

## Municipal waste management



**Slovakia** 

October 2016

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# 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 information

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/>

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# Highlights

- Of the municipal solid waste (MSW) generated in Slovakia, 66.5 % was landfilled in 2014.
- Around 15 % of MSW is collected separately. Separate collection systems need to be improved further.
- The total recycling rate of MSW is still very low at 10.3 %.
- Around 11 % of Slovakian MSW is incinerated with energy recovery. There are two incineration plants for MSW in Slovakia.
- Municipalities are responsible for MSW management in their administrative areas.
- There is a landfill tax, called a fee, in Slovakia, and the level of the tax has been increased since its introduction in 2004.

## Introduction

### 1.1 Objective

Based on historical municipal solid waste (MSW) data for Slovakia and EU targets linked to MSW in the EU Waste Framework Directive (WFD), the Landfill Directive and the Packaging and Packaging Waste Directive, the analysis undertaken includes:

- : the historical MSW management performance based on a set of indicators;
- uncertainties that might explain differences in country performance, which may relate more to variations in reporting methodology than differences in management performance;
- indicators relating to the country's most important initiatives taken to improve the management of MSW; and
- possible future trends.

## 2 Slovakia's municipal solid waste management performance

Waste legislation in Slovakia has been brought in line with EU regulations. Since 1993, the strategic direction of waste management has been defined through the concept document *The Waste Management Programme of the Slovak Republic* (WMP SR), adopted by the government. The WMP SR is evaluated regularly, usually every five years, and new targets are set for the next period (EEA, 2010). Since 1993, there have been six WMP SR; the Waste Management Programme of the Slovak Republic 2016–2020 is the latest one.

The Waste Act was adopted in 2001 and was amended in 2006 (Act No. 409/2006 Amending the Act No. 223/2001 on Waste). Due to the proceedings before the Court of Justice of the EU for failure to incorporate the WFD into Slovakian law, the Ministry of Environment of the Slovak Republic has taken the decision to prepare a new amendment of the existing Waste Act. A new Waste Act (No.

79/2015), incorporating all existing waste related regulations and decrees, was adopted in 2015 and entered into force on 1 January 2016.

Recent achievements in municipal waste management in Slovakia include:

- 100 % collection coverage;
- the majority of EU legal requirements are well incorporated in national waste legislation;
- sufficient treatment capacity is available – landfill, incineration;
- producer responsibility schemes are in place for packaging, waste electrical and electronic equipment (WEEE), end-of-life vehicles (ELVs), batteries, paper/cardboard and tyres;
- pay-as-you-throw (PAYT) has been introduced in some parts of the country, with the lowest fee compared to other EU member states with PAYT schemes;
- existing landfills fully comply with the EU Landfill Directive (BiPRO, 2013).

The total amount of municipal waste generated in Slovakia in 2014 was 1 742 000 tonnes, 321 kilograms per person (Eurostat, 2016c). Treatment rates of municipal waste are shown in Table 2.1.

**Table 2.1 Slovakia, treatment rates of municipal waste as percentage of MSW generated, 2014**

Treatment	Rate (%)
Material recycling	5.05
Composting	5.22
Incineration with energy recovery	10.68
Incineration without energy recovery	0.27
Landfilling	66.47
No information	12.31
TOTAL	100

Source: Eurostat 2016c.

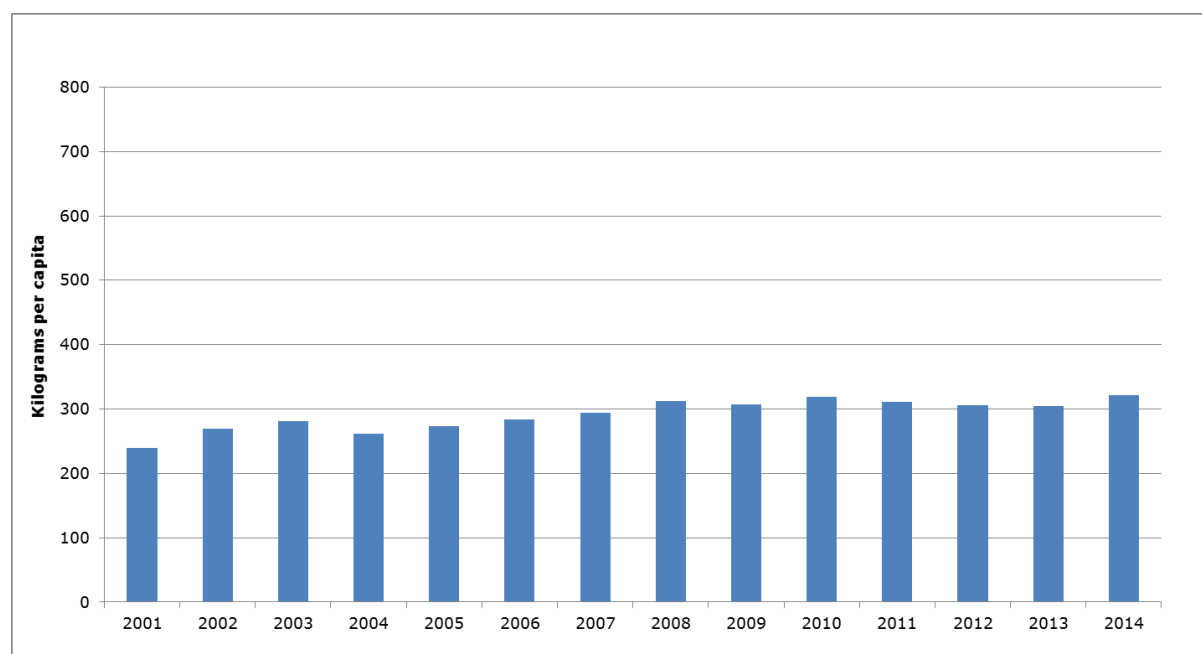
Of the municipal waste generated in Slovakia, 66.5 % is still landfilled. However, according to estimations of the Slovak Environmental Agency (SAZP, 2014) the landfill rate may be lower, due to increasing separate collections of MSW fractions, and if packaging waste from households was taken into account in MSW statistics.



