Country fact sheet

Municipal waste management

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Poland

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European Topic Centre on Waste and
Materials in a Green Economy

Context

This country profile was prepared within the EEA's work on municipal waste, resulting in the following outcomes:

- 32 country profiles (this document) – The country profiles were originally produced by the ETC/SCP and were published by the EEA in 2013. The ETC/WMGE updated them for the EEA under its 2015 and 2016 work programme.

- An EEA briefing on Municipal waste management across European countries

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Related country profiles

Country information on waste prevention programmes can be found at:
http://www.eea.europa.eu/publications/waste-prevention-in-europe-2015

For country profiles on material resource efficiency policies, please visit:
http://www.eea.europa.eu/publications/more-from-less/

Contents

Highlights

- Recycling has increased from 4 % of the generated municipal waste (MSW) generated in 2001 to 32 % in 2014. According to the National Waste Management Plan 2022, preparing for re-use and recycling of four fractions of municipal waste achieved in 2014 was 26 %;
- Until 2009, the increase was primarily linked to material recycling, whereas a significant increase in organic waste recycling has taken place in 2009–2014;
- Poland only includes recycling of packaging waste from households to a limited extent in its reporting of MSW recycling;
- Poland will need to speed up its efforts in order to meet the EU requirement on 50 % MSW recycling in 2020;
- The 2010 target for biodegradable municipal waste sent to landfill was not met but the 2013 target was achieved and the 2020 target is also likely to be met;
- An increased landfill tax (fee) has been an important policy initiative in diverting MSW away from landfill;
- In 2013, the responsibility for collection and management of MSW has been given to municipalities, which are better placed to improve the level of MSW recycling.

1 Introduction

1.1 Objective

Based on historical municipal waste (MSW) data for Poland and EU targets linked to MSW in the Waste Framework Directive (WFD), the Landfill Directive and the Packaging Directive, 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;
- indicators relating to the country's most important initiatives for improving MSW management;
- future possible trends.

2 Poland's municipal waste management performance

Poland had been preparing itself to fulfil EU waste requirements for several years before it joined the EU in 2004. The first Polish Law on Waste Management was enacted in June 1997, and came into force on 1 January 1998. On 1 October 2001, a new Act came into force which introduced the waste hierarchy, the proximity principle and the principle of extended producer responsibility as its basis, along with new requirements for waste generators and actors involved in waste management activities (Tojo, 2008). The Act was replaced in 2012 by the Waste Act that incorporated the EU WFD and the already previously transposed Landfill Directive. A new Act on Packaging and Packaging Waste Management updated previous related legislation in 2013 (OECD, 2015).

Another important act on maintaining cleanliness and order in municipalities was passed in September 1996 and came into force on 1 January 1997. An amendment to this act of 2011 made municipalities the owners of MSW generated within their jurisdiction and new provisions after a transitional period came fully into force in July 2013. Furthermore, the amendment required municipalities to organise separate collection of recyclables and to set up and start to collect fees from households and from the service sector to cover the full costs of municipal waste collection and treatment. These were significant changes in the waste administration as well as in practical procedures related to municipal waste management in Poland (OECD, 2015).

In 2002, the first National Waste Management Plan (NWMP) was approved for the years 2002–2006. The second plan, which covered 2007–2010, was approved in 2006 (Poland, 2006), and the third plan, covering 2011–2014, was approved in 2010 (Poland, 2010a). The NWMP 2014 includes a perspective for 2015–2022. According to the Polish legislation, a new plan must be in place by the end of 2016. The National Waste Management Plan 2022 (NWMP 2022) was adopted by the Council of Ministers on 1st July 2016 and entered into force on 12th August 2016 (Polish Ministry of the Environment, 2016).

The Ministry of the Environment (MoE) has primary responsibility for drawing up national policies and plans, preparing legislation and monitoring policy implementation in almost all environmental

areas, including waste. The Ministry of Economy (since November 2015 the Ministry of Economic Development) supports the MoE in preparations to implement regulations on waste and other ministries are involved in regulating specific waste types. The administrations of the 16 viovodeships[1] prepare voivodeship waste management plans and issue most permits for waste treatment. As of 2013, the responsibility for municipal waste management was given to municipalities. Collaboration between municipalities is encouraged and 123 waste regions for joint management of MSW facilities were designated (based on voivodeship waste management plans prepared before the preparation of the NWMP 2014) but the number of regions was reduced to 89 in the framework of updating voivodeship waste management plans in 2012. The number has been 88 since 1 January 2016 due to the fusion of two regions into the Kujawsko-Pomorskie voivodeship. Overall monitoring and enforcement of municipal waste management is the responsibility of municipalities and voivodeship inspectorates for environmental protection. Financial penalties are applied to municipalities not implementing national regulations or for a lack of compliance with the municipal waste targets. These are imposed by voivodeship inspectorates for environmental protection (Polish Ministry of the Environment, 2015).

Households pay their waste management fees to municipalities, which then pay the waste collection companies they have contracted. According to Polish legislation, municipalities may base fees either on the number of people per household, the area of the house or water consumption. No pay-as-you-throw (PAYT) systems are currently in place for municipal waste collected from households (OECD, 2015; Gibbs *et al.*, 2014).

Both private and municipally-owned companies operate in municipal waste management in Poland. There are extended producer responsibility schemes in place, and producer responsibility organisations organise the management of some waste streams, such as packaging waste and waste electrical and electronic equipment (WEEE). After collection by municipal or private collection companies packaging waste is often pre-sorted and then sold to recycling facilities. The recycling facility issues a receipt, which in turn is refunded by the EPR scheme. (OECD, 2015; Gibbs *et al.*, 2014)

Residual (mixed) waste is typically collected by door-to-door collection. Source separated recyclables are gathered by collection point systems or comingled door-to-door collection. Some municipalities have additionally introduced separate collection of bio-waste and there is a deposit system in place for refillable bottles. In 2013 there were 1 689 civic amenity sites in Poland and the number increased to 1 871 in 2014. Since the introduction of new management systems in municipalities, formal municipal waste management covers 100 % of generated municipal waste (NWMP 2022).

