more detail in section 2.1.5.

Figure 2.3 Landfilling of biodegradable MSW in Ireland



Source: EC, 2012 * The figure for 2010 is an estimate found in the Irish EPA's 2010 National Waste Report (Irish EPA, 2012a)

Note: the target dates take account of Ireland's derogation periods

A further driver was the passing of the Food Waste Regulations in 2009 which were designed to promote the segregation and recovery of food waste arising in the commercial sector. The Regulations impose obligations on the major producers of commercial food waste to segregate these wastes for separate collection or to biologically treat them on-site. The Regulations are described in more detail in Section 2.2. Although the Regulations did not come into force until the middle of 2010, they may have been a significant factor in the significant reduction of BMW going to landfill during that year.

Efforts to increase separate kerbside collection of waste from households encouraged by the 2006 Strategy on Biodegradable Waste has not had a large effect on BMW sent to landfill to date. Although 34 % of serviced Irish households were given a separate dustbin for collection of organic waste in 2010, up from 24 % in 2009 this only led to a marginal increase in separate collection from 62 447 tonnes in 2009 to 63 836 tonnes in 2010 (Irish EPA, 2012a). This is in part due to lack of control over the waste collection market in Ireland and reduced numbers of households that are serviced. The OECD (2010) commented that, “*despite improvement, [the] municipal waste collection [market] is fragmented and not adequately regulated.*”

However, organic waste composting and anaerobic capacity has increased in Ireland to currently stand at 550 000 tonnes per year (tpy) (Figure 5.1 in Irish EPA 2012b).

Diversion of MSW from landfill may also in part have been made possible by gradually increasing incineration capacity. Incineration of MSW only began at any noticeable level after 2007. According to the Irish EPA (2012b) waste to energy capacity had increased to over 500 000 tpa by 2011. Ireland's first municipal waste incinerator commenced operations towards the end of 2011 (Irish EPA, 2012a). However, cement kilns using waste derived fuels have been established for a longer period.

It should be noted, however, that the Food Waste Regulations require that the food waste, which has been separated and collected from businesses, is sent for biological treatment and not for incineration.

2.1.4 Regional differences in MSW recycling from 2001 to 2010

Given the small national territory and population, as well as arrangement of waste management facilities, waste data in Ireland is reported on a national basis.

2.1.5 The relation between landfill tax level and recycling level of MSW

A levy of EUR 15 per tonne on the landfill of waste was introduced in Ireland on 1 June 2002 under the Waste Management (Landfill Levy) Regulations 2002 to encourage the diversion of waste away from landfill. All levies were earmarked for an Environment Fund in support of waste minimisation and recycling initiatives³.

However, unlike a number of countries where regular, predictable increases in landfill tax were established by landfill tax escalators, the Irish landfill levy saw no further increase until 2008 where the levy was increased to EUR 20 per tonne. This EUR 5/tonne increase was repeated in 2009 and again in 2010 taking the landfill levy from EUR 20 to 30 per tonne⁴.

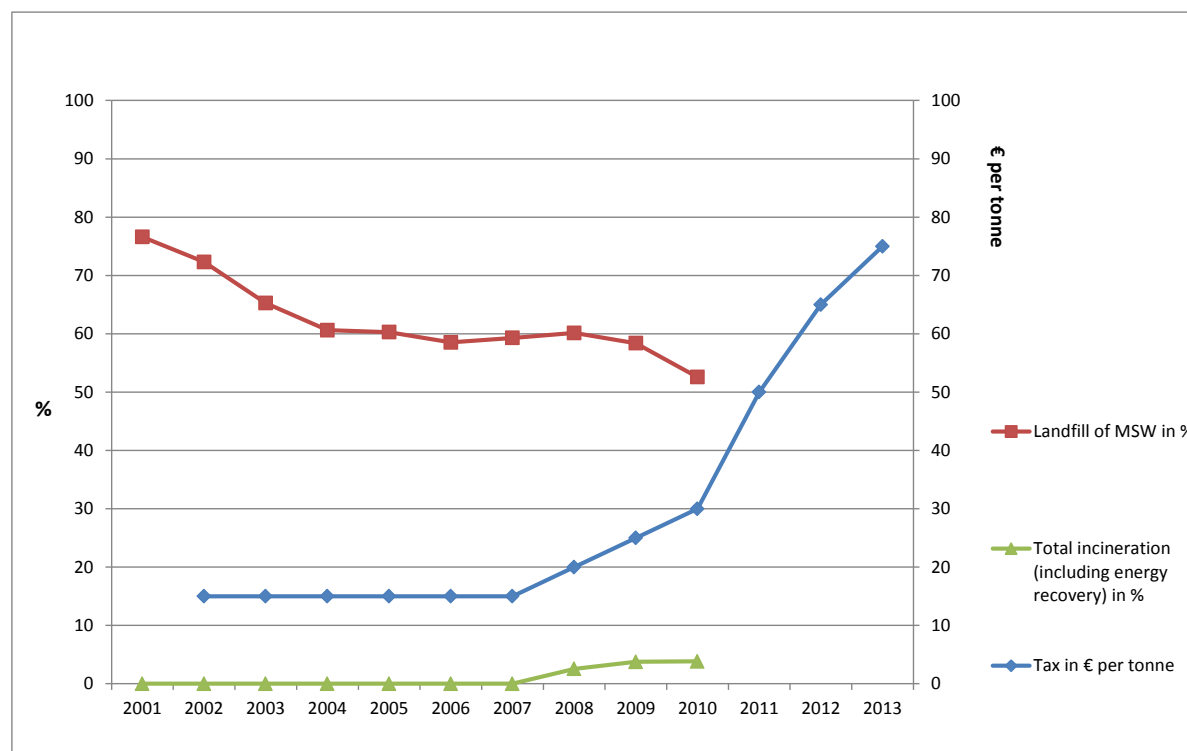
The increase in the tax rates for active waste between 2001 and 2013 are presented in Figure 2.5 along with trends in the share of MSW sent to landfill. The period between 2001 and 2006 saw reductions in the share of MSW being sent to landfill (note that this is all MSW and not just biodegradable) despite no increase in the landfill levy. Since the major part of material recovery of Irish MSW takes place in other countries, these reductions may have resulted from developments in the international market in secondary materials that have little to do with the levy in Ireland. However, a further reduction in the share of MSW going to landfill was seen over the period 2007 to 2010 during which period the tax levy doubled. The gain is even greater when overall quantities of landfilled MSW are considered: the total quantity of landfilled MSW decreased by 26 % between 2007 and 2010.