## 2.1 Municipal solid waste indicators

Figure 2.0 shows the development of MSW generation per person in Slovakia from 2001 to 2014.

**Figure 2.0 Slovakia, municipal solid waste generation per person, 2001–2014**



Source: Eurostat, 2016c;

Note: Data for 2001 according to national waste catalogue, from 2002 onwards according to the European List of Waste.

Generation of MSW has increased 13 % from 1.5 million tonnes in 2002 to 1.7 million tonnes in 2014. Landfilling of municipal waste still prevails – around 66.5 % of MSW is landfilled (Eurostat, 2016c). Compared with other EU Member States that entered the EU in 2004–2007, Slovakia has quite a high percentage of incineration with energy recovery of MSW, 10.7 %. There are two incineration plants for MSW, one in Bratislava and one in Kosice.

The amount of separately collected fractions of MSW increased from 3 % in 2002 to 12 % in 2013 (SOSR, 2013).

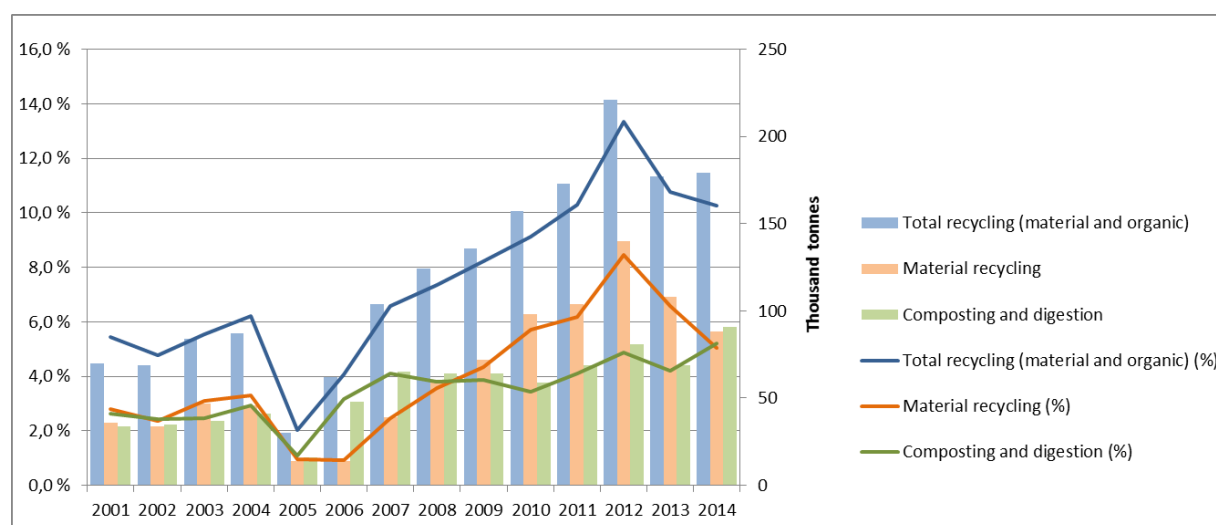
The amounts of MSW generated per person are rather low compared to the EU average of 481 kilograms per person. The official data source for MSW data in Slovakia is the Statistical Survey On Municipal Waste conducted by the Statistical Office of the Slovak Republic. It is an exhaustive annual survey – reporting units are all municipalities in the country. This data source is used for all official publishing and reporting of MSW data – to Eurostat, the Organisation for Economic Co-operation and Development (OECD), etc. All European List of Waste Category 20 wastes – municipal wastes and similar commercial, industrial and institutional wastes including separately collected fractions – are included in those data. However, European List of Waste Category 15 packaging waste, including packaging waste from households, is not included in MSW data (SOSR, 2012).

