ETC/SCP

European Environment Agency

Municipal Waste Management in the United Kingdom

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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

Contents

Highlights

- The UK government committed in 2010 to a better alignment of MSW-reporting with the EU's definition of MSW, with more consistent inclusion of commercial waste;
- The share of MSW landfilled in the UK reduced from 80 % in 2001 to 49 % in 2010. Recycling (material and organic) increased dramatically over the same period though growth dampened towards the end of the decade. Large variations in recycling rates are seen at the regional level;
- The UK was close to achieving its derogated 2010 BMW diversion target under the Landfill Directive by 2006. The 2013 derogated target was exceeded by 2009;
- The net upstream and downstream contribution of MSW treatment to GHG emissions, based on a life-cycle approach, remained negative in 2010 at 4.3 million tonnes CO2-equiv. of additional emissions, but had reduced from 12.4 million tonnes in 2001;
- The landfill allowance trading schemes (LATS) has been a major driver of rapid landfill diversion and recycling rates. By 2010 the landfill tax escalator for active waste had become the more influential policy instrument;
- The Packaging Waste Regulations in combination with a buoyant Asian market for packaging wastes and recyclates have also been key drivers in increasing recycling rates. Establishment of WRAP UK has been an important initiative for capacity building;
- There is a high level of confidence that the 50 % MSW recycling target will be met by 2020, but slightly lower confidence about meeting the 2020 Landfill Directive target. This is in part due to concerns over the time available to build the necessary recycling and recovery facilities for organic wastes.

1 Introduction

1.1 Objective

Based on historical MSW data for UK 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 United Kingdom's MSW management performance

Waste policy is a devolved matter in the UK. The devolved administrations of Scotland, Wales and Northern Ireland are responsible for strategy and policy relating to waste management in those regions. Despite differences in the specifics of policy measures, national priorities for waste have been consistent in aiming to drive action further up the waste hierarchy, thus making a transition from landfill of waste, towards prevention, re-use and energy recovery, along with a reduction of GHG emissions from waste management.

In general, successive waste strategies in each region (2000 Waste Strategy in England & Wales; 2007 Waste Strategy, England; 2009 Towards Zero Waste Strategy, Wales, 2010 Zero Waste Strategy, Scotland, 2006 Waste Management Strategy, N. Ireland) have tended to establish increasingly ambitious targets for recycling of household and municipal waste, and for diversion of waste from landfills.

Although each devolved region in the UK has its own targets for management of MSW, the data reported to Eurostat and presented in this analysis is for the UK as a whole.

The generation of MSW peaked in the UK at 36.1 million tonnes in 2004 and has since decreased steadily to 32.4 million tonnes in 2010 (Eurostat, 2012). However, it should be noted that reporting of MSW in the UK is not entirely consistent with that required by the European Commission as specified in the Waste Framework Directive. Some Local Authorities only report on waste collected from households as municipal waste while others include commercial waste.

In late 2009, following pressure from the Commission, the UK's Department for Environment, Food and Rural Affairs (Defra) announced proposals to ensure a more consistent scope of reporting of MSW by Local Authorities (LAs) in line with the Commission's definition which includes commercial waste (Sloley, 2009). There appears to be a major information gap; waste from the commercial sector has not been surveyed comprehensively since 2002-2003 (EFRA Committee, 2010).

Following a countrywide consultation in March 2010, the UK government committed to following the new definitions in relation to biodegradable municipal waste (BMW) sent to landfill as reported under the Landfill Directive (Defra, 2010a). The inclusion of commercial waste in MSW can be expected to

significantly increase the total amount of MSW reported by the UK (360Environmental, 2010) and to almost double the amount of BMW going to landfill as reported under the Landfill Directive (Defra, 2010b).

The adjusted definitions and resulting estimates for BMW which has been diverted from landfill have been used to produce Figure 2.3 in this report (on the UK's progress against the targets in the Landfill Directive). However, all other figures in this report present data and results according to the UK's earlier definition of MSW.

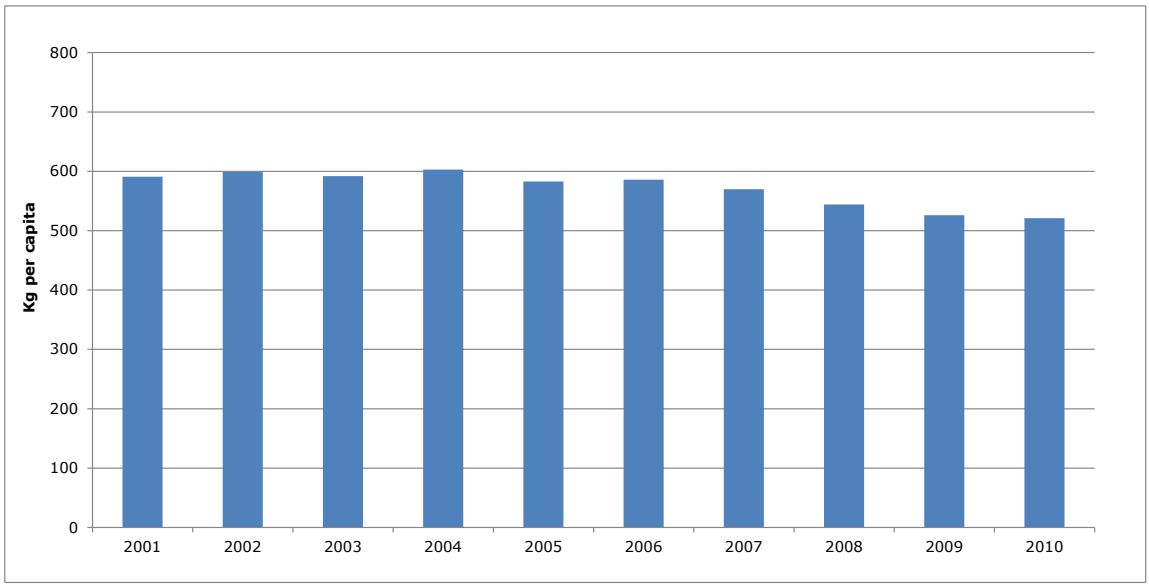
2.1 MSW Indicators

Figure 2.0 shows the development in MSW per capita in the UK between 2001 and 2010. It can be seen that following a reasonable stable period in MSW generation at the beginning of the decade, MSW began to fall after 2004 and by 2010 had fallen to 521 kg/capita, 14 % lower than the 2004 peak at just over 600 kg/capita.