At first glance it may appear that the increasing levy from 2008 onwards may have been a driving factor in the growth in incineration of waste during the same period. However, planning and building of incineration facilities is typically a long process. The 2002 adoption of the levy may well have been a driver in the original planning of facilities which first came into operation after 2007. It is interesting to note that the Programme for Government of 2007 stated that '*we will not alter the landfill levy in such a way as to give a competitive advantage to incineration*' (Department of An Taoiseach, 2007). As such the intention of the tax levy has been to divert waste from landfill to material recovery and not to incineration.

³ <http://www.environ.ie/en/Environment/Waste/LandfillLevy/>

⁴ <http://www.environ.ie/en/Environment/Waste/LandfillLevy/>

Figure 2.5 Development of landfilling and incineration of MSW and landfill tax in Ireland



Source: ETC/SCP, 2012 and Eurostat, 2012

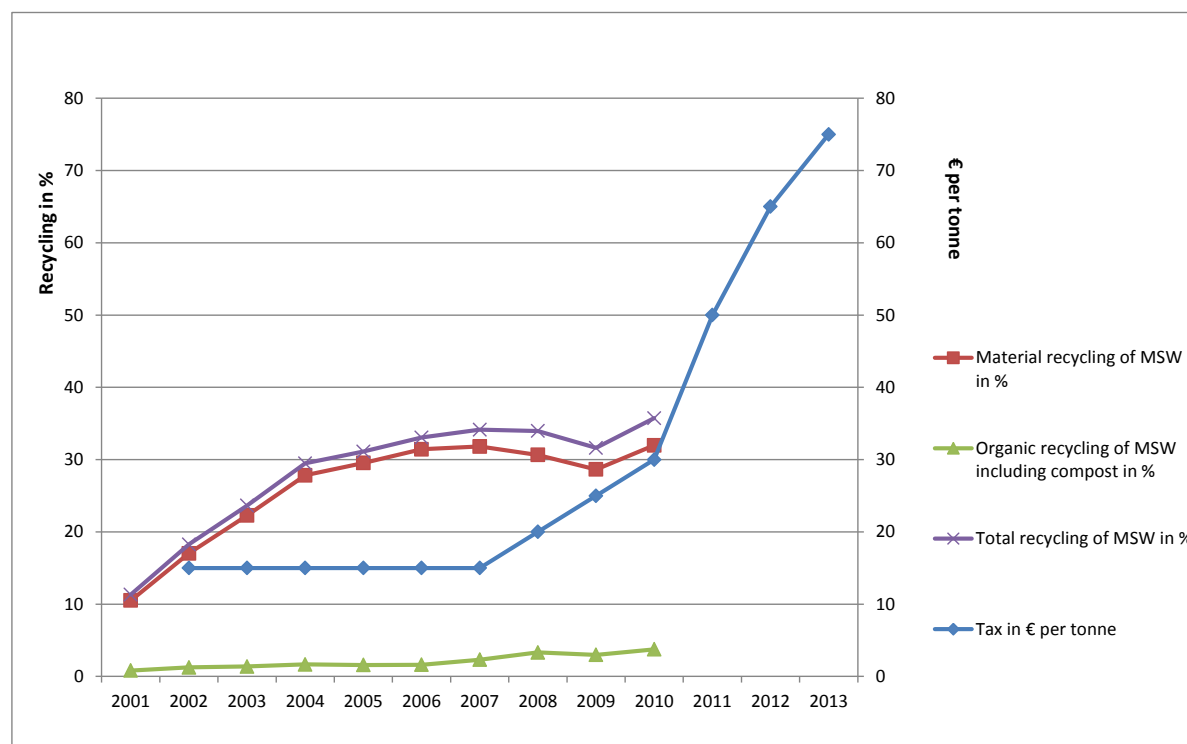
Despite the increases in the landfill levy between 2008 and 2010, by 2011 it had become clear that the levy was not acting as a sufficiently strong economic driver. The Minister of Environment, Heritage and Local Government noted that *'Right now, disposal – which is the most environmentally unsound option for dealing with our waste – is the cheapest'* (Irish Department of the Environment, Heritage and Local Government, 2011). In response he announced the raising of the levy to EUR 50 per tonne in 2011 followed by planned further raises to EUR 65/tonne in 2012 and EUR 75/tonne in 2013.