The problem of old and illegal dump sites still exists and has yet to be adequately addressed (BiPRO, 2013). There were an estimated 300 illegal dump sites in 2007 (BiPRO, 2013).

### 2.1.1 The recycling of municipal solid waste, 2001–2014

Figure 2.1 shows the development of recycling of MSW in Slovakia in terms of total recycling, material recycling, and composting and other biological treatment. As shown, the recycling level is low but since 2001 there has been a positive trend in the recycling of MSW, other than in 2005 when there was a considerable drop<sup>1</sup>. The positive trend has since continued till 2012, with the total percentage of recycled MSW increasing from 5 % in 2001 to 13 % in 2012. In absolute terms, recycling of MSW increased from 36 000 tonnes in 2001 to 213 000 tonnes in 2012. The decrease in the amount of MSW recycled in 2014 is due to the lower amount of waste that has been reported by recycling codes R2–R11.

**Figure 2.1 Slovakia, recycling of municipal solid waste, , 2001–2014, per cent and tonnes**



Source: Eurostat, 2016c.

Note: 2001–2004 values are calculated as percentage of collected waste amounts. Since 2005, the percentages are of generated MSW,

The total increase of recycling is linked both to material and organic recycling, but the share of organic recycling is higher. Organic recycling has increased from 2.6 %, 34 000 tonnes in absolute terms, in 2001 to 5.2 %, 91 000 tonnes, in 2014. In the same period, material recycling has seen a slightly lower increase – from 2.8 % in 2001 to 5.1 % in 2014. It can be assumed that the rate of material recycling would be higher if packaging waste from households was included in Slovakia's MSW statistics.

The recycling rate of MSW in 2013, as published by the Slovakian Statistical Office (SOSR, 2014) after deducting of incinerated MSW, was around 18 %. Of this total, 21 % was material recycling, 42 % composting and 37 % other unspecified recovery operations.

<sup>1</sup> This drop can partly be explained as a statistical issue. From 2005, the data collection system was changed with new research and development codes (according to the WFD), causing a loss of information on final recovery of municipal waste, mainly in recycling and less significantly in composting (Eurostat, 2012). A specific treatment code Z (temporary storage) was introduced in 2005. Reporting units (municipalities) tended to use this specific code when having difficulties in allocating the right recovery and disposal codes to waste. This problem has been eliminated step by step, mainly by consultations with the responding units (SOSR, 2013).

Still, there is room for improving both material and organic recycling, but material recycling in particular could be improved.

The EU's 2008 WFD includes a target for certain fractions of MSW: 'by 2020, the preparing for reuse 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<sup>2</sup>. Slovakia has chosen calculation method 2 (Gibbs *et al.*, 2014). The recycling rates shown in this paper correspond to method 4, the only method for which time series data exist. In 2015, the European Commission 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, including Slovakia (EC, 2015a).

### **2.1.2 Landfilling of biodegradable municipal waste**

According to the EU Landfill Directive, Member States are to reduce the amount of biodegradable municipal waste (BMW) landfilled to 75 %, 50 % and 35 % of the amount generated in 1995 by 2006, 2009 and 2016, respectively. As a country that landfilled more than 80 % of its MSW in 1995, Slovakia has been granted a derogation period of four years and thus has to meet the targets by 2010, 2013 and 2020, respectively.

Slovakia has reported its landfilled amounts of BMW to the European Commission for the years 2006–2011. The baseline for the generated amount of MSW in 1995 has been increased in the most recently reported data from the previously reported 695 000 (EC, 2012) to 944 000 tonnes (EC, 2015b). Slovakia has calculated the amount of biodegradable waste in the year 1995 from the official data of Eurostat under the primary analysis for the Strategy for the Reduction of Biodegradable Waste going to Landfills, drafted in 2010. The amount of 695 000 tonnes of BMW has been calculated as the sum of the waste paper, paperboard, paper products fraction and the food and garden waste fraction. On the basis of communication with the European Commission, these data were revised and a new base value for the calculation of target limits for reduction of biodegradable waste going to landfills was calculated.

Figure 2.3 also shows that Slovakia has not met the 2010 and 2013 BMW diversion targets.