Waste management of MSW changed significantly over the same decade. Until 2009, the majority of MSW generated in the UK ended in landfill. However, the share of MSW landfilled reduced significantly during the first decade of the millennium falling from 80 % in 2001 to 49 % in 2010. Recycling (material and organic) of MSW increased dramatically over the same period.

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

Figure 2.0 MSW Generation per capita in the United Kingdom



Source: Eurostat, 2012

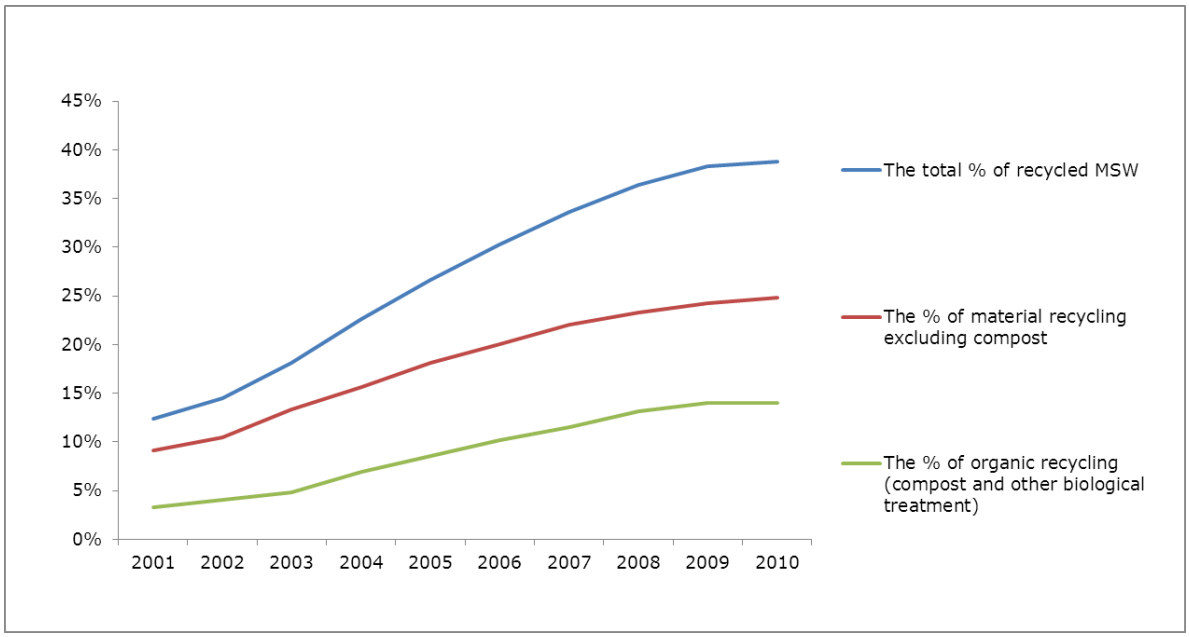
2.1.1 The recycling of MSW from 2001 to 2010

Figure 2.1 shows the development of recycling of MSW in the UK, both individual trends in material recycling and organic recycling (compost and other biological treatment) plus trends in total recycling. Total recycling increased from 12 % in 2001 to 39 % in 2010.

Recycling remains dominated by material recovery which increased from 9 % in 2001 to 25 % by 2010. More than 8 million tonnes of MSW were sent for material recovery in 2010. Although organic recycling remains of less importance (4.5 million tonnes in 2010) it has seen an even faster growth

than material recovery over the past decade. It should be noted, however, that growth in both forms of recycling slowed down significantly towards the end of the last decade.

Figure 2.1 Recycling of MSW in the United Kingdom



Source: Eurostat, 2012. Note: all figures are shown as % of generated MSW

2.1.2 The yearly increase rate of recycling of MSW

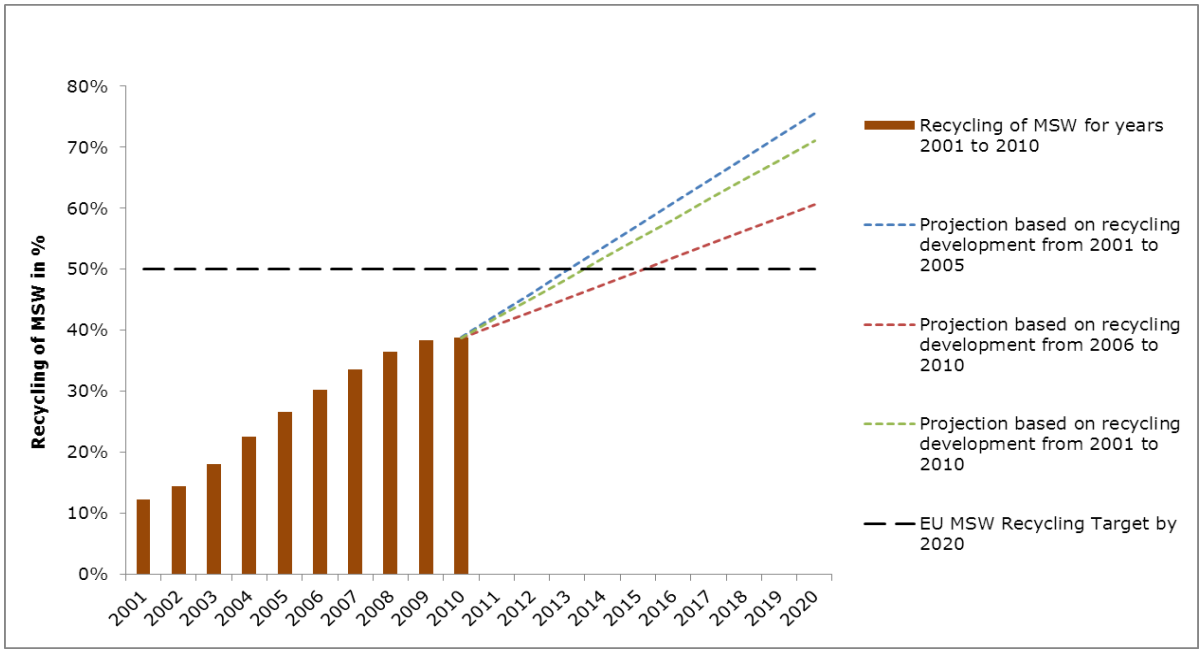
In order to assess the prospects for the UK meeting the 50 % recycling target as set out in the Waste Framework Directive, three scenarios have been calculated and are shown in Figure 2.2. The scenarios assume that recycling in the period 2010 to 2020 develops, based on a linear regression, at the growth rates observed during the periods 2001-2005, 2006-2010 and 2001-2010, respectively.