This was also the first time that raises to the landfill levy were warned in advance with the aim of giving the waste treatment industry and regional authorities the economic certainty needed to make investments in new recycling, MBT and composting facilities.

At the same time he also announced an incineration levy⁵ in keeping with the government commitment not to give a competitive advantage to incineration via the landfill levy. However, this has not materialised.

The effects of the significant increases in the landfill levy from 2010 onwards are yet to be seen in the data since the latest data year is 2010.

Figure 2.6 Development of MSW recycling and landfill tax in Ireland



Source: ETC/SCP, 2012 and Eurostat, 2012

2.1.6 Environmental benefits of better MSW management

Figure 2.7 shows the development of GHG emissions from MSW management, calculated by using a life-cycle approach. The Figure shows the direct emissions, the avoided emissions and the net emissions of the MSW management⁶.

In countries with a low share of landfilling and high rate of recycling, waste treatment can have an overall positive impact on GHG emissions i.e. has an overall effect of reducing GHGs from the economy as a whole. There are eight EU countries where the treatment of MSW also has the effect of reducing overall GHG emissions from the economy by 2010.

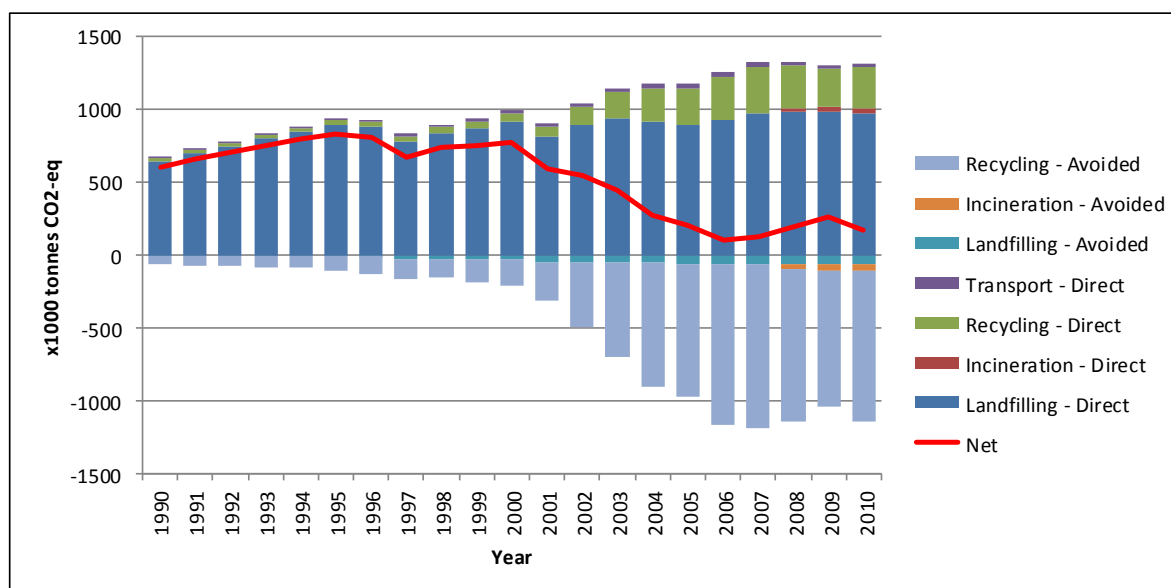
Ireland is not yet one of these countries. However, significant progress has been made since the mid-1990s in reducing net emissions, and by 2006 municipal waste management was close to being a positive contributor to GHG reductions.

⁶ All the GHG emissions (positive values) represent the direct operating emissions for each waste management option. These direct operating emissions have been calculated with the use of the IPCC (IPCC, 2006) methodology for landfills and life cycle modelling for the other technologies (incineration, recycling, bio-treatment and transport).

For the avoided emissions (negative values), the calculations integrate the benefits associated with the recovery of energy (heat and electricity generated by incinerators, electricity generated by the combustion of landfill gas or methane from anaerobic digestion). Other avoided emissions include the benefits of recycling of food and garden waste, paper, glass, metals, plastics, textiles and wood in the municipal solid waste. Recycling is here assumed to include material recycling and biotreatment. Avoided emissions of biotreatment includes fertilizer substitution. All processes generating electricity are assumed to substitute the electricity mix of Ireland in 2009. Processes generating heat are assumed to substitute the average heat mix for the EU-25 in 2002. The electricity mix and heat mix are assumed to remain constant throughout the whole time series. The composition of the MSW disposed in landfills, incinerated or recycled respectively are based on Bakas et al., (ETC/SCP, 2011). In an Eionet consultation process, initiated by the EEA in 2012, Ireland updated the composition of the recycled MSW for 2010. The complete methodology is available in ETC/SCP, 2011.

Net GHG emissions from treatment of MSW in Ireland peaked in 1995 at 836 thousand tonnes CO₂-equivalents after which they began to fluctuate but with a general downward trend. The emissions reached a minimum in 2006 at 99 thousand tonnes. This was entirely due to gains in offset emissions due to material separation and recycling rather than any reduction in the direct emissions from landfilled MSW. In fact the direct GHG emissions from landfill were higher in 2006 than in 1995 and continued to rise until 2008. A simultaneous reduction in material recycling after 2006 led to an overall increase in net GHG emissions from MSW management which had risen again to 267 thousand tonnes by 2009.