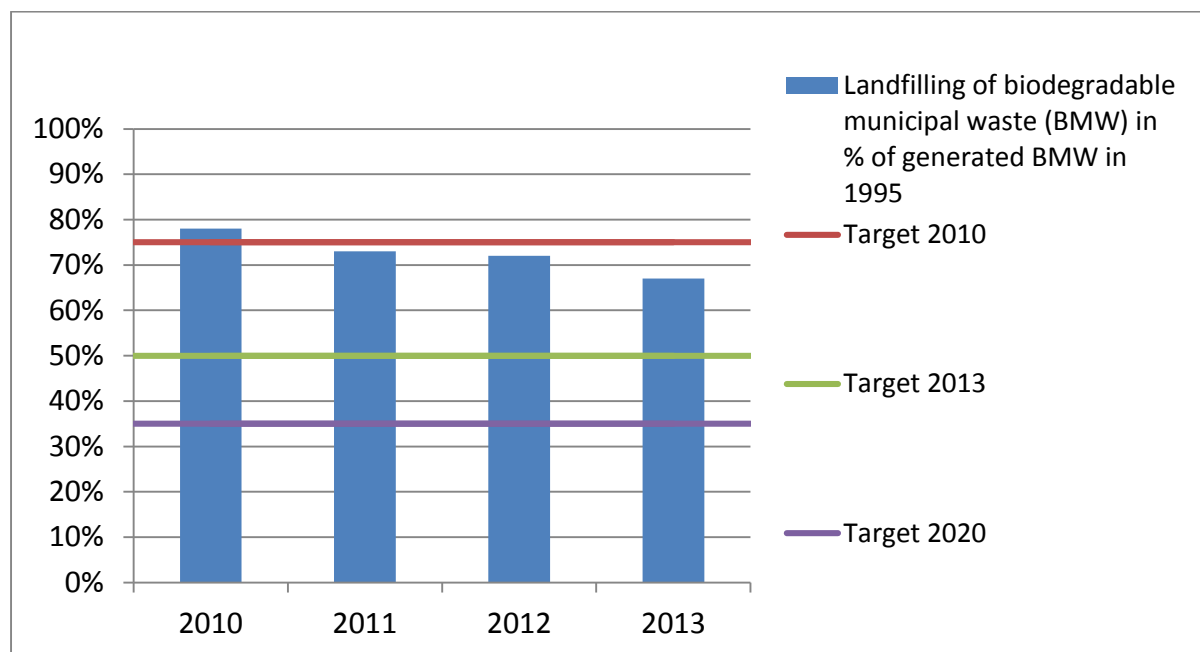
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<sup>2</sup> Commission Decision 2011/753/EU allows countries to choose between four different calculation methods to report compliance with this target. Member States have the option of considering four alternative waste streams and fractions:

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).



**Figure 2.3 Slovakia, landfilling of biodegradable municipal solid waste, 2010–2013, % of biodegradable municipal waste generated in 1995**



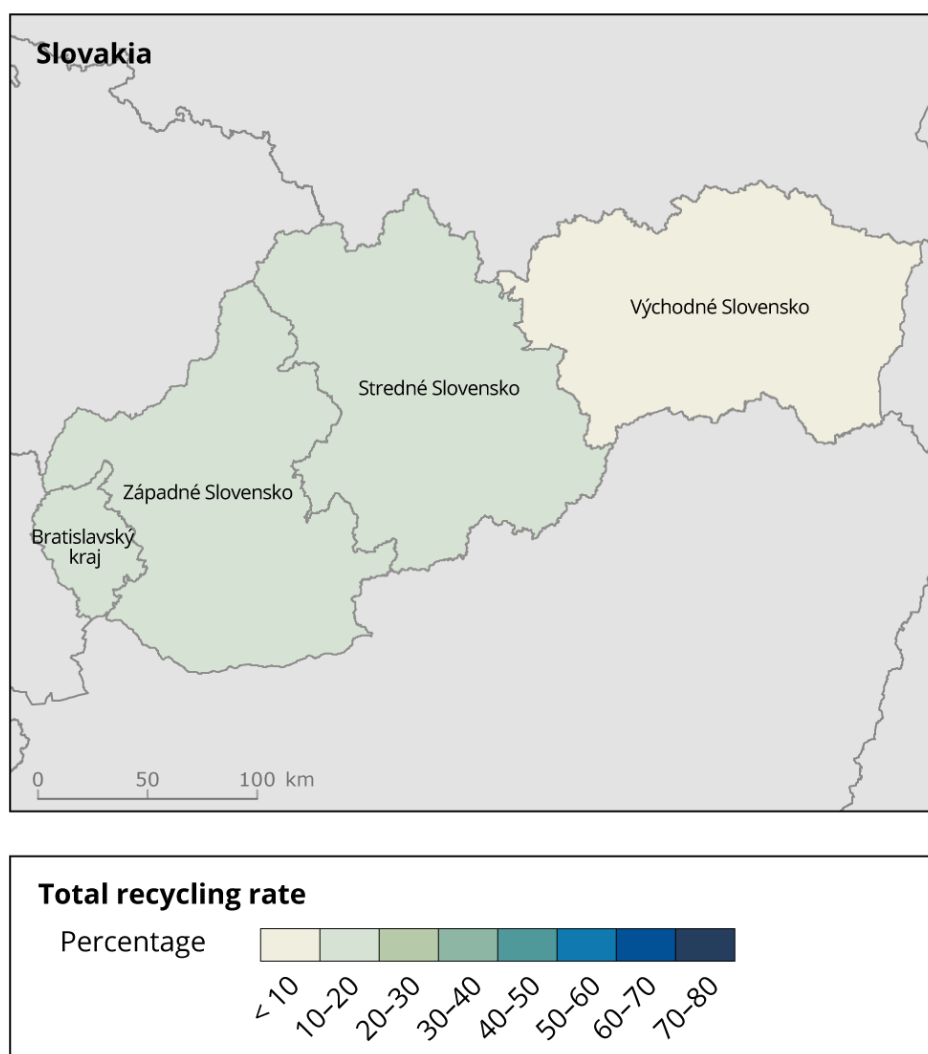
Source: MoE, 2015.