Figure 2.2 shows that if any of the three observed growth rates were continued from 2010 to 2020, the UK would easily fulfil the recycling target of 50 % by 2020. The fulfilment dates would vary from 2013 to 2015 depending on which growth rate was followed.

However, it should be noted that growth rates in total recycling reduced significantly towards the end of the measurement period. If the growth rate between 2008 and 2010 was instead used for extrapolation, the UK would not meet the 50 % recycling target until around 2017. This is nevertheless within the target period.

Should the UK begin to report on MSW more in line with definitions given in the WFD (see earlier), this is likely to bring the target fulfilment data further forward since commercial waste in general has a higher level of recycling in the UK than household waste.

Figure 2.2 Future recycling of MSW in the United Kingdom



Source: Calculation by Copenhagen Resource Institute (CRI), based on Eurostat, 2012

Please note 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. The UK has been given a four year derogation period with respect to these targets. As such the UK targets are that landfilled quantities of BMW must be reduced to 75 % of 1995 BMW by 2010, 50 % by 2013 and 35 % by 2020.

An added complication is that, as noted earlier, in October 2010 following a nationwide consultation, the UK government committed to a better alignment of MSW-reporting as used in the UK, with the EU's definition of MSW. This also had implications for the reporting of BMW diverted from landfill which would begin to include biodegradable waste from the commercial sector (Defra, 2010a). This would result in almost a doubling in waste reported as BMW (Defra, 2010b).

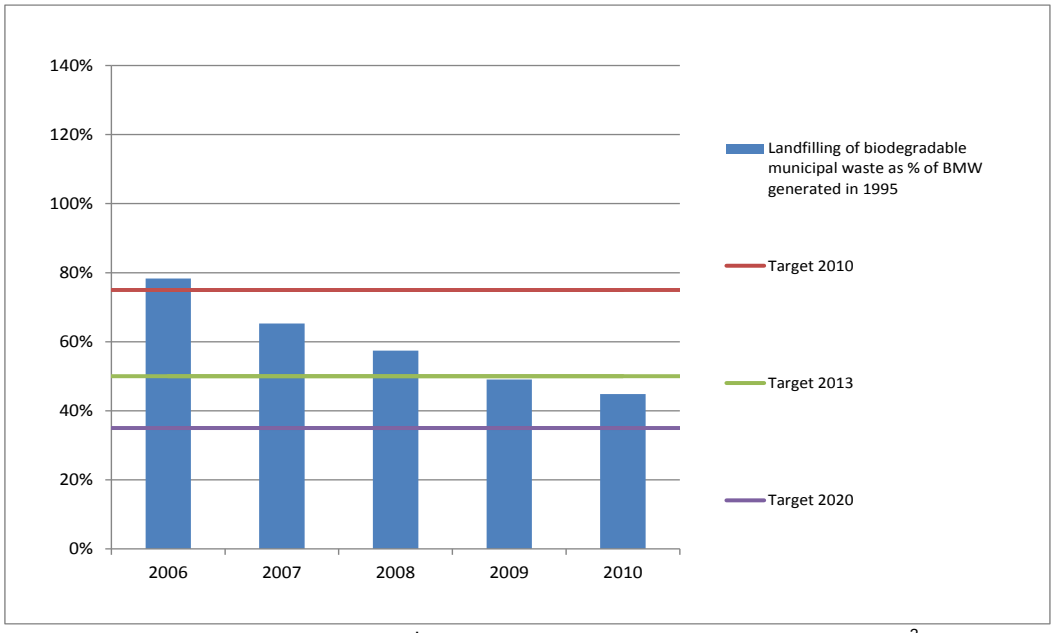
The reporting method was adjusted for the reporting year 2010 onwards – corresponding to a data year of 2007 onwards. Therefore, BMW sent to landfill in the UK as reported in 2007 (23.3 million tonnes) was 63 % higher than the figure reported for 2006 (14.3 million tonnes). This is a result of changing definitions for BMW rather than increases in the amount of biodegradable waste being landfilled.

Following the change in definition of BMW, the UK adjusted the Landfill Directive diversion targets. The old and new targets are shown in Table 1.

Table 1: Landfill Directive diversion targets according to old and revised definitions of BMW

	1995 quantity of BMW	2010 Target (75% of 1995)	2013 Target (50% of 1995)	2020 Target (35% of 1995)
UK Target for landfill of BMW under old definition (thousand tonnes)	18 260	13 695	9 130	6 391
UK Target for landfill of BMW following 2010 revision (thousand tonnes)[1]	35 688	26 766	17 844	12 491

Figure 2.3 Landfilling of biodegradable MSW in the United Kingdom



Source: EC, 2012 and own calculation*. The figures for 2010 are UK Defra estimates[2]. Note: the target dates take account of the UK's 4 year derogation period

Figure 2.3 shows that already by 2006 the UK was close to achieving the 2010 target for diversion of BMW from landfill having reduced landfilled BMW by 78 %. By 2009, the 2013 target had been exceeded suggesting that the 4 year derogation negotiated by the UK had in fact not been necessary.

The derogation was negotiated while the UK still reported using a narrower definition of municipal waste. The new reporting methods, in line with EU definitions, present a more favourable picture of progress towards Landfill Diversion targets, presumably due to a more rapid diversion of commercial wastes from landfill.

One key policy measure that may have been a major driver for achieving rapid diversion rates are the landfill allowance trading schemes (LATS) launched in England, Wales and N. Ireland in 2004 and in Scotland in 2005[3]. Allowances were allocated to each waste disposal authority at a level that would enable each region to meet its contribution to the UK targets under the Landfill Directive. Each authority had the freedom to trade allowances with other authorities according to their individual investment strategies and timescales in alternative facilities for waste (i.e. material recovery, composting or incineration). The concept was that this would allow each devolved region to meet its obligations in the most cost-effective way.

[1] According to personal correspondence on 14 June 2012 with David Lee, Waste Statistics Team Defra
[2] According to personal correspondence on 15 June 2012 with David Lee, Waste Statistics Team Defra
[3] Note that in Wales, Scotland and N. Ireland these are known as Landfill Allowance Schemes (LAS)

A 2010 consultation in England found, however, that the LATS was no longer the major driver for diversion of waste from landfills; the landfill tax escalator had overtaken the LATS as the more important driver (see later). The 2011 Waste Strategy Review for England subsequently announced plans to scrap the LATS after 2013 and to rather rely on continuing escalations in the landfill tax to continue diversion of BMW from landfill (Defra, 2012).