Figure 2.7 GHG emissions from MSW management in Ireland



Note: Results presented in this figure should not be used for the compilation of GHG reporting (national inventory report of the IPCC) or compared with IPCC figures, as the methodology employed here relies on life cycle thinking and, by definition, differs from the IPCC methodology.

These trends further illustrate the urgent need to divert BMW from landfill. This or increased emissions capture in landfills are the only methods by which the direct emissions from landfills can be reduced, thus driving net emissions from management of MSW downwards. It is the biodegradable waste that leads to the production and emissions of carbon dioxide and methane in landfills.

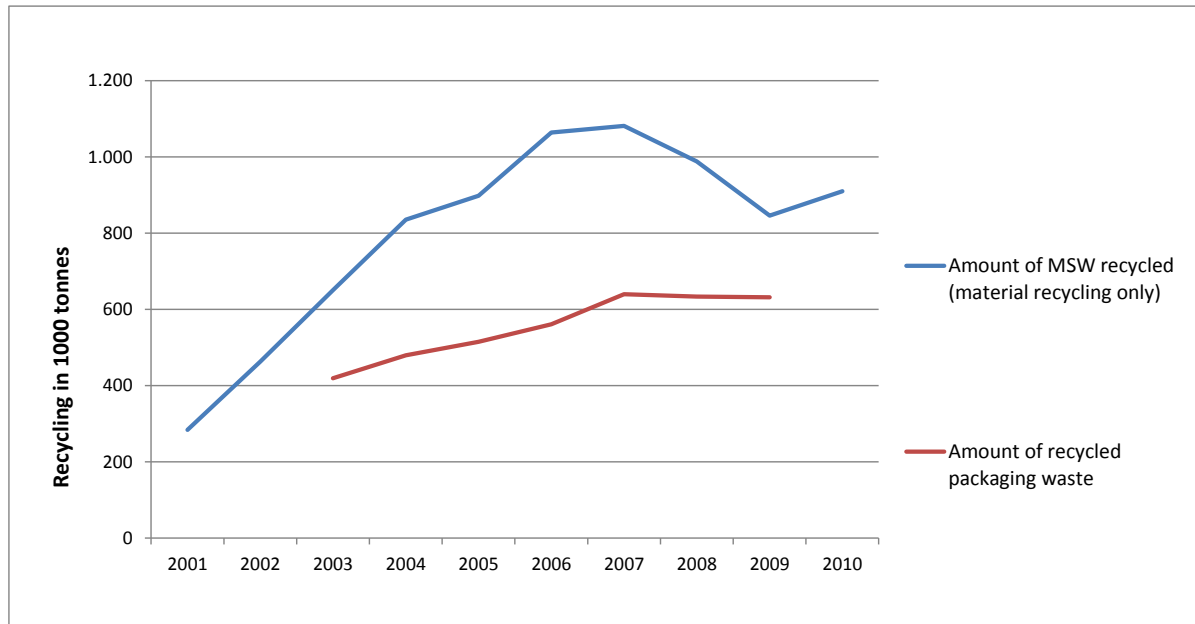
It is important to note that reductions in GHG emissions from landfills resulting from diversion of BMW from landfill BMW will be gradual, even if the landfill diversion is rapid. This is because GHG emissions from landfills are caused by the breakdown of organic wastes accumulated in landfills over the past 50 years, and not just from organic waste deposited over the previous year. There will be a significant time lag between success in diverting BMW and seeing the full positive results of that success in reduced net GHG emissions from waste management.

2.2 Uncertainties in the reporting

Some uncertainties or differences included in the reporting of MSW can result in different recycling levels. One example of such differences which might influence the recycling rate of MSW is the extent to which packaging waste from households and similar packaging from other sources is included in the reported recycling of MSW. MSW in Ireland includes all commercial wastes and wastes from services including all packaging (Irish EPA, 2012c).

Figure 2.8 shows that the level of packaging waste recycled in Ireland has been consistently lower than the total quantity of MSW undergoing material recycling since data on packaging recycling became available in 2003, with the gap increasing gradually until 2007. This confirms that packaging waste is included in MSW reporting in the Ireland. It also suggests that while the majority of recycled MSW waste may have comprised packaging in 2003, recycling of other types of MSW increased until 2007 after which point this trend reversed.

Figure 2.8 A comparison of packaging waste and MSW recycled quantities



Source: Eurostat, 2012

MBT is seen as an important treatment of residual waste in Ireland in the future. The Programme for Government of 12 June 2007 stated ‘*We are..... committed to meeting the targets to divert biodegradable waste from landfill required under the 1999 EU Landfill Directive. To achieve this, we are committed to the introduction of Mechanical Biological Treatment facilities as one of a range of technologies*’ (Department of the Taoiseach, 2007, p. 22). This is also reflected in eight out of the ten regional waste management plans which identify MBT as being an important contributor to diverting BMW from landfill in order to meet the targets under the Landfill Directive (Guinan et al, 2008).

However, MBT is only reported as treatment capacity in Ireland and not in final recycling or recovery figures unless it is the final destination for any specific waste stream (Irish EPA, 2012c).