In 2014 residual municipal waste was treated at 127 mechanical biological treatment (MBT) facilities. Recognised as regional installations for municipal waste treatment, the total capacity of the mechanical parts of these installations was 9.4 million tonnes and of the biological parts 4.1 million tonnes, respectively. Some waste is sorted for recycling and for co-incineration in cement kiln. Most MBT plants use bio-stabilisation and their output, after treatment, is directed to landfill. There is one incineration plant in operation in Poland with an annual capacity of 42 000 tonnes and co-incineration capacity is available for high-calorie fractions of MSW in cement plants. Total landfill capacity for non-hazardous and inert waste is 69.55 million tonnes. There are 97 plants for biological treatment of green waste and other biowaste, with a total annual capacity of ca. 870 000 tonnes, as well as capacity for recycling of paper, ferrous metals and glass waste (Polish Ministry of the Environment, 2015 and 2016; NWMP 2022; Arcadis, 2014; Gibbs et al., 2014).

[1] A voivodeship is the highest-level administrative subdivision of Poland (regions).

In 2007, the generation of MSW in Poland exceeded 12.2 million tonnes but since then there has been a constant decrease to 10.3 million tonnes in 2014 (Eurostat, 2016). According to the reporting to Eurostat, for the period 2001–2014, 77–100 % of generated waste has been treated ([2]). In 2014, the reported treated amount accounted for 100 % of the reported generated amount – 10.3 million tonnes based on an estimation methodology (Eurostat, 2016; Polish Ministry of the Environment, 2015).

2.1 Municipal waste indicators

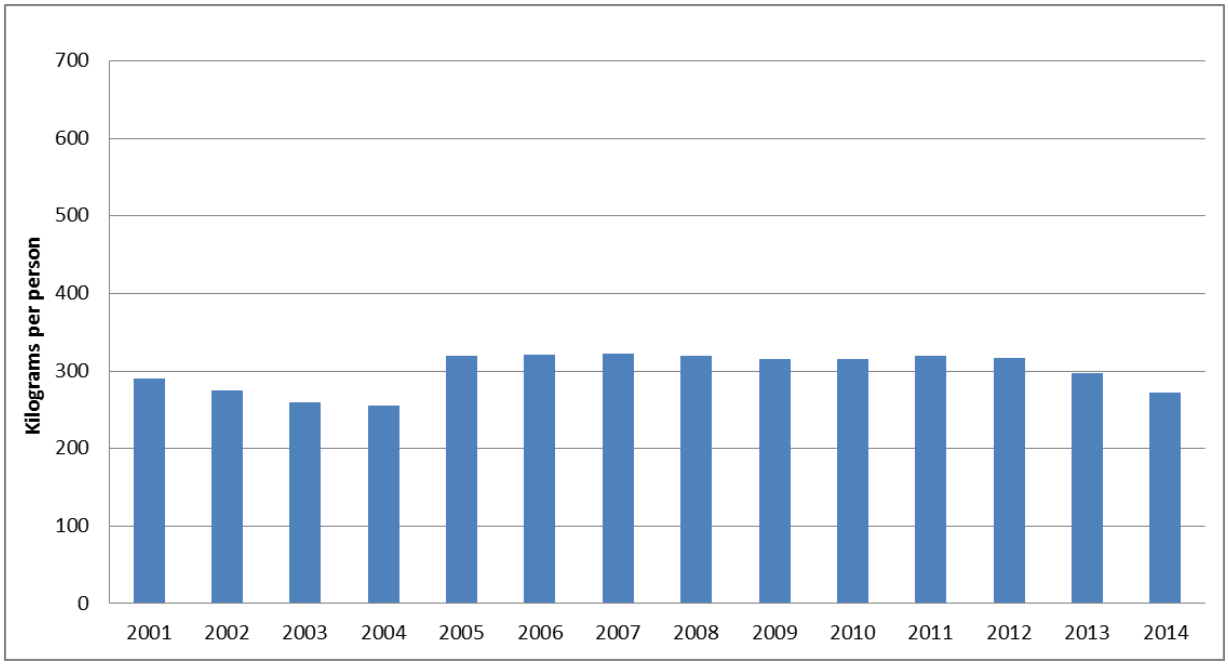
The following indicators illustrate the development of the Polish MSW management in the period 2001-2014. All percentage figures have been calculated by relating the waste managed to the amount generated – not the amount treated. Relating to the total managed amount of MSW would generally result in higher rates for all waste management paths.

Figure 2.0 shows the development of MSW generation per person in Poland for 2001–2014. There has been a decrease, from 290 kilograms in 2001 to 256 kilograms in 2004. From 2004 to 2005 there was an increase from 256 kilograms per person to 319 kilograms, which can be explained by a change in the reporting methodology (Section 2.2). From 2005 to 2012, generation was quite stable, but in 2013 and 2014 there was a slight decline.

([2]) Treatment rates are dependent on several factors:

- waste undergoing MBT treatment loses mass, and as only post-treatment amounts are to be reported to Eurostat, the waste treatment amounts might be lower than those generated and collected;
- some countries estimate waste generation based on population, common where the collection coverage is less than 100 %, while treated amounts are based on waste delivered to waste facilities.

Figure 2.0 Poland, municipal waste generation per person, 2001–2014



Source: Eurostat, 2016.
Note: data collection methodology was changed in 2005. Until 2004, the generated MSW only covered the collected MSW. Since 2005, the municipal waste generated but not covered by the waste collection schemes is estimated based on administrative data.

The majority of MSW in Poland is still landfilled. In 2014, the figure was 5.4 million tonnes compared to 10.6 million tonnes in 2001.