2.1.4 Regional differences of MSW recycling for 2001 to 2010

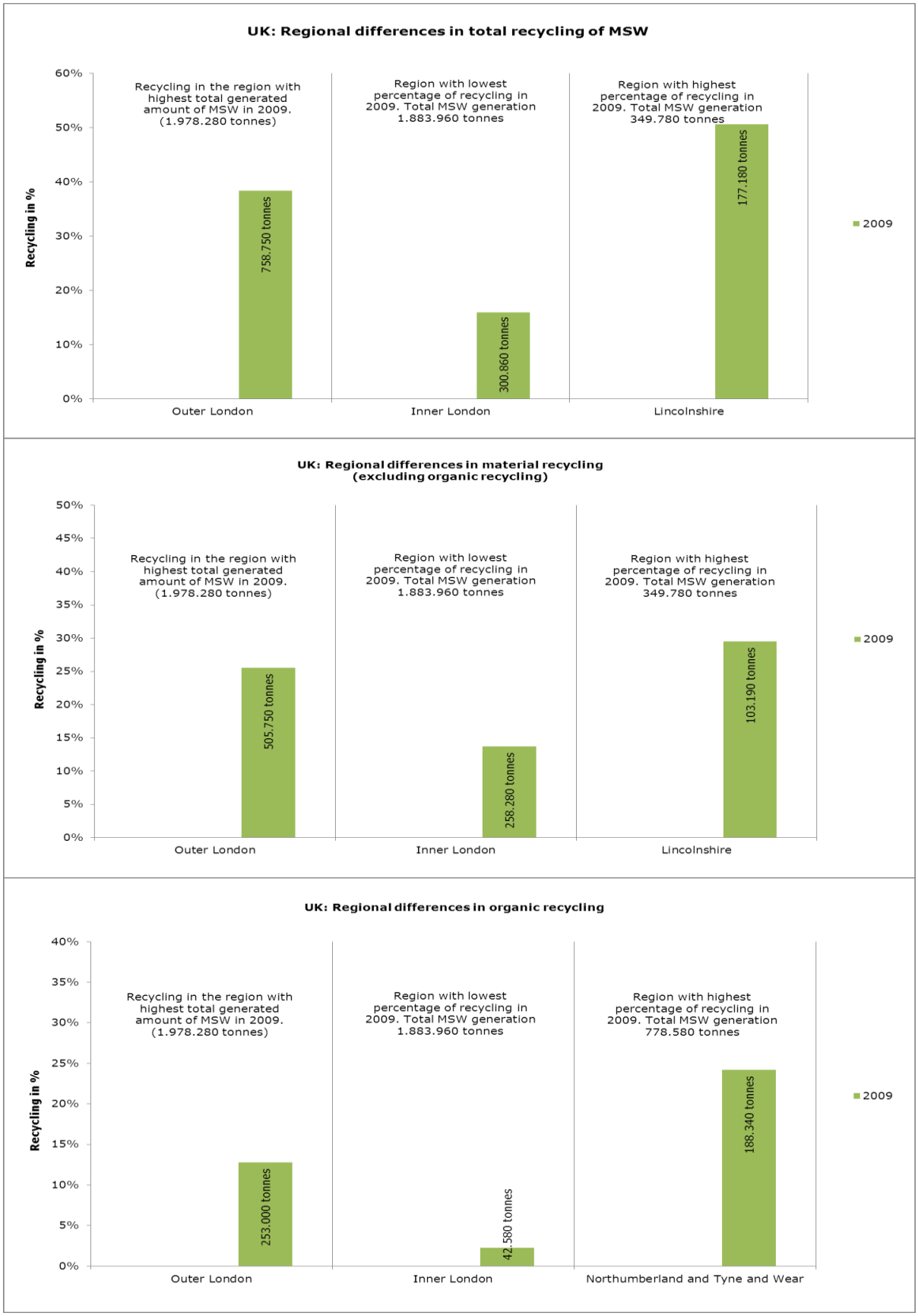
The UK has also reported to Eurostat regional recycling data of MSW. Figure 2.4 shows regional differences in the development of MSW recycling for 2009 (only year with available regional data) related to total recycling, material recycling and organic recycling. For each type of recycling three different regions have been chosen: 1) Recycling in the region with the highest total generated amount of MSW; 2) Recycling in the region with the lowest percentage of recycling, and; 3) Recycling in the region with the highest percentage of recycling.

The relevant regions are Outer London (highest generated MSW), Inner London (lowest % recycling) and Lincolnshire, a county in the Midlands (highest % recycling). These regions are all in England but data is available for all regions in the UK.

The recycling rates across regions in the UK do not present an even scatter. Inner London stands completely alone at the lower end of recycling rates. The next poorest performer, West Midlands has a total recycling rate (31 %) nearly double that of Inner London (16 %). As such the figure for Inner London can give a misleading message on recycling rates in the rest of the country. The range for all regions other than Inner London lies between 31 % in West Midlands and 51 % in Lincolnshire.

Unfortunately, Inner London is the second highest generator of MSW in the UK at 1.88 million tonnes per year in 2009 representing 6 % of total UK generation of MSW. This means that the low recycling figures in Inner London have a tendency to pull down the averages for the UK as a whole: the total recycling rates for the UK lie at 38.3 % while the average for the UK discounting Inner London would lie at 39.7 %.

2.1.5 Figure 2.4 Regional differences in recycling of MSW in the UK



Source: Eurostat regional data, 2012

It is a very low organic recycling (composting rate) that is the most important cause of the low total recycling rates for Inner London. The composting rate (2.2 %) is nearly four times lower than the next poorest performer, (North East Scotland at 8.3 %). Inner London's material recycling rates (13 %) are also the lowest in the UK, though there is a much smaller gap between there and the next lowest performer (West Midlands, 17 %).

According to a 2009 study the low levels of composting in the boroughs of Inner London results from a lack of need for collection of biodegradable waste, presumably due to a low generation of garden waste in the dense inner city areas (RSE Consulting, 2009).

However, there is a strong variation in recycling rates even within Inner London. According to the Greater London Authority (2010) there are a complex set of factors which impact on recycling performance. In particular socio-demographic make-up is a significant factor but the type of materials collected, the type of system used, container types and capacity, communications, and composition of housing stock also have a strong influence. RSE Consulting (2009) suggested that boroughs that adopted compulsory recycling saw significant increases in recycling rates.