2.3 Important initiatives taken to improve MSW management

Waste management policy in Ireland at the national level is detailed in a set of three policy documents produced:

- Changing Our Ways, 1998
- Delivering Change – Preventing And Recycling Waste, 2002
- Waste Management - Taking Stock and Moving Forward, 2004
- A Resource Opportunity – Waste Management Policy in Ireland, 2012

Changing Our Ways (1998) set the following targets relevant to MSW for achievement by 2013:

- a diversion of 50 % of overall household waste away from landfill,
- a minimum 65 % reduction in biodegradable municipal wastes consigned to landfill (implementation of Landfill Directive),
- material recycling of 35 % of municipal waste

Delivering Change (2002) identifies a range of actions to be taken aimed at preventing the generation of waste and encouraging recycling of waste to achieve the targets set out in *Changing Our Ways*. It puts forward the Irish Government's proposals across this range of measures. Examples of interest to MSW are: establishment of a National Waste Prevention Programme (NWPP) and Core Prevention Team (CPT) within the EPA to drive this initiative; establishment of a National Waste Management Board to evaluate the contribution of local and regional waste management plans (see below) to the achievement of national waste management targets, to undertake public awareness and education campaigns in relation to waste management and review European actions to advise on additional policy implementation measures in Ireland; remove planning obstacles to establishment of bring banks; provide EUR 127 million in EU/Exchequer support for waste recovery infrastructure, including recycling infrastructure, in the period 2002 – 2006; and to establish the landfill levy in 2002 (see below).

Taking Stock and Moving Forward (2004) reviewed the waste management policy provided by the earlier documents to ensure that they are in keeping with the waste hierarchy given in the Waste Framework Directive of 2002, and reviewed progress in the implementation measures set out in the *Delivering Change* document.

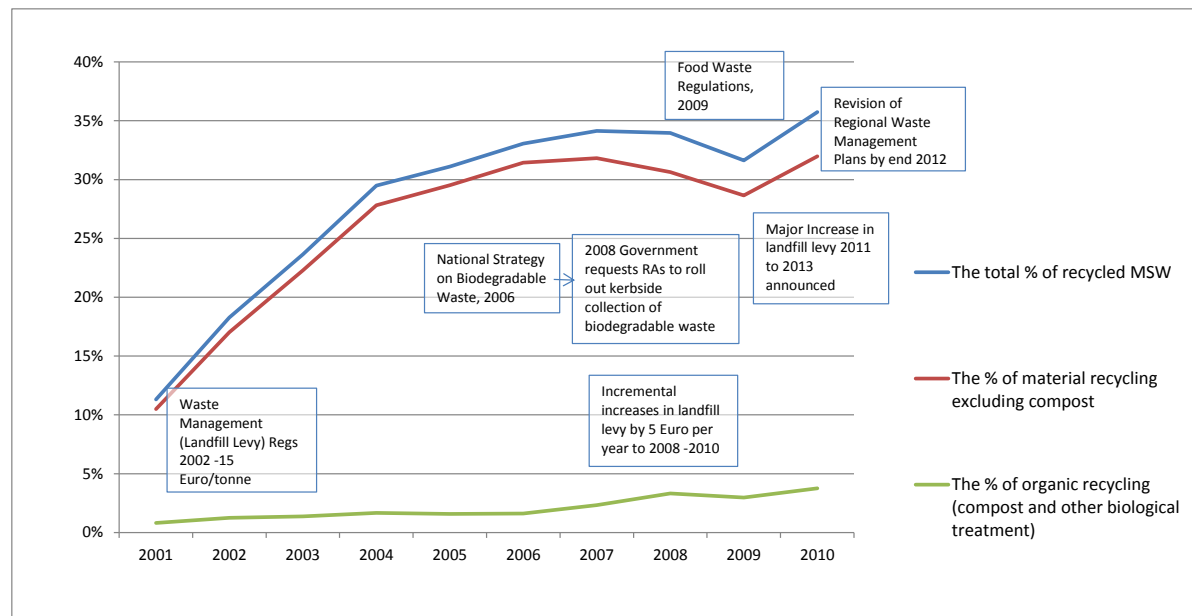
A Resource Opportunity (2012) sets out how it will be ensured that waste management plans will be more aligned with national policy in the future. It promises a strengthening of the waste collection permit system and use of the Producer Responsibility Initiative (PRI) model to encourage households to reuse and recycle their wastes. The policy document promises the introduction of Household Food Waste Regulations ensuring the separate collection of organic waste from households and requiring households to make use of the collection (DECLG, 2012a).

A national waste management plan for MSW does not exist (with the exception of the National Plan for the BMW component of MSW which was made in 2006) although it has been proposed. Under the 1996 Waste Management Act (as amended) regional authorities are required to develop *Regional Waste Management Plans* (RWMP) to implement the national waste policies set out in the various waste policy documents. A total of 10 local and regional waste management plans have been prepared covering all 34 local authority areas (Irish EPA, 2012d). However, the current programme of reform of local government structures will reduce the number of regional authorities, and subsequent waste management plans, to a maximum of three (DECLG, 2012a).

Each of the regional plans is currently undergoing a review to ensure that they contribute to national targets and are compliant with national waste policy and also that they are in compliance with the EU WFD 2008. The review is being carried out by the regional authorities under guidance from the

National Waste Management Board, and must be completed before the end of 2012⁷. Some have argued that implementation of national targets given in policy documents could be more effectively and consistently ensured through development of a national waste management plan (Hogg et al 2009). Implementation in RWMPs is made more problematic by the fact that national policy is not always clear about which targets and policies the regions are expected to implement (Hogg et al, 2009).