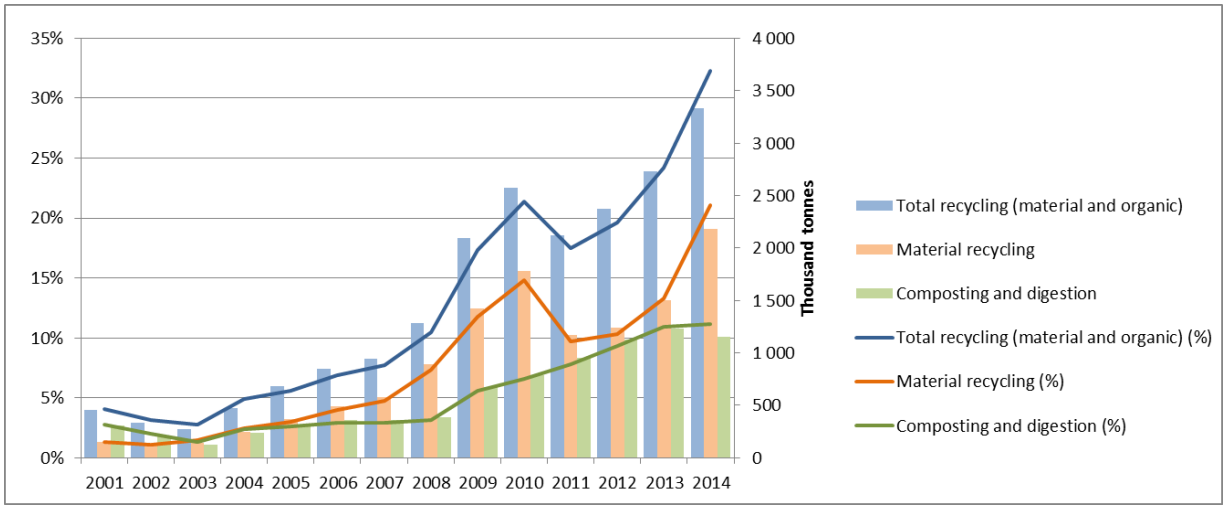
2.1.1 Municipal waste recycling, 2001–2014

Figure 2.1 shows the development of MSW recycling in Poland related to total recycling, material recycling and organic recycling (composting and other biological treatment). Figure 2.2 illustrates a positive trend in the recycling of MSW since 2003; total recycling increased from 4.9 % of MSW in 2004 to 32 % in 2014.

The percentage increase is in fact larger than stated. The recycling figures up to 2004 were calculated by relating the reported amounts of recycling to the collected amounts. From 2005 onwards, the percentages have been calculated by relating the recycling amounts to the larger generated amounts of MSW.

The total increase of recycling up to 2009 is primarily linked to material recycling which has increased from 2.5 % in 2004 to 21 % in 2014 – or, in absolute terms, from 243 000 tonnes to 2.2 million tonnes. In 2009–2014, there was a significant increasing trend in organic recycling from 5.6 % to 11.2 % – an increase from 672 000 tonnes to 1.2 million tonnes.

Figure 2.1 Recycling of municipal waste in Poland, 2001–2014, per cent and tonnes



Source: Eurostat, 2016.
Note: the percentages reflect the recycling rate of generated MSW in the period 2005–2014, and of collected MSW in the period 2001–2004.

The Polish authorities have given the following information on the drop in material recycling and increase in composting from 2010 to 2011, "*the increase in the amounts of waste composted and the subsequent fall in the amounts of waste recycled from 2010 to 2011 is a result of the change in the reporting form, introducing MBT operations and the approach to the allocation of the output streams of MBT facilities to* 'MW composted or fermented'. *Splitting the amounts of municipal waste allocated to the MBT operations between the four categories is not yet possible due to the construction of reporting form. It should be possible, starting from the reference year 2014"* (Eurostat, 2015d). According to the information from the Central Statistical Office of Poland, the introduction of the M-09 reporting form allows the allocation of the output streams of MBT facilities to the three possible final treatment categories. Previously it was allocated to *'MW composted or fermented'* (Polish Ministry of the Environment, 2015).

The EU's 2008 WFD includes a target for (certain fractions of) MSW: 'by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households shall be increased to a minimum of overall 50 % by weight'. EU Member States may choose between four different methodologies to calculate compliance with the target[3]. Poland has chosen calculation method 2 (Gibbs *et al.*, 2014) and has reported a recycling rate of 18 % according to this methodology for the year 2012, 22% for 2013 and 26% for 2014 (NWMP 2022). The recycling rates shown in this paper correspond to method 4, the only method for which longer time series data

[3] Commission Decision 2011/753/EU allows countries 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:

1. paper, metal, plastic and glass household waste;
2. paper, metal, plastic, glass household waste and other single types of household waste or of similar waste from other origins;
3. household waste;
4. municipal waste (the method used in this document).

exist. In 2015, the European Commission has proposed new targets for municipal waste of 60 % recycling and preparing for reuse by 2025 and 65 % by 2030, based on only one calculation method, and with the option of time derogations for some countries (EC, 2015).