Lincolnshire's high recycling rates have resulted from a commitment to a 55 % recycling target implemented through county-wide kerbside collection of food tins, drinks cans, aluminium foil, glass, aerosols, household batteries, paper, plastic bottles and cardboard, small electrical equipment, garden waste, textiles and clothes[4]. This is supplemented by 13 household waste recycling centres spread across the county (Lincolnshire Council, 2012).

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

The UK Landfill Tax was introduced in 1996 and was the UK's first tax with an explicit environmental focus (Seely, 2009a). The amount of tax levied is calculated according to the weight of the material disposed of and whether it is active or inactive waste. Active waste includes all biodegradable wastes including BMW.

The differential between the tax on active and inactive waste was raised dramatically since the inception of the tax. In 1996 the tax rates were GBP 7/tonne for active and GBP 2/tonne for inactive waste (Seely, 2009a). By 2012 the tax rate had been raised to GBP 64, while that for inactive waste had only been increased in line with inflation to GBP 2.50 (Quinault, 2012). The aim of this escalator has been to give a strong economic incentive to diverting biodegradable waste from landfill, rather than all wastes due to the higher environmental impacts of this waste type when sent to landfill (Seely, 2009a).

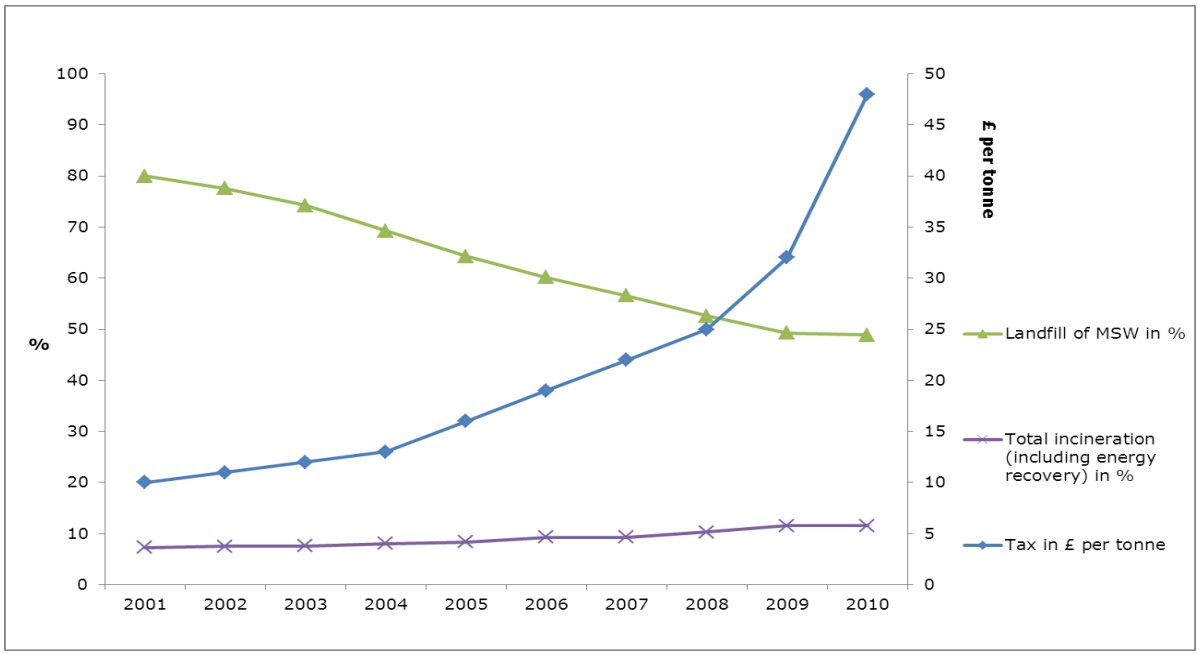
The first tax escalator (year on year increases) was announced in the 1999 budget following some individual increases in earlier budgets. The tax was to increase by GBP 1 per tonne each year until 2004 (Seely, 2009a). The escalator was increased to GBP 3 a tonne per year from 2005 and GBP 8 a tonne per year from 2007 (Seely, 2009b). In the 2010 budget the Coalition government committed to continuing with the GBP 8 escalator until at least 2014 by which time the rate for active waste will have reached GBP 80 per tonne. The concept with an escalator is that it gives local authorities and business a stable foundation on which to make long term investment decisions in alternative waste treatment plants.

The increase in the tax rates for active waste between 2001 and 2009 are presented in Figure 2.5 along with trends in the share of MSW sent to landfill. There appears to be a reasonably strong correlation between the rise in landfill tax rates and the fall in MSW sent to landfill. This correlation falls off somewhat after 2008 where despite an increase in the escalator the diversion of MSW from landfill began to tail off.

[4] http://www.northlincs.gov.uk/environment/recycling/news/

As mentioned earlier the Landfill Allowance Trade Scheme (LATS) may have been an enabling factor in allowing LAs in England as a whole to divert MSW from landfill more rapidly than the Landfill Tax would have done alone. In the 2011 Waste Policy Review, however, following a 2010 consultation, the government decided to rely on the landfill tax escalator and to phase out the LATS after 2013.

Figure 2.5 Development of landfilling and incineration of MSW and landfill tax in the United Kingdom