Figure 2.9 Recycling of MSW in Ireland and important policy initiatives



One area in which RWMA's have been implementing the 2013 target for 50 % diversion of household waste from landfill has been the setting up of separate kerbside collection for dry recyclables. By 2010, 95 % of households serviced by waste collection had a separate bin for collection of dry recyclable wastes i.e. glass, plastic, metal containers and packaging waste.

Returning to the national level, the *National Strategy on Biodegradable Waste (2006)* as promised in the Delivering Change document sets specific objectives for the contributions that recycling, biological treatment and thermal treatment will contribute to the achievement of the 2016 target for diversion of BMW from landfill. It proposes that, by 2016, recycling (principally of paper and cardboard waste which cannot be reused) will divert 875 371 tonnes (38.6 %) from landfill with biological treatment (mainly food and garden waste) contributing 442 129 tonnes (19.5 %) to the overall target. Thermal treatment will divert 499 762 tonnes (22 %) of residual waste from landfill by the same date (Irish EPA, 2012e). It also established a longer term target of 80 % diversion of biodegradable waste from landfill.

A key implementation element of the strategy was the passing of the Food Waste Regulations into law in 2009 and the implementation of the EPA Municipal Waste Pre-Treatment obligations⁸. The Regulations are designed to promote the segregation and recovery of food waste arising in the commercial sector. The Regulations impose obligations on major producers of food waste, including supermarkets, restaurants and cafés, canteens, hotels, supermarkets and other food retailers, to segregate food waste and make them available for separate collection and subsequent biological treatment. Alternatively, these materials can be biologically treated on-site under specified conditions.

⁷ <http://www.connachtwaste.ie/media/Media,17845,en.pdf>

⁸ <http://www.epa.ie/downloads/advice/waste/municipalwaste/name,26146,en.html>

Small businesses which produce less than 50 kg of food waste per week were exempt from the Regulations for the first year.

No such binding regulations apply to household organic waste currently but are signposted in the recently published Waste Policy (A resource Opportunity, 2012). Rather the government has passed on the responsibility for separate collection to local authorities. In 2008 the national government requested local authorities to implement source-segregated collection systems for organic waste along with educational awareness campaigns and targeted enforcement to ensure that separation systems are used by households. By 2010, 34 % of those households in Ireland *which are serviced by kerbside waste collection* had been supplied with an additional waste bin for separate collection of organic waste up from 24 % in 2009. This is a so-called 3-bin service: adding an organic waste bin to the 2-bin service comprising one bin for dry recyclables and one for residual wastes.

However, deregulation of household waste collection services in Ireland in favour of a competitive market-based system has led to a fragmented and not adequately regulated service (OECD, 2010). An estimated 29 % of occupied Irish households do not use or were not offered, a kerbside collection service in 2010 (Irish EPA, 2012a). Moreover, according to a recent regulatory impact analysis the current regulatory system for waste collection services renders a system with a number of weaknesses including low rates of householder participation, insufficient levels of segregation of household waste, and pricing structures which do not incentivise sustainable behaviours. This is in part due to lack of control over whether the conditions included in waste collection permits are being adhered to (DECLG, 2012).

In addition to the regulations described above a number of other legal instruments (e.g. the Waste Management Acts 1996 to 2012) governing the management of waste and outlining the responsibilities of waste generators, waste management organisations have been adopted by parliament.

Of these the Packaging Regulations of 2003 and amended in 2006 are the most relevant to MSW since much of packaging waste is considered to be MSW. The Regulations implement the Packaging Directive. The 2003 regulations required Ireland to achieve recovery rates of 50 % or more by end 2005. A further 60 % recovery target by 2011 was established by the 2006 amendment⁹.

The 2003 Regulations implemented the Packaging Directive by placing the responsibility on packaging producers, including retailers, to segregate packaging waste arising on their own premises into specified waste streams and have it collected by authorised operators for recycling. In addition, major producers were given additional responsibilities with regard to the recovery of packaging waste from their customers, either through carrying this activity out themselves or becoming a member of a packaging waste compliance scheme (Irish EPA, 2012f). The Regulations proved successful and the 50 % 2005 recovery target had already been reached by 2003, and the 60 % 2011 recovery target by 2007 (EEA, 2010).

Finally, as described in Section 2.1.5 the Landfill Levy established in 2002 has probably not been a strong driver in diverting waste from landfills towards energy and material recovery due to the low and static level (in comparison to other leading EU countries) of the levy at EUR 15 per tonne between 2002 and 2007. The yearly increases of EUR 5/tonne in 2008 to 2010 and the further more dramatic rolling increases announced in 2011 which will give a EUR 75 per tonne levy by 2013 are likely to establish the landfill levy as a far more persuasive driver than it has been earlier in the decade.

⁹ The Packaging Directive set this 60% target for 2008 but Ireland, along with two other European Member States negotiated a three year derogation. See http://europa.eu/legislation_summaries/environment/waste_management/121207_en.htm

It can be concluded that waste management policy in Ireland seems to be driven largely by European waste directives and the key targets set in the various Irish policies go no further than what is required under the EU Directives. As far as implementation is concerned, the key binding policy measures relevant to MSW include the landfill tax levy, the food waste regulations, the packaging regulations and EPA licensing and enforcing operations at landfill sites.