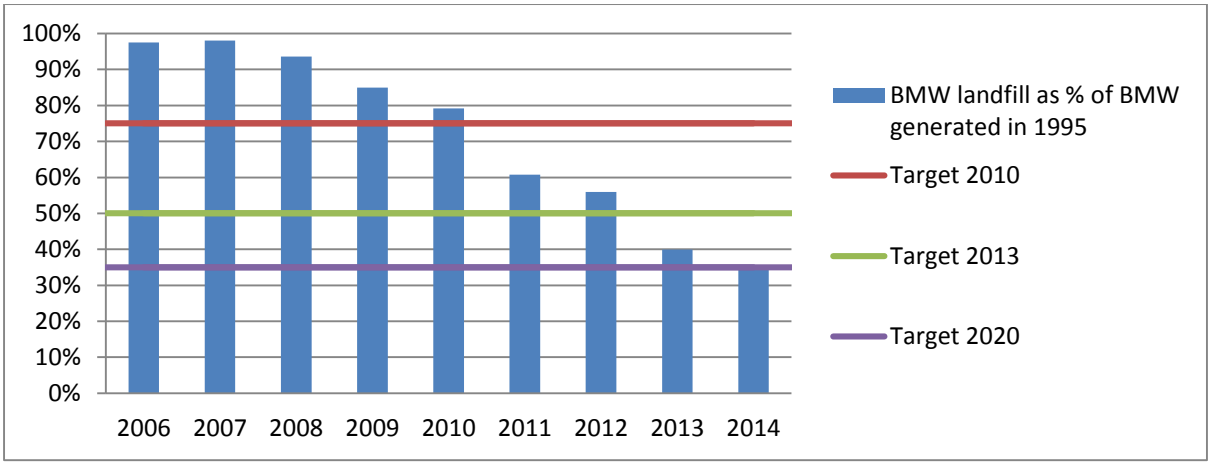
Poland will have to increase the recycling rate by 26 percentage points in the period 2014-2020 according to calculation method 2, corresponding to 4.3 percentage points per year, a little above the achieved increase of 4 percentage points annually in the period 2012–2014. Poland will thus have to continue the positive development achieved in the past few years in order to meet the target.

2.1.2 Landfill of biodegradable municipal waste

It is a general requirement of the EU Landfill Directive that all Member States have to reduce the amount of biodegradable municipal waste landfilled (BMW) by a specific percentage by 2006, 2009 and 2016. Poland has, however, been given a four-year derogation period. The targets are related to the amount of BMW generated in 1995, 4.38 million tonnes in Poland.

Poland has reported its landfilled amount of BMW to the European Commission for the years 2006, 2007, 2008 and 2010. In addition, data for 2009 and 2011–2014 has been provided by the Polish Ministry of the Environment (2015).

Figure 2.2 Poland, landfill of biodegradable municipal waste, 2006–2014



Source: Polish Ministry of the Environment, 2016 (data for 2007–2014); EC, 2014 (data for 2006).
Note: The target dates take account of Poland's 4-year derogation period.

In 2008, the landfilled amount was 4.1 million tonnes, equivalent to 94 % of the generated amount in 1995. Figure 2.2 shows little reduction in the percentage of BMW landfilled in Poland up to 2008, relative to 1995. One explanation for the missing reduction is that the amount of BMW generated increased from 4.4 million tonnes in 1995 to 6.6 million tonnes in 2008 (Poland, 2010b).

Since 2008 the landfill of BMW, as share of generated BMW in 1995, has decreased considerably – to 40 % and 35 % in 2013 and 2014 respectively, meaning the early achievement of the targets for 2013 and 2020 (NMWP 2022).

2.1.3 Regional differences of municipal waste recycling, 2001–2013

Poland has reported regional MSW recycling data to Eurostat.

The most populated regions in Poland include Mazowieckie, with 5.3 million out of the total 38 million inhabitants) that covers the capital region; Slaskie, 4.5 million; Wielkopolskie, 3.4 million;

and Malopolskie, 3.3 million. In the other regions the population ranges from 0.96 to 2.9 million inhabitants (Eurostat, 2015c).

The MSW generation in both Mazowieckie and Slaskie in 2013 was about 1.6 million tonnes representing together some 28 % of MSW generated in the country, while the Wielkopolskie region generated around 10 % of the country's municipal waste (Eurostat, 2015a).

Mazowieckie is also by far the most economically developed region of the country: its gross domestic product (GDP) per person in 2013 was 62 % of the EU average, while the other regions' figures reached between 27 % and 42 % of the EU average in Lubelskie and Slaskie respectively (Eurostat, 2015b).

Map 2.1 shows regional differences in the MSW recycling for 2013, the latest year with available regional data, related to total recycling.

Map 2.1 Poland, regional differences in municipal waste recycling, 2013

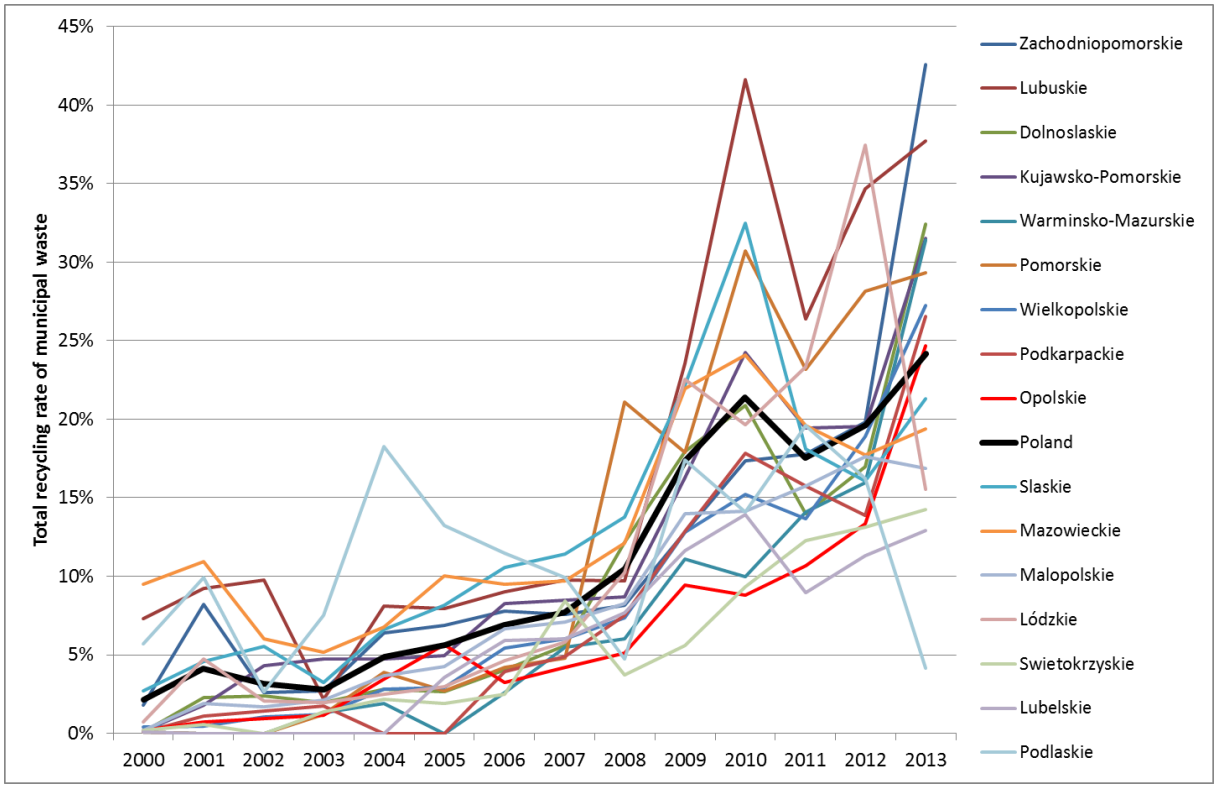
Source: Eurostat, 2015a.