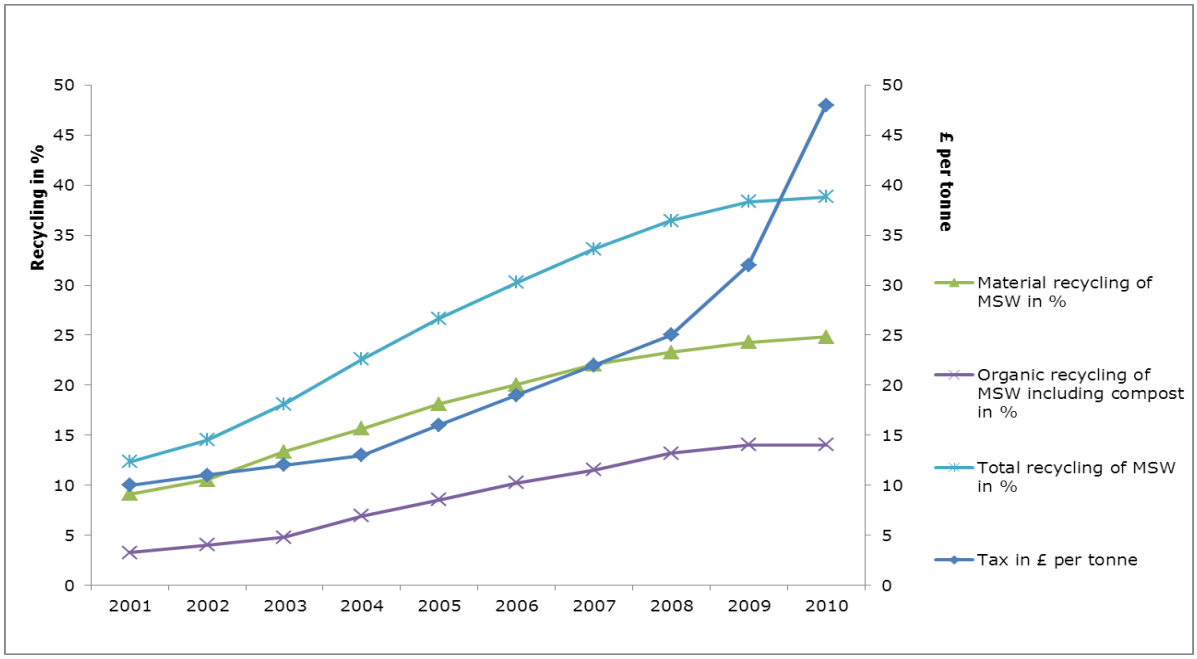


Source: ETC/SCP, 2012 and Eurostat, 2012. Note : landfill tax is shown for active waste – for inactive waste it lies at £2.50/tonne

With respect to how the diverted landfill waste is being treated, the landfill tax seems to have had most impact on recycling and organic recycling in particular, which more than quadrupled between 2001 and 2010. Growth in incineration over the same period was markedly less rapid, although still increasing by 60 %.

Growth in waste diverted to both energy and material recovery tailed off after 2008/9.

Figure 2.6 Development of MSW recycling and landfill tax in the United Kingdom



Source: ETC/SCP, 2012 and Eurostat, 2012. Note : landfill tax is shown for active waste – for inactive waste it lies at GBP 2.50/tonne

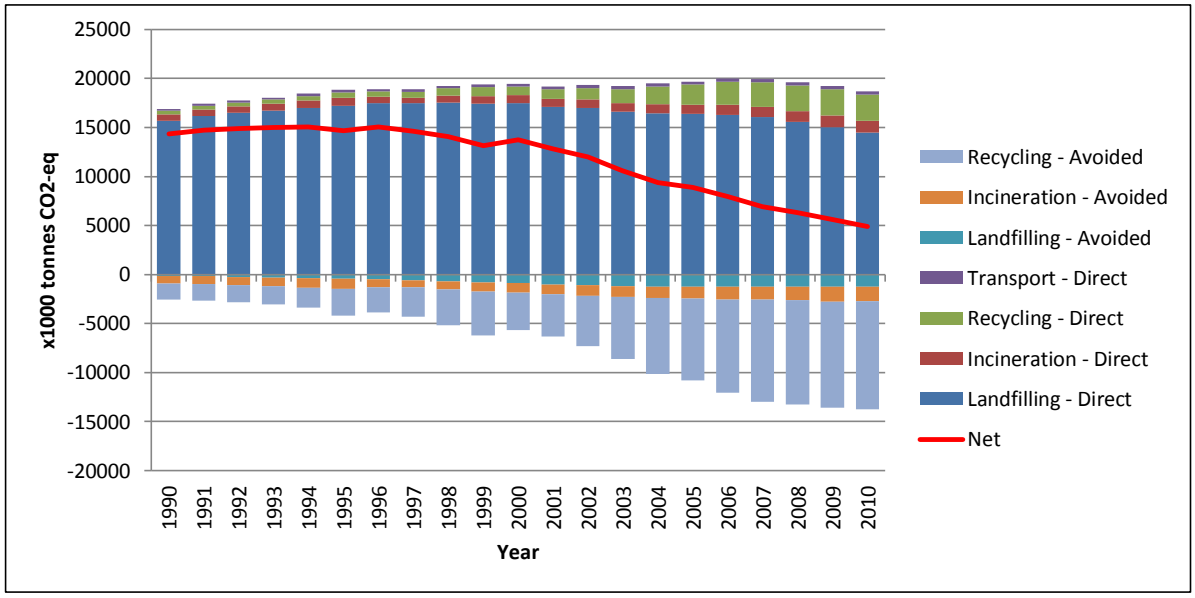
2.1.7 Environmental benefits of better MSW management

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 management[5].

Figure 2.7 shows that the direct emissions from landfilling have increased until 1999 after which they began to fall off due to sharp reductions in the quantities of biodegradable waste being sent to landfill (see earlier). It is the biodegradable waste that leads to the production and emissions of carbon dioxide and methane from landfills.

[5] 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 methodology for landfills and life cycle modelling for the other technologies (incineration, recycling, bio-treatment and transport).
For the indirect 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 bio-treatment. Avoided emissions of bio-treatment include fertiliser substitution. All processes generating electricity are assumed to substitute electricity mix of the UK in 2009. Process generating heat is assumed to substitute 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 compositions of the MSW disposed in landfills, incinerated or recycled respectively are based on ETC/SCP (2011). The complete methodology is available from ETC/SCP (2011).

Figure 2.7 GHG emissions from MSW management in the United Kingdom



At the same time due to the increases in recycling of wastes, particularly rapid after 2001, avoided emissions associated with the use of raw materials in production began to offset much of the direct emissions from landfill. This gain was partially countered by direct emissions from recycling plants which grew along with the increase in recycling, but this effect is rather small. Avoided emissions from incinerated waste (from corresponding reductions in the consumption of fossil fuels in power plants) have had a more minor effect on the overall picture, especially since much of these avoided emissions are countered by direct emissions from incineration.

The overall combined effect of these developments has been a reduction in the overall GHG emissions associated with waste management (both direct and indirect) after 1994. The reductions were particularly rapid after 2000 though have tailed off somewhat since 2008 due to a slow down in the growth of material and energy recovery from MSW (see earlier).

However, unlike many countries in the EU-27 the overall effects of treatment of MSW remains negative with respect to climate change, contributing 4.3 million tonnes CO_2-equiv. of additional emissions from the economy as a whole in 2010.

This is due to the still important role landfilling has in treatment of MSW in the UK (just under 50 % of all MSW) but also due to the large quantities of BMW that have been landfilled over the past 50 years and are still emitting GHGs. In countries with a low share of landfilling (both now and over past decades) and high rate of recycling, waste treatment has an overall positive impact on GHG emissions i.e. has an overall effect of reducing GHGs from the economy as a whole.