### 2.1.3 Regional differences of municipal solid waste recycling, 2001–2013

Slovakia is divided into four regions (Map 2.1). Regional data has been reported to Eurostat since 2002, and Figure 2.4 shows the regional differences in total MSW recycling – material and organic recycling – for 2002–2013, based on data reported to Eurostat.

The population of most regions is around 1.5–2 million. The highest population is in Západné Slovensko (West Slovakia) with 1.84 million people and Východné Slovensko (Eastern Slovakia) with 1.6 million people out of the total population of 5.4 million. Stredné Slovensko (Central Slovakia) has lower population density, making transportation costs a more significant factor in waste management. Bratislavský kraj, with the capital city and its surroundings, has high population density but a small area (Eurostat, 2015a).

**Map 2.1 Slovakia, regional differences in municipal solid waste recycling, 2013**



Source: EEA, Source: Eurostat, 2016b.

In 2013, the MSW generation in Bratislavský kraj was about 250 000 tonnes representing about 15 % of the municipal waste generated in the country. Production of MSW per person in this region was 403 kilograms, the highest in the country. Západné Slovensko generated the highest regional amounts, 632 460 tonnes representing 39 % of national MSW generation. MSW generation in the Západné Slovensko per capita was 344 kilograms. The remaining two regions generated about 370 000–390 000 tonnes each of MSW, 243–275 kilograms per person (Eurostat, 2016b).

Západné Slovensko and Bratislavský kraj are also by far the most economically developed regions of the country generating gross domestic products (GDP) of about EUR 21–24 billion each, while the two other regions' GDPs are each around EUR 15 billion (Eurostat, 2016d).

All regions show similar trends in recycling. Recycling rates increased from 2005 until 2012, and dropped in 2013. Stredné Slovensko shows the highest recycling rate compared to the national level but the differences between regions are rather small. These similar regional recycling rates point to a balanced system setup of national waste management, and limited differences between recycling policies in the different regions.

**Figure 2.4 Slovakia, regional differences in recycling of municipal solid waste, 2001–2013**



Source: Eurostat, 2016b.

## 2.1.4 The relationship between landfill tax levels and recycling levels of municipal solid waste

A landfill tax, called a fee in Slovakia, was established by Act No. 17/2004 Coll. on Charges for Landfilling of Waste, and has been applied since 1 February 2014. The tax/fee varies according to waste type and for MSW according to the number of waste fractions separately collected from households. When the MSW is sorted at the source into less than four fractions, the tax/fee is EUR 9.96 per tonne, but when it is sorted at the source into five fractions, the tax/fee is EUR 4.98 per tonne (Slovakia, 2014). Compared to landfill taxes in other European countries, the tax/fee is rather low. The municipality within which the landfill is sited gets a part of the tax/fee revenue to support investment in waste management.

The separate collection system of municipalities is mainly based on bring systems, including for packaging, and civic amenity sites. Separately collected waste – paper, plastics, metals, glass, etc. – is treated in sorting facilities.