The total recycling rate ranged from 4 % to 43 % between the regions in 2013 while the national average was 24 %.

Figure 2.3 shows regional differences in the development of MSW recycling for 2001–2013 relative to total recycling (the sum of material and organic recycling) based on data reported to Eurostat.

For most regions, the trend in recycling is increasing in accordance with the national development. In the highly populated Mazowieckie and Slaskie regions, the recycling rates have been slightly lower than the national average in the recent years. In general, it can be said that the data highlight some abrupt changes over the years. For the years until 2005, this can be explained by the decrease of collected MSW as previously mentioned (Section 2.2). The data appears more stable from 2005. The decrease of recycling rates between 2010 and 2011 can at least partly be explained by a change in accounting for MSW treated in MBT plants from 2011 onwards. From 2012 onwards MBT outputs are generally allocated to recycling, incineration and landfilling.

Figure 2.3 Poland; regional differences in recycling of municipal waste, 2000–2013



Source: Eurostat, 2015a.
Note: the percentages reflect the recycling rate of generated MSW in 2005–2013, and of collected MSW in 2001–2004.

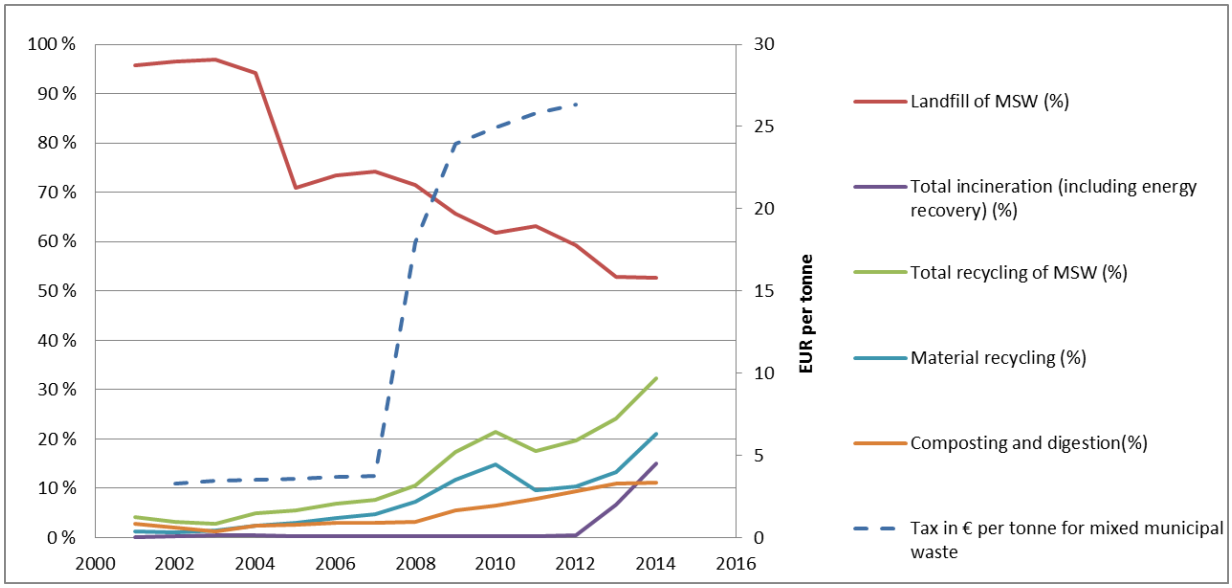
2.1.4 Recycling and landfill taxes

First elements of a landfill fee system were introduced in the 1970's – for waste from the mining industry. The system has expanded over the years and in 2002 the last group of waste, municipal waste, was included in the system. The landfill fee is passed on to national, 14 % and voivodeship,

26 %, funds for environmental protection and water management, and to poviat[4], 10 %, and municipal, 50 %, budgets. Revenues are used exclusively for investment in environmental protection and water management (Polish Ministry of the Environment, 2015).

The landfill tax, called a fee in Poland because it is not a typical tax, is paid by the landfill operator and there were more than 20 different rates in existence in 2010 (Malecki, 2010). In general, the rates increase annually with inflation, with the exception of 2008 and 2009 when the fee was increased significantly through regulations of the Council of Ministers, adopted in 2007 and 2008, respectively (Polish Ministry of the Environment, 2016) (Figure 2.4).

Figure 2.4 Poland, landfill tax and municipal waste management, 2001–2014, per cent and EUR per tonne



Source: Eurostat, 2016 ; ETC/SCP, 2012.
Note: the percentages reflect the recycling rate of generated MSW in the period 2005–2014, and of collected MSW in the period 2001–2004.