Seen against that background the UK has some way to go in developing a waste management industry that is a positive contributor to the climate change issue. Under current trends this is unlikely to be achieved before 2020.

2.2 Uncertainties in the reporting

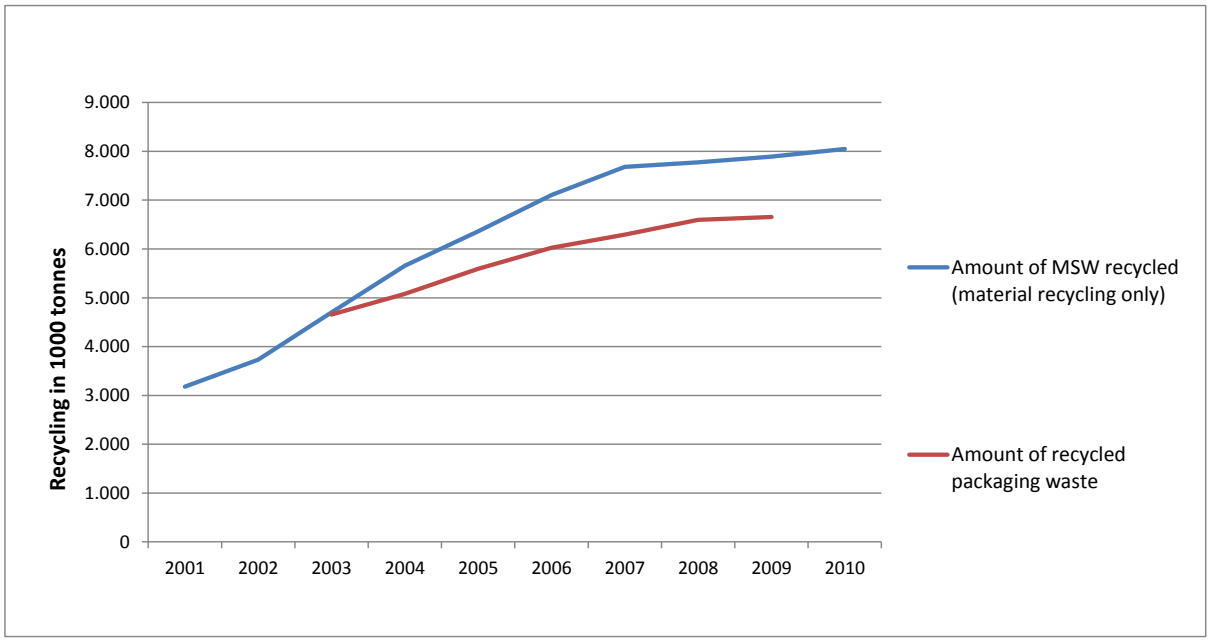
Some uncertainties or differences included in the reporting of MSW can result in different recycling levels. One example of such differences which might influence the recycling rate of MSW is to which extent packaging waste from households and similar packaging from other sources is included in the reported recycling of MSW.

Most Member Countries have producer responsibility schemes on packaging waste. Private operators of such schemes do not always report on the source of the recycled packaging waste, and packaging waste is therefore not always reported to Eurostat as MSW.

However, Figure 2.8 shows that the level of packaging waste recycled in the UK has been consistently lower than the quantity of MSW undergoing material recycling since data on packaging recycling became available in 2003. The gap has increased gradually as time progresses. This suggests that a large part of packaging waste is included in MSW reporting in the UK. It also suggests that while the majority of recycled MSW waste may have comprised packaging in the first part of the previous decade, recycling of other types of MSW is on the increase. This will include paper and newsprint and bulky waste.

It should be noted, however, that the two curves lie very close to one another particularly in 2003. This could mean that no MSW other than packaging was reported as recycled in 2003. This is unlikely as some recycling of paper and newsprint certainly existed prior to 2003. On the other hand not all packaging waste is, or should be, reported as municipal waste e.g. pallets and metal drums. Therefore, the closeness of the curves in 2003 does not necessarily imply any inconsistency in reporting.

Figure 2.8 A comparison of packaging waste and MSW recycled quantities



Source: Eurostat, 2012

Another potential factor for uncertainty in countries' reporting could be MSW sent to Mechanical Biological Treatment (MBT). In some countries, the whole amount received at the MBT plant is allocated to recycling. In others only the actual amount recycled after the MBT is included and not the amount subsequently sent to landfilling or incineration.

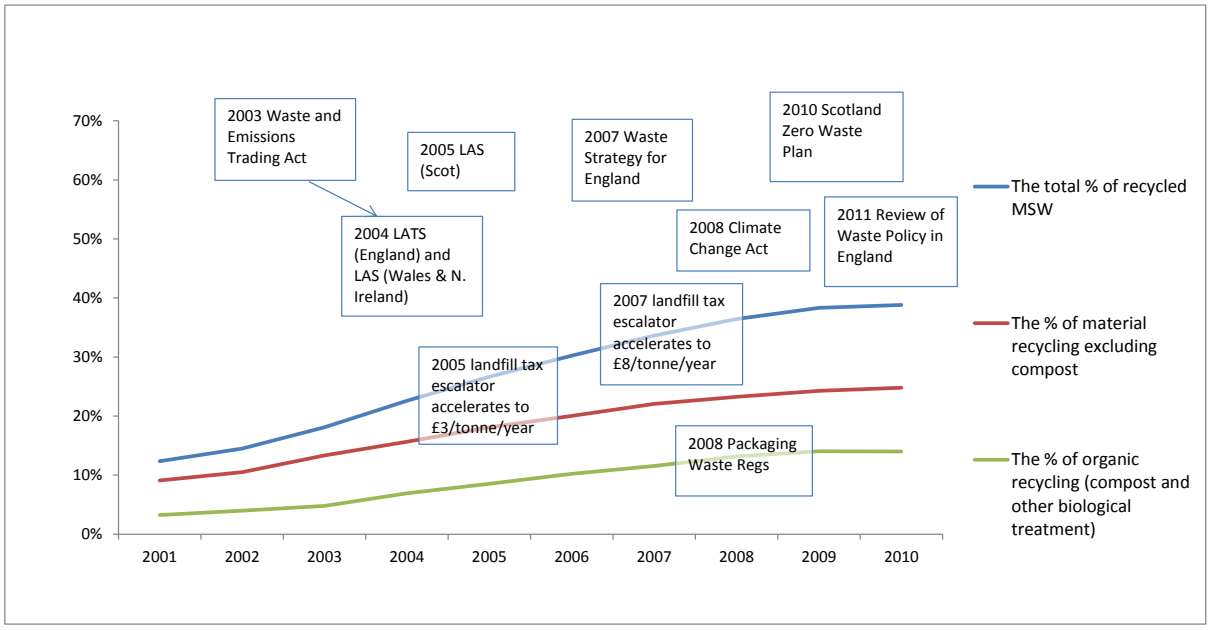
Although this treatment method has seen rapid growth in the UK in the past couple of years its share in overall waste treatment remains for the moment relatively insignificant (Steiner, 2012). Whether or not MBT is included in recycling figures will have had little effect on the overall trends presented in this report.