The lack of a national waste management plan in favour of regional plans may be a hindrance to policy implementation although the regional plans do undergo regular review to ensure that they are in line with achieving national (and thereby European) policy targets.

Lack of regulation and control of the waste collection market in Ireland also seems to be a potential weakness in the waste management sector undermining the potential for the Irish government to achieve its own objectives and obligations under European Directives. The new waste policy document has stressed that this will be tackled by a tightening and stronger enforcement of the waste collection permitting system (DECLG, 2012a).

2.4 Future possible trends

As identified in Section 2.1.3 due to a sharp fall in the quantity of BMW being deposited at landfill sites between 2009 and 2010 Ireland achieved its 2010 target for diversion of BMW from landfill by a relatively large margin. This was achieved through a combination of factors including a drop in the proportion of biodegradable waste consigned to landfill, EPA licensing and enforcement activities at landfill sites, BMW commercial food waste diversion successes.

However, the significant 16 % reduction in the generation in MSW between 2007 and 2010 was perhaps the most significant factor behind achieving the 2010 target and is more likely to have been the result of economic recession rather than waste prevention methods.

Should MSW waste generation begin to rise again following economic recovery Ireland may be challenged in meeting its 2013 and 2016 diversion targets under the Landfill Directive. The Economic and Social Research Institute in Ireland predicts an 850,000 tonne increase in MSW over the next 15 years following economic recovery (Irish EPA, 2012a). The Irish EPA assesses that the 2013 and 2016 targets are at risk of not being met without considerable effort.

The Landfill Levy escalator may be one of the key policy measures in meeting the challenge. As described in section 2.1.5 the escalator announced in 2011 will progressively lead to a charge of EUR 75 per tonne by 2013, increased from EUR 30/tonne in 2010.

However, responding to this economic driver will require both more widespread separation of organic waste from household and commercial waste streams and installation of facilities to process the resulting separate organic fractions. As described earlier, the Food Waste Regulations, if sufficiently enforced should ensure the separation of commercial food waste for biological treatment (incineration of these wastes is prohibited under the Regulations). Although no such regulations exist yet for household food waste a number of authorities, encouraged by the Strategy on Biodegradable Waste, have set up separate kerbside collection of food wastes from households with 34 % of serviced Irish households being covered by this service by 2010. Plans for Household Food Waste Regulations were announced in the Government's 2012 waste policy document - *A Resource Opportunity* - which will oblige all waste collectors to provide for such separate collection of food wastes (DECLG, 2012a).

Even with separate collection there is currently no guarantee that this will lead to significantly greater separate capture of organic waste from households. Even in those households with separate collection up to 47 % (by weight) of the contents of the residual waste bins has been found to comprise biodegradable waste (Irish EPA, 2012a). Moreover, a large proportion of Irish households (29 % in 2010) are not offered or do not make use of kerbside waste collection services at all. A recent

regulatory impact assessment of waste collection services found a number of weaknesses in the system that consequently undermine government targets for separation and recycling of wastes.

The assessment makes a number of recommendations including imposing an obligation on all households to demonstrate that they manage their waste in compliance with legal requirements and mandatory pricing structures to incentivise sustainable behaviours (DECLG, 2012b). These recommendations have been taken up by the new government waste policy document which indicates that the coming Household Food Waste Regulations will include such requirements.

An additional need is for further development of capacity to make use of the biodegradable component of residual household and commercial wastes. This could be either incineration facilities or mechanical biological treatment (MBT) facilities.

The first commercial municipal waste incinerator was put into operation in 2011 with a capacity of 0.2 Mt per year adding to the 0.3 Mt per year capacity represented by cement kilns using waste derived fuels in co-combustion (Irish EPA, 2012b). Two further licences for municipal incinerators have been granted at Ringaskiddy and Poolbeg (Irish EPA, 2012a). However, planning permission was subsequently rejected for the Ringaskiddy incinerator.

According to the Irish EPA (2012a) *‘Ireland remains underdeveloped with respect to the sophistication of essential waste infrastructure for the pre-treatment of municipal waste prior to disposal (e.g. anaerobic digestion, waste to energy, mechanical biological treatment etc.). It will be a challenge to meet waste diversion and waste recovery targets if municipal waste generation increases with economic recovery and the necessary waste infrastructure is not in place.’*

The Irish EPA recommends priority policy actions in ensuring that adequate infrastructure both for treatment of kerbside separated organic waste and for treatment and bio-stabilisation of the organic components in residual wastes destined for landfill along with policy requiring householders to use organic bins, and continuation of food waste prevention programmes if the 2013 and 2016 targets are to be met.

Turning to the 2020 goal for 50 % recycling of household waste set by the Waste Framework Directive, latest data indicated that this target, according to the calculation option used by Ireland, had already been exceeded in 2010. However, it should be noted that the vast majority of dry recyclables in Ireland are exported for recovery due to lack of recycling facilities. Thus, continuing to achieve the 50 % recycling of household waste target in the future is subject to volatile global prices for recyclates. The economic viability of separate waste fraction collection in Ireland is strongly influenced by these prices.

References

Department of An Taoiseach (2007) *An Agreed Programme of Government: A Blueprint for Ireland's Future 2007– 2012*; available from: <http://www.taoiseach.gov.ie/index.asp?locID=512&docID=3493>.