It has to be stressed that the generation of MSW before 2005 is equal to the collected amount – and not the real generated amount. Figure 2.4, however, clearly shows the effect of the fee: when the fee was raised in 2008 the amount of landfilled MSW dropped from 74 % in 2007 to 71 % in 2008 and 66 % in 2009 (Eurostat, 2016; Malecki, 2010).

The landfill fee seems to have had little impact on the incineration of MSW. Figure 2.4, however, shows that the significant increase of the landfill fee for MSW is reflected in an increase of total recycling of MSW as well as material recycling and to a lesser extent of organic recycling.

2.1.5 Environmental benefits of better municipal waste management

Figure 2.5 shows a scenario for the development of greenhouse gas emissions from MSW management in Poland. The scenario assumes a yearly increase of 0.6 % for municipal waste generation for the years 2011–2020 and that the EU targets for municipal waste are fully

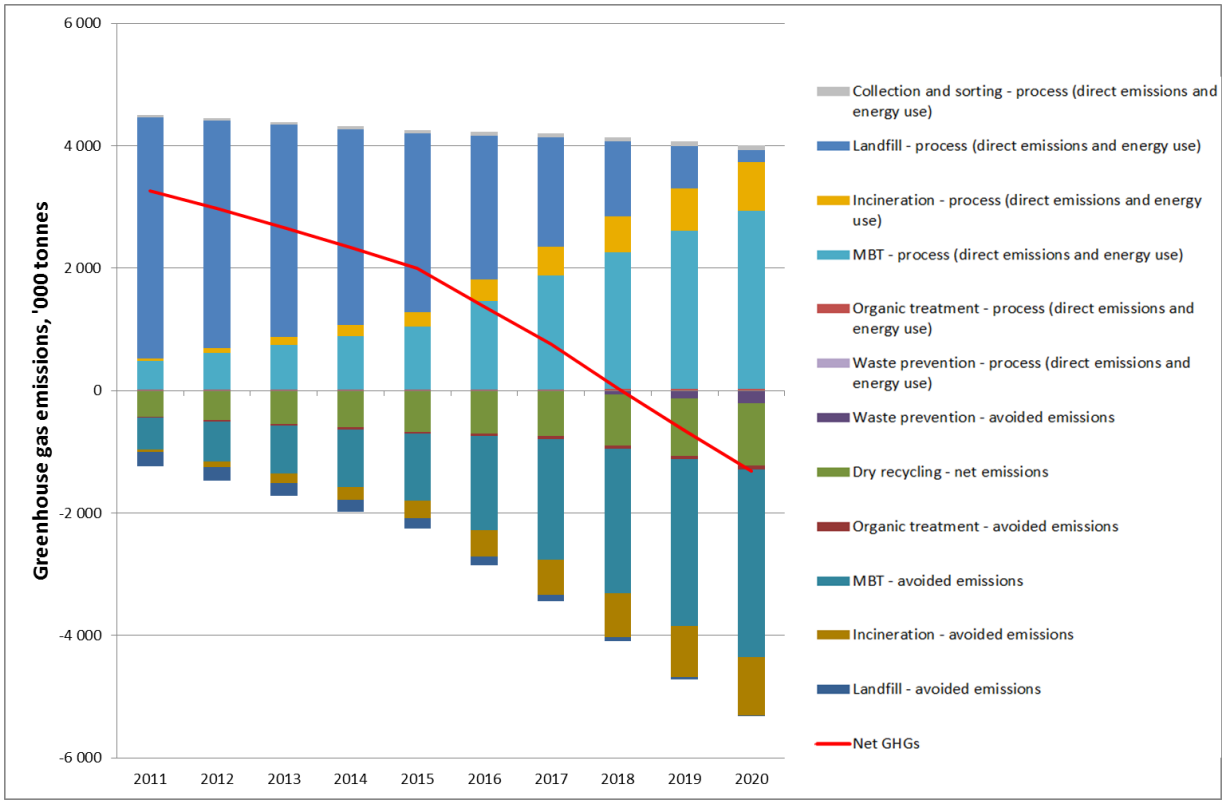
[4] Poviats are the second-level units of local government and administration in Poland

implemented. The scenario assumes that in 2020, 32% of municipal waste is recycled, 62% incinerated, and 6% landfilled (after any pre-treatment operations). The calculation of emissions is based on data and assumptions contained in the European Reference Model on Municipal Waste Generation and Management. The approach taken in the model is rooted in life-cycle thinking, in that it considers not only direct emissions, but also avoided emissions associated with the recycling of materials, or the generation of energy by waste management processes. The more detailed methodology is described in Gibbs *et al.* (2014a). The level of greenhouse gas emissions depends on the amount of waste generated and the treatment it undergoes each year.

Figure 2.5 shows direct emissions, avoided emissions and net emissions of the MSW management. All the greenhouse gas emissions (positive values) represent the direct operating emissions for each waste management option. The phases of the waste management chain covered include waste prevention; material recycling; composting and anaerobic digestion; MBT and related technologies; collection and sorting; incineration and landfilling.

For avoided emissions (negative values), the calculations integrate the benefits associated with the recovery of energy and material recycling of paper, glass, metals, plastics, textiles and wood, and bio-treatment of food and garden waste from the MSW. (Gibbs *et al.*, 2014b)

Figure 2.5 Poland, scenario for greenhouse gas emissions from municipal waste management, 2011–2020



Source: ETC/WMGE, calculation based on the European Reference Model on Waste.

Note: results presented in this figure should not be used for the compilation of greenhouse gas reporting to the Intergovernmental Panel on Climate Change (IPCC) national inventory report, or be compared with IPCC figures, as the methodology employed here relies on life-cycle thinking and, by definition, differs substantially from the IPCC methodology.

MBT means mechanical-biological treatment.

Based on the modelled scenario with full policy implementation, net greenhouse gas emissions from the treatment of municipal waste in Poland are expected to decrease in the period 2011–2020 and to show a small net saving in 2020 when the benefits of better waste management are expected to be higher than the direct emissions from collection and treatment operations. In the first modelled years of the scenario, the direct greenhouse gas emissions related to municipal waste management are linked almost exclusively to landfilling.