2.3 *Important initiatives taken to improve MSW management*

Waste policy is a devolved matter in the UK. The administrations of Scotland, Wales and Northern Ireland are responsible for strategy and policy relating to waste management in those regions.

Despite differences in the specifics of policy measures, national priorities for waste as set by the various waste strategies of the devolved regions, have been consistent in aiming to drive action further up the waste hierarchy, thus making a transition from landfill of waste, towards prevention, recycling, re-use and energy recovery, along with a reduction of GHG emissions from waste management.

Figure 2.9 Recycling of MSW in UK and important policy initiatives



Source of data: Eurostat, 2012. Note: all figures are shown as % of generated MSW

In general successive waste strategies in each region (2000 Waste Strategy in England & Wales; 2007 Waste Strategy, England; 2009 Towards Zero Waste Strategy, Wales, 2010 Zero Waste Strategy, Scotland, 2006 Waste Management Strategy, N. Ireland) have tended to establish increasingly ambitious targets for recycling of household and municipal waste, and for diversion of waste from landfills.

A number of initiatives have been developed to meet these targets during the past decade. As has been typical for the UK approach to solving environmental problems in recent years, many of these initiatives comprise economic instruments.

As described in Section 2.1.5, the Landfill Tax established in 1996 has been a key driver in the diversion of waste from landfills and towards energy and material recovery. The impact of this driver, initially low, was strengthened by the adoption of regular increases (known as an escalator) in the charge rate for active wastes. The escalator was accelerated to GBP 3 per tonne per year rise in 2005, followed by a sharper increase of GBP 8 per tonne/year in 2007 which is set to continue to at least 2014. The predictable nature of the increases in the tax rates provides a firm foundation for local authorities (LAs) and waste treatment businesses to make low-risk investments in recycling, composting and incineration facilities.

Another milestone initiative was the passing of the Waste and Emissions Trading Act in 2003 in the UK, which established a legal basis for the creation of landfill allowance trading schemes (LATS) in

the devolved regions in 2004 (England, Wales and N. Ireland) and 2005 (Scotland). The aim of the schemes were to allow the targets for diversion from landfill to be met more cost-effectively by giving LA the flexibility to buy, bank or sell their own allowances to other LAs depending on their current and future planned capacity for recycling facilities. As noted earlier, a consultation in England in 2010 identified that the LATS scheme there was no longer a key driver in meeting landfill diversion targets and will be phased out in England after 2013.

The recycling of packaging waste has been driven by the Producer Responsibility (Packaging Waste) Regulations since 1997 in Great Britain and since 1999 in N. Ireland. This places a burden of responsibility on large companies producing, selling or importing packaging to pay for subsequent recovery and recycling of an appropriate volume of packaging wastes as determined by targets for packaging waste recycling as transposed from the Packaging Waste Directive.

Payment is made via purchases of so-called Packaging Recovery Notes (PRNs) from recycling businesses. The price of PRNs is set by market forces, thus creating a market for packaging wastes. The UK has met its targets relatively easily as evidenced by the low price of PRNs (Franckx et al, 2008). This is likely to be due in part to the important export market for packaging waste principally to China which has been a further important, non-policy based driver for increases in recycling.

A driver for energy recovery from MSW has been the market for Renewable Obligation Certificates (ROCs) established by the Renewable Obligation Orders of 2002, 2003 and 2005. Under these orders distributors of electricity are required to deliver an increasing percentage of electricity from renewable sources. They 'buy' renewable electricity via purchasing ROCs from renewable electricity generators. These can include incineration and anaerobic waste composting facilities. The majority of waste managers do not believe that the market for ROCs and the UK's renewable energy targets have been a major driver for increasing recovery of waste in the UK (Norton Rose Group and Tolvik Consulting, 2011).

An economic instrument which can be used to encourage waste separation by households is 'pay-as-you-throw' charging for the collection of non-separated wastes, according to the amount of waste. This has, to date, not been used in the UK. The previous UK government opened the door for piloting such a scheme in up to five local authorities in the 2008 Climate Change Act. No LAs took this opportunity, however (BBC, 2010). The Coalition government ruled out further support to such schemes in 2010, favouring instead recycling reward schemes.

An important non-market-based initiative contributing to increasing recycling rates for MSW in the UK was the establishment of WRAP UK in 2001, in response to the 2000 Waste Strategy for England and Wales. WRAP is an enabling organisation whose core activity is establishing voluntary partnerships between producers and recyclers of waste, and between them and users of products containing recycled materials. One example of a WRAP initiative is the Cortauld Commitment, a voluntary agreement for retailers to engage them in reducing food waste and optimising the use and recycling of packaging.

2.4 Future possible trends

As mentioned above UK has a four year derogation period for fulfilling the targets in the Landfill Directive. The UK had already met its 2013 Landfill Directive target by 2009 implying that UK has achieved the targets in the Landfill Directive without using the derogation period. At current rates in landfill diversion the UK ought to meet the 2020 target with current initiatives particularly if the landfill tax escalator is continued after 2014.

It also appears that at growth rates in MSW recycling observed during the first decade of the century that the UK should meet the 2020 target for 50 % of MSW recycling. However, the slow down in MSW recycling growth between 2009 and 2010 might need to be tackled through additional initiatives.

One remaining doubt is whether austerity measures imposed on local budgets since the economic crisis will impact on Local Authorities' abilities to provide separate kerbside collection facilities in the future.

A countrywide survey of waste management company CEOs found a fairly high level of confidence that the 50 % MSW recycling target would be met by 2020, slightly lower confidence about meeting the UK's 2020 Landfill Directive target. This is in part due to doubts over whether there is sufficient time available to invest in and build the necessary recycling and recovery facilities for organic wastes, especially given the current pressure on local authority budgets (Norton Rose Group & Tolvik Consulting, 2011). Some expressed concern that the low hanging fruits had already been plucked and that growth rates for recycling and landfill diversion would be lower in the future.

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