DECLG (2012a) *A Resource Opportunity – Waste Management Policy in Ireland* Department of Environment, Community and Local Government, Dublin.
<http://www.environ.ie/en/PublicationsDocuments/FileDownload,30729,en.pdf>.

DECLG (2012b) *Summary of Regulatory Impact Analysis – Household Waste Collection*. Department of Environment, Community and Local Government, Dublin.
<http://www.environ.ie/en/PublicationsDocuments/FileDownload,30784,en.pdf>.

EC, 2012: Member States' reporting to the Commission according to Council Directive 1999/31 of 26 April 1999 Landfill Directive and [Commission Decision 2000/738/EC](#) concerning a questionnaire for Member States reports on the implementation of Directive 1999/31/EC on the landfill of waste. E-mail from the Commission to the EEA on 16 February, 2012.

EEA (2010) *The European Environment – State and Outlook 2010*. Part C Country Fact Sheets. Ireland. European Environment Agency, Copenhagen. <http://www.eea.europa.eu/soer/countries/ie>.

ETC/SCP (2009) *Country Waste Fact Sheet for Ireland*. Internet resource of the European Topic Centre on Sustainable Consumption and Production.
http://scp.eionet.europa.eu/facts/factsheets_waste/2009_edition/factsheet?country=IE.

ETC/SCP, 2011: Bakas, I., Sieck, M., Hermann, T., Andersen, F. M., Larsen, H. and Reichel, A. Projections of Municipal Waste Management and Greenhouse Gases. ETC/SCP working paper 4/2011. Copenhagen, Denmark, 89 pp.

ETC/SCP, 2012: Christian Fischer, Mathias Lehner and David Lindsay McKinnon 'Overview of the use of landfill taxes in Europe'. ETC/SCP Working paper 1, 2012.
http://scp.eionet.europa.eu/publications/WP2012_1.

Eurostat, 2012: 'Waste database municipal waste'
<http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/data/database> Accessed May 2012.

Guinan, B., D. Milton, R. Kirkman, T. Kristiansen, D. O'Sullivan (2008) *Critical Analysis of the Potential of Mechanical Biological Treatment for Irish Waste Management – Synthesis Report*. Report prepared for Irish EPA under the STRIVE programme.
http://www.epa.ie/downloads/pubs/research/waste/strive_16_guinan_mbt_web.pdf.

Hogg, D., A. Gibbs, A. Ballinger, A. Coulthurst, T. Elliott, D. Fletcher, S. Russell, C. Sherrington, S. Taylor, D. Wilson, S. Finlay, D. Grehan, M. Hogan, P. O'Neill, M. Steiner, A. Hermann, M. Buchert I. Laureysens, M. van Acoyleyn, E. Favoino and V. Caimi (2009) *International Review of Waste Management Policy: Summary Report*. Report commissioned by the Department of Environment Heritage and Local Government
<http://www.environ.ie/en/Publications/Environment/Waste/WasteManagement/FileDownload,21596,en.pdf>.

Irish Department of the Environment, Heritage and Local Government (2008) *Implementation of Segregated "Brown Bin" Collection for Biowaste and Home Composting* Circular WPPR 17/08 for City and County Managers.
<http://www.environ.ie/en/Publications/Environment/Waste/WasteManagement/FileDownload,18446,en.pdf>.

Irish Department of the Environment, Heritage and Local Government (2011) Minister Hogan Moves to Provide Certainty on Waste Policy. News item on Dept. website 14/04/11.
<http://www.environ.ie/en/Environment/Waste/News/MainBody,25950,en.htm>.

Irish EPA (2011) *National Waste Report, 2009*. Irish Environmental Protection Agency. Wexford.
http://www.epa.ie/downloads/pubs/waste/stats/EPA_NWR_09_web.pdf.

Irish EPA (2012a) *National Waste Report, 2010*. Irish Environmental Protection Agency. Wexford.
http://www.epa.ie/downloads/pubs/waste/stats/EPA_NWR_2010_web.pdf.

Irish EPA (2012b) *Ireland's Environment: An Assessment*. Irish Environmental Protection Agency. Wexford. http://www.epa.ie/downloads/pubs/indicators/00061_EPA_SoE_2012.pdf.

Irish EPA (2012c) Information received during the Eionet consultation of the paper. E-mail of 4th October 2012 from Jonathan Derham, Irish Environmental Protection Agency.

Irish EPA (2012d) Waste Management Plans. Internet Resource last accessed on 31 July 2012.
<http://www.environ.ie/en/Environment/Waste/WasteManagementPlans/>.

Irish EPA (2012e) National Strategy on Biodegradable Waste. Internet Resource last accessed on 31 July 2012.
<http://www.environ.ie/en/Environment/Waste/ProducerResponsibilityObligations/NationalStrategyonBiodegradableWaste/>.

Irish EPA (2012f) Packaging Waste. Internet Resource last accessed on 31 July 2012.
<http://www.environ.ie/en/Environment/Waste/ProducerResponsibilityObligations/PackagingWaste/>.

Organisation for Economic Cooperation and Development (2010) *OECD Environmental Performance Reviews – Ireland*, Paris.

Sheehan, J. (2011) *Recycling Markets in the Current International Economic Climate*. Australian National Packaging Covenant Industry Association. Background Paper Series 1.
<http://www.packagingcovenant.org.au/documents/File/Recycling%20markets%20in%20the%20Current%20International%20Economic%20Climate%20v1%20FINAL.pdf>.