Greenhouse gas emissions from landfill are caused by the breakdown of organic wastes accumulated over past decades. In the model, which calculates landfill impacts over a 100-year period, the longer-term emissions from any given waste are attributed to the year in which that waste is deposited (Gibbs *et al.*, 2014a). Therefore, the positive effect of diverting BMW from landfill shows in the figures as an immediate reduction in greenhouse gas emissions from landfill. According to the model, towards 2020 the greenhouse emissions of waste management in Poland will mainly originate from MBT processes and waste incineration.

2.2 Uncertainties in the reporting

Some uncertainties or differences in how countries report MSW recycling can result in different recycling levels. This applies, for example, to the following issues:

- the extent of packaging waste from households and similar packaging from other sources that are included or not included in the reported recycling of MSW;
- the definition of municipal waste used by the country, for example, the inclusion/exclusion of home composting;
- the methodology used to report the inputs/outputs of MBT and sorting plants.

In Polish legislation, municipal waste is defined in accordance with EU definitions (Gibbs *et al.*, 2014). The data on municipal waste collected are acquired by a written survey. Since 2005, the municipal waste generated but not covered by the waste collection schemes is estimated based on administrative data – up to 2005 the generated amounts only covered the collected MSW. This caused an underestimation of the total generated amount, as part of the population was not covered by municipal waste collection schemes. In 2012, 80 % of the population was covered by organised collection schemes but since July 2013 all households have been covered by municipal waste collection services. (Polish Ministry of the Environment, 2016; Eurostat, 2015d; Gibbs *et al.*, 2014; Central Statistical Office in Poland, 2013)

Up to 2013, households directly contracted service providers for waste collection services. Due to insufficient policy enforcement by the local authorities, however, many households failed to do so which resulted in illegal waste dumps or utilization of waste in households – for example waste burning. In addition, as many landfills lacked sufficient weighing equipment, waste collection companies in some cases under-reported the collected amounts in order to reduce landfill fees (OECD, 2015; Poland, 2006). All the above-mentioned issues have previously caused an under estimation of the waste generated in Poland. Currently, packaging waste from households collected through producer responsibility schemes is not included in the data reported to Eurostat for municipal waste, according to information from the Central Statistical Office of Poland (Polish Ministry of the Environment, 2015). Therefore, if a larger part of the recycled Polish packaging waste was regarded and reported as MSW, the total recycling of MSW could increase with several percentage points. In other words, the rather low MSW recycling rate in Poland is partly due to a different way of reporting compared with other countries.

In the recent years Poland has increased the amounts of MSW sent to MBT. The outputs of MBT treatment (after biological treatment) are partly used for aftercare of landfills, but mainly they are landfilled (Polish Ministry of the Environment, 2015).

2.3 Important initiatives taken to improve municipal waste management

Municipal waste management was much affected by a rather radical shift towards privatisation when Poland switched to a market-based economy (Tojo, 2008). The collection and management of municipal waste ceased to be the responsibility of the municipalities as such, and the largely private owners of properties – individual houses and apartments – selected a collection company. Waste collectors received money directly from their customers, citizens, in exchange for their service, and no money went to the municipality. This created situations where different companies collected waste from households on the same street, making the collection system inefficient (Tojo, 2008). The companies did not have an incentive to invest in infrastructure, and the cheapest way of managing the waste was to send it to landfill. Many households also reportedly dumped their waste illegally thereby avoiding the cost of waste disposal altogether (ENDS, 2011).

The system also implied that, apart from where a municipality received part of the national landfill tax (fee), they had no, or very limited, resources for waste management (Tojo, 2008). Altogether the situation described above created uncertainties on how to implement better MSW management, it can be seen as an important explanation as to why the Polish MSW management has not achieved a higher level of recycling.

This system fundamentally changed in 2013 when the act on maintaining cleanliness and order in municipalities, as amended in 2011, gave the responsibility for municipal waste management to municipalities (Section 2).

The first experiences of the 2013 reform are positive and indicate that the new system is going to help the country to meet the policy targets for municipal waste. There are, however, still challenges to be met, such as the need for additional capacity and support for municipalities in carrying out their new responsibilities in an efficient manner. Furthermore, in many municipalities the fees set in the first place were insufficient to cover the full costs of waste management and there will likely to be a need to increase the fees in the near future. Other issues of concern include the varying service levels among municipalities with respect to collection frequency and practices, and knowhow in public procurement processes. (OECD, 2015)

The NWMP 2014 sets the following key targets for municipal waste management in Poland (OECD, 2015; Bipro, 2014):

- all non-compliant landfills to be closed – a target that was met by 2012;
- the landfilled share of municipal waste to be reduced to a maximum of 60 % of MSW generated by the end of 2014 (52,63% was achieved) and to a maximum of 50 % by 2016;
- BMW disposed of at landfills to be reduced according to the requirements of the Landfill Directive (1999/31/EC);
- municipal collection to be ensured for all households by 2015;
- separate collection system for at least green waste, paper and cardboard, metal, plastic, glass, waste batteries and accumulators and WEEE to be made available for households in all regions by 2015;
- the recycling rate for packaging waste to be increased to at least 55 % by 2014