## 2.1.5 Environmental benefits of better municipal solid waste management

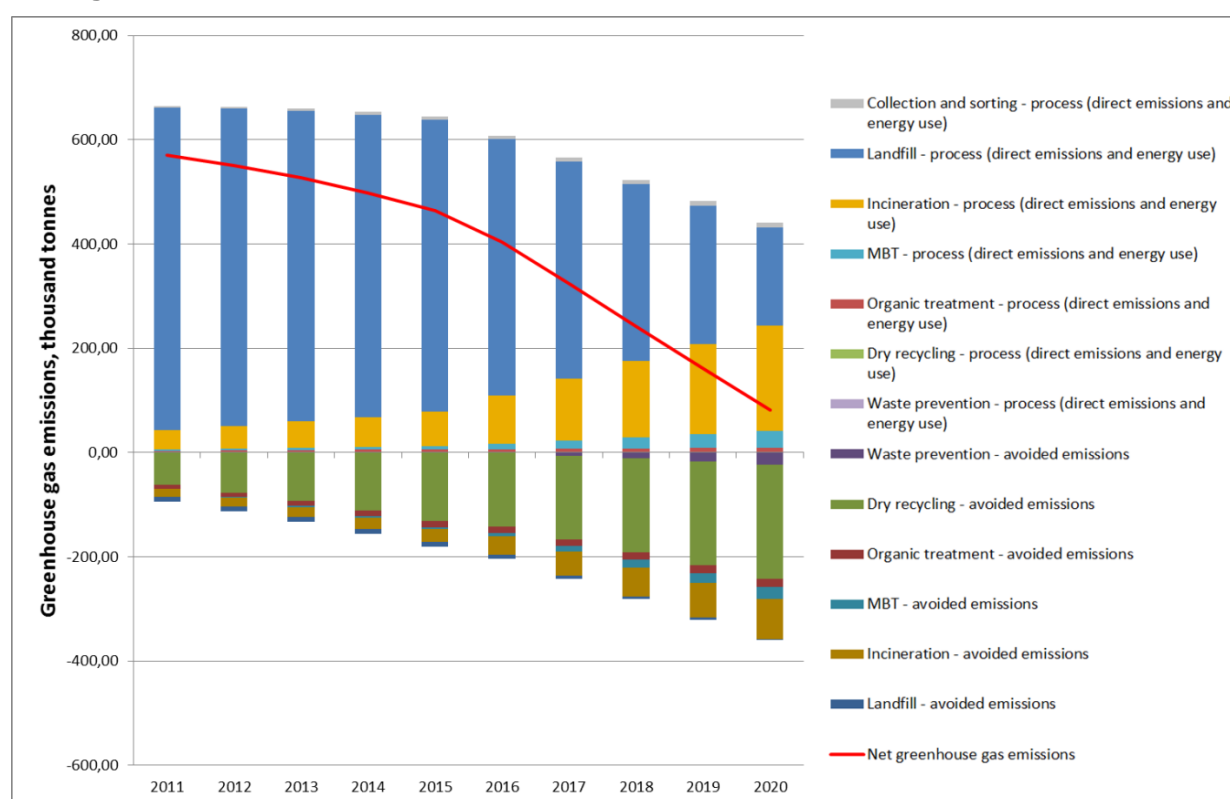
Figure 2.5 shows a scenario for the development of greenhouse gas emissions from MSW management in Slovakia. The scenario assumes waste arisings of 500 kilograms per inhabitant in 2035, multiplied by projected population in 2035, and linearly interpolated back to latest year data (2011). The scenario also assumes that the EU targets for municipal waste are fully implemented. 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 and the generation of energy by waste management processes. The more detailed methodology is described in Gibbs *et al.* (2014). The level of emissions depends on the amount of waste generated and the treatment it undergoes each year.

Figure 2.5 shows the direct emissions, the avoided emissions and the net emissions from 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; mechanical biological treatment (MBT) and related technologies; collection and sorting; incineration and landfilling.

For the 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 MSW. The modelled scenario assumes full implementation of the existing EU targets on municipal waste management (Gibbs *et al.*, 2014).

**Figure 2.5 Slovakia, greenhouse gas emissions from municipal solid 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 for 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.

In countries with a low share of landfilling and high rate of recycling, waste treatment can have an overall positive impact on greenhouse gas emissions – reducing greenhouse gas emissions from the economy as a whole. Slovakia is not yet one of these countries. However, based on the modelled scenario with full policy implementation, the net emissions from the treatment of municipal waste in

Slovakia are expected to decrease in the period 2015–2020. The reduction will mainly be due to increased recycling of MSW, which results in more and more avoided greenhouse gas emissions.

## **2.2 Uncertainties in the reporting**

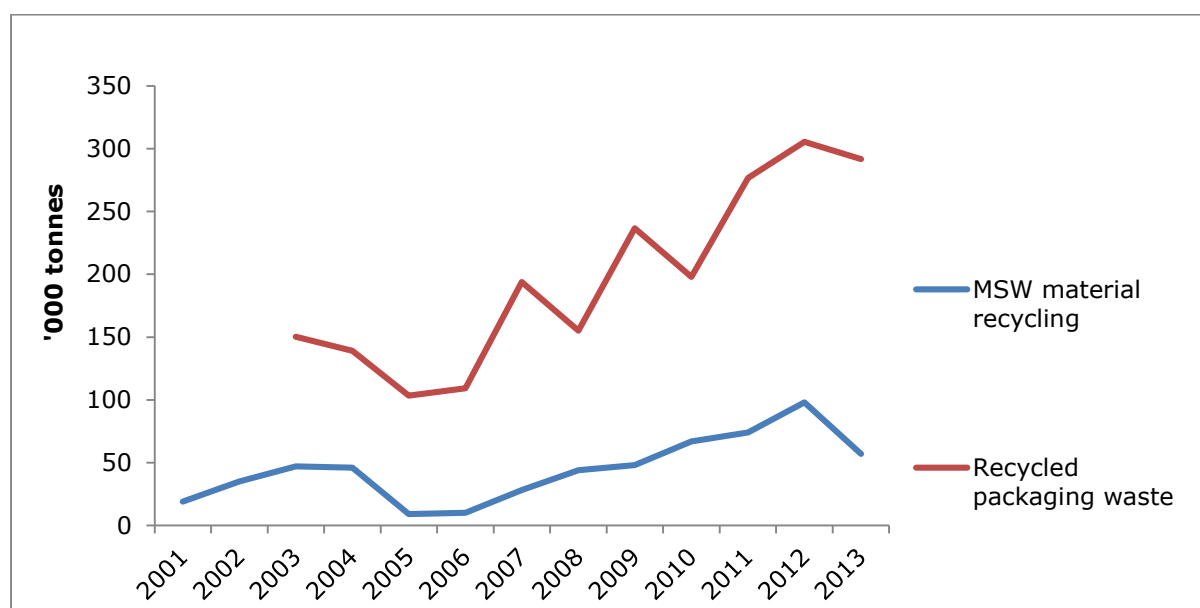
Some uncertainties or differences in how countries report the recycling of MSW can result in different recycling levels. This applies, for example, to the following issues:

- 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, such as the inclusion/exclusion of home composting;
- the methodology used to report the inputs/outputs of MBT and sorting plants.

Most Member States, including Slovakia, have producer responsibility schemes on packaging waste. Private operators of these schemes do not always report on the sources of the collected packaging waste, and therefore packaging waste is not always reported to Eurostat as MSW.

Figure 2.6 shows that the amount of recycled MSW in Slovakia was significantly lower than the amount of recycled packaging waste, and the development trends between packaging waste recycling and MSW recycling differ considerably. This indicates that Slovakia has not included the recycled packaging waste from households and similar packaging from other sources in its reporting of recycled MSW to Eurostat. This has been confirmed by the Slovakian authorities. According to the official reporting of MSW data recycled packaging waste belonging to European List of Waste Category 15 is not reported as recycled MSW (SAZP, 2012).

**Figure 2.6 Slovakia, comparison of the amounts of packaging waste and material municipal solid waste recycled, 2001–2013**



Source: Eurostat, 2016c, Eurostat, 2015b.

### **2.3 Important initiatives taken to improve material solid waste management**

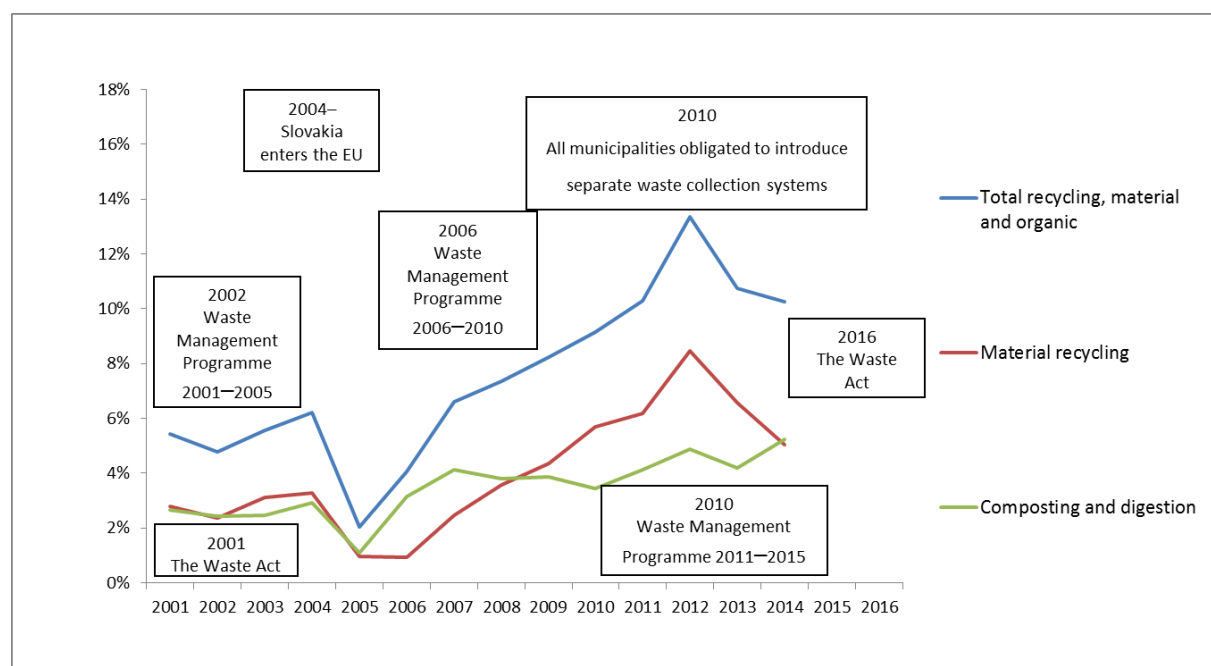
The state of the general environmental awareness of the public is rather low and needs substantial improvement. Thus, raising awareness and involving citizens could be an important tool for promoting better waste management (BiPRO, 2013). In order to increase levels of awareness, numerous information campaigns addressing specific target groups, such as households, the public, businesses, schools, tourists, and industry, have been organised in Slovakia.

To improve waste management, activities for the improvement of separate collection systems and the recovery of selected waste types are supported through state subsidies, by means of the state Environmental Fund, as well as by the non-state Recycling Fund.

The existing recycling infrastructure is sufficient and could even handle an increased rate of separately collected waste (BiPRO, 2013).



**Figure 2.7 Slovakia, recycling of municipal solid waste and important policy initiatives, 2001–2016**



Source: Eurostat, 2016c; MoE, 2015, 2010a; Slovakia, 2015.

Competent authorities in Slovakia have planned some measures in the field of municipal waste management. Among these are (BiPRO, 2013):

- improvement of conditions for separate collection by using information campaigns and infrastructural investment, including adopted collection schemes;
- elimination of illegal dump sites;
- improvement of technical conditions for waste processing and recycling;
- minimisation of landfilling of municipal waste by improving alternative waste management infrastructure and use of financial tools;
- full implementation of the polluter-pays principle in the whole country and increasing the tax/fees for landfilling waste;
- public information and awareness campaigns to stop littering and improve environmental protection related to waste issues;
- further improvement of the quality (reliability) of waste management data.

In 2010, the Slovak Republic had introduced the Strategy for the Implementation of the Reduction of Biodegradable Waste Going to Landfills (MoE, 2010b), and subsequently, a number of measures have been adopted:

- involving people from municipalities in community and home composting;
- increasing the separate collection of paper and paperboard;
- supporting the building of plants producing biogas from waste;

- legislative support for the use of waste as alternative fuel, new technical standards for the production and composition of this alternative fuel, support for the construction of facilities and suitable technologies;
- amending legislation regarding the prohibition of kitchen waste crushers.

On 1 January 2016 a new Act on Waste (no. 79/2015), containing the following main measures on municipal waste, came into force.

- Re-allocation of responsibilities for municipal waste management between municipalities and producers of specified products, implemented since 1 July 2016, is the crucial change in municipal waste management in the Slovak Republic. Specified product means a product to which extended producer responsibility is applied. According to the Act No 79/2015 Coll. on Waste and amendments to certain acts (Waste Act), producer responsibility schemes have been introduced for specified products – electrical and electronic equipment, batteries and accumulators, packaging, vehicles, pneumatic tyres and non-packaging products (Part No 4, § 27 - § 75).
- According to § 27 (4) (k) of the Waste Act, producers of specified products should ensure that the whole quantity of a separately collected component of municipal waste falling within a specified waste stream is collected in the municipality for which they are responsible for this specified waste stream. This obligation is in force, despite the fact, that the producers met the binding recovery and recycling limits of specified waste streams.
- The producers of specified products are also obligated to carry out promotional and educational activities focusing on end-users and concerning the management of a specified waste stream, separate collection of MW and waste prevention.
- According to the previous Slovak waste legislation, municipalities were responsible for management of all generated municipal waste. Implementation of the extended producer responsibility should not only contribute to recycling, but also to waste prevention and re-use and recovery of waste from the above-mentioned products. As a result, the amount of municipal waste going to landfill should fall.

The new Waste Management Plan of the Slovak Republic 2016–2020 was approved by the government on 14 October 2015, (MoE, 2015) and includes:

- implementation of extended producer responsibility into the municipal waste separate collection system for the components of it that are covered by the principle of extended producer responsibility;
- implementation of the principle that the extent of landfill fees depends on the share of separated municipal waste;
- adoption of a unified methodology for the determination of municipal waste composition;
- the possibility of the implementation of a new collection system for disposable beverage packaging – this depends on an evaluation of the separate collection of municipal waste;
- support of funding projects aimed at household and community composting, the modernisation of existing composting facilities, and biogas plants processing biodegradable kitchen and restaurant waste;
- adoption of the national programme on household composting;
- implementation of the Action Plan on Support of Placement of Compost from Biodegradable Waste on the Market.
- examination of the possibility of introducing a prohibition on landfilling BMW;

- support for using alternative fuels derived from mixed municipal waste when environmentally appropriate material recovery is not suitable.

## **2.4 Possible future trends**

As indicated in Figure 2.3, the trend of diversion of BMW from landfill is in the right direction but efforts need to be intensified in order to fulfil the Landfill Directive's diversion targets of landfilled BMW by 2020.

Figure 2.6 indicates that MSW recycling rates would be higher if recycled packaging waste from MSW sources were systematically included in the reporting of recycled MSW. It is, therefore, important to improve the data in order to get a reliable picture of the MSW management situation and measure progress towards better waste management.

The new Waste Act establishes separate collections for waste paper, plastics, metals, glass, bio-waste, and food waste (Slovakia, 2015).

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