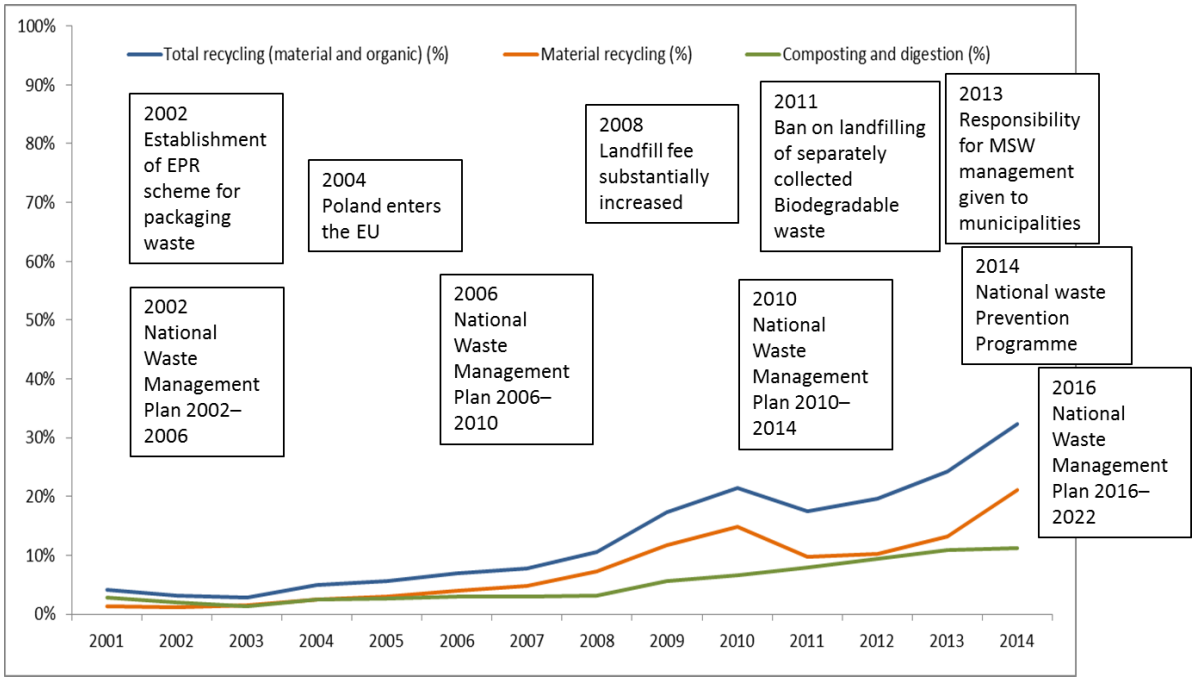
The NWMP 2014 also suggested that an important measure to increase recycling is to increase the charges for the landfilling of mixed waste, biodegradable waste and waste that can be subject to recovery (Poland, 2010a). In 2011 Poland introduced a ban on landfilling of biodegradable wastes that are separately collected (Gibbs *et al*., 2014). Furthermore, the NWMP underlined the importance of providing financial support through environmental funds to cover investments in waste recovery and recycling (Poland, 2010a).

The significant increases in landfill taxes (fees) for MSW in 2008 appear to have already given strong incentives for diverting MSW from landfills. It seems that this increase is the most important initiative that has been taken so far in order to divert MSW from landfills.

A national waste prevention programme was adopted by the Council of Ministers in June 2014 (EEA, 2015).

Extended producer responsibility (EPR) schemes packaging waste was introduced in Poland in 2002 and nation-wide schemes are led by the accredited operator Rekopol Recovery Organisation S.A. and other recovery organisations. The maximum average producer fees range from ca. EUR 60 per tonne for glass to ca EUR 650 per tonne for plastic. The EPR schemes have been an important mechanism contributing to the establishment of infrastructure and increasing separate collection, recovery and recycling (OECD, 2015; EC, 2012).

Figure 2.6 Poland, recycling of municipal waste and important policy initiatives, 2001–2014



Source: Eurostat, 2016 (for data on recycling).

2.4 Possible future trends

Poland does not fulfil the criteria stated in Article 11 (3) of the WFD to get a derogation period for fulfilling the 2020 target of 50 % recycling of MSW. Therefore, for Poland to achieve a recycling rate of 50 % by 2020, the country will need to speed up its efforts.

Chapter 3 in the Polish Waste Management Plan 2014 (NWMP for 2010–2014 with a perspective for 2022) prescribes that the 50 % recycling-target will be achieved by "*a very intensive development of separate collection and sorting of municipal waste*" (Poland, 2010a). It is, however, very important that these initiatives are developed in more detail and then implemented if success is to be achieved. The fourth NWMP, NWMP 2022, was adopted by the Council of Ministers on 1 July 2016 and entered into force on 12 August 2016.

All Polish NWMP's so far have proposed investment in MSW treatment capacity, including recycling and incineration. In the third NWMP, incineration was presented as the preferred means of treating residual waste in urban areas or regions with more than 300 000 inhabitants (OECD, 2015). In the period 2000–2012 a total of EUR 2.4 billion was invested in waste management in Poland. Financing was provided by enterprises including municipal utilities, environmental funds and the EU (OECD, 2015).

Further investment in waste management, however, is needed for the country to meet the EU targets. In the period 2014–2016, the total public investment is estimated at EUR 643 million, of which 78 % is expected to be financed by the EU (Chapter 6, Poland, 2010a). The figures do not include local authorities' investment. In other words, much of the central government's investment is financed by the EU, but additional municipal and private investment is needed. Future investment is going to be targeted especially at food waste treatment in composting and anaerobic digestion plants as well as municipal waste incineration.

By the end of 2015, two new municipal-waste incineration plants were full in operation – in Konin, with a designed capacity of 94 000 tonnes per year with a calorific value of 7.8 megajoules[5] per kilogam; and Białystok, with designed capacity of 120,000 tonnes per year with a calorific value of 7.5 megajoules per kilogam. Two further plants came into full in operation at the end of June 2016, in Bydgoszcz, with a designed capacity of 180 000 tonnes per year with a calorific value 8.5 megajoules per kilogam, and in Cracow with a capacity of 220 000 tonnes per year with a calorific value of 8.8 megajoules per kilogam. A fifth plant, in Poznań, with a capacity of 210 000 tonnes per year with a calorific value of 8.4 megajoules per kilogam, should be operational by the end of 2016, and a sixth, which should come on line in 2017, is under construction in Szczecin.

[5] A megajoule is 1 million joules

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