Country fact sheet

Municipal waste management

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Romania

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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 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

- The total recycling rate in Romania is still relatively low, 13 %.
- Romania only includes recycled packaging waste from households to a limited extent in the reporting recycling of municipal solid waste (MSW).
- The main challenge is to develop the infrastructure for separate collection and recycling of municipal waste.
- Romania will need to speed up its efforts in recycling in order to meet the Waste Framework Directive's (WFD) target to recycle 50 % of MSW.
- The 2010 target for the diversion of biodegradable municipal waste (BMW) sent to landfill seems to have been met but the quality of the data is uncertain;
- So far, few policy steps have been taken towards improving recycling and new initiatives are required.

1 Introduction

1.1 Objective

Based on historical municipal solid waste (MSW) data for Romania, 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 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 to management performance;
- indicators relating to the country's most important initiatives for improving MSW management; and
- possible future trends.

2 Romania's municipal solid waste management performance

The first National Waste Management Strategy in Romania was developed in 2003, and published in early 2004, following the incorporation of European legislation on waste management and according to the provisions of the Emergency Government Ordinance no.78/2000 on the waste regime, approved in 2001. The strategy was intended to cover the period 2003–2013, and was set to be subject to periodical revisions (Romania, 2004). The strategy is based on the principle of protection of primary resources, the prevention principle, the polluter pays principle correlated with the principles of producer and user responsibility, the substitution principle, and the principle of proximity correlated with the principle of autonomy. The National Waste Management Strategy was revised in late 2013 (Arcadis, 2014).

The National Waste Management Plan (NWMP) for 2004–2009 was also developed in 2004 in order to take the necessary action to reach the objectives of the Strategy (Romania, 2004). In order to increase the efficient implementation of the National Waste Management Plan, Regional Waste Management Plans for the eight Romanian regions were issued in 2006 (Larive Romania IBD SRL, 2011). The NWMP is currently outdated and a revision has been planned. The schedule for the adoption of the new plan, however, is unclear (Arcadis, 2014; Gibbs *et al.*, 2014a).

The EU legislation on municipal waste management has been fully incorporated into Romanian legislation by the Law on Waste (211/2011); Governmental Decision 349/2005 on landfilling waste and Ministry Order 757/2004 approving the technical norms on landfilling waste; Governmental Decision 621/2005 on packaging and packaging waste management, as amended; Governmental Decision 128/2002 on waste incineration and Ministry Order 756/2004 approving the technical norms for waste incineration. (BiPRO, 2012)

Municipal waste management in Romania is the responsibility of three levels of authorities: the Ministry of the Environment and the Ministry of Administration and Interior, county councils and municipalities. Regional Environmental Protection Agencies (regional EPAs) prepare regional waste management plans (WMPs) whereas county councils prepare county-level ones. County councils are responsible for managing final disposal facilities and transfer stations. The informal sector, usually driven by the poor population in the cities, still plays a significant role in the collection, separation and trade of valuable recyclables from municipal waste. (BiPRO, 2012)

Formal municipal waste collection services reportedly covered 70 % of the total population in 2010 – 85 % of the urban population and 52 % of the rural population. Mixed municipal (residual) waste is collected by a door-to-door system; in some locations bring-site systems operate in conjunction with the door-to-door system. Since 2004–2006, some collection of recyclables – paper, cardboard, glass, metal packaging and mixed plastics – has taken place at bring sites; however, separate collection of recyclables is rare and its coverage cannot be estimated. Civic amenity sites providing for the collection of waste electrical and electronic equipment (WEEE) and batteries are run by local authorities or by private companies. Plans have been made to expand the services of civic amenity sites to cover bulky waste and possibly other waste materials (Gibbs *et al.*, 2014a).

The responsibility for the collection and management of MSW lies with the municipalities. The local councils can operate the collection services themselves or they can contract authorised private operators. Funding of collection services varies between municipalities. The residents either pay fees directly to the municipality or to the collection company, or alternatively through the rent in blocks of flats. House owners contract collection companies individually. Commercial businesses also pay directly for waste collection services. Packaging collection at bring sites is funded by producer responsibility organisations. Romania has not so far implemented any pay-as-you-throw (PAYT) schemes (Gibbs *et al.*, 2014a; Bipro, 2012)

Sorting facilities in Romania mostly rely on manual processing with very limited use of more advanced mechanical sorting. The outputs of sorting stations – paper, cardboard, plastic, metal, wood and biodegradable waste – are delivered to recycling facilities. There are 22 composting plants in operation (BiPRO, 2012) but no mechanical biological treatment (MBT), incineration or anaerobic digestion facilities for municipal waste treatment. (Gibbs *et al.*, 2014a)

Most municipal waste in Romania is currently disposed of in landfills. In 2012 there were 30 operational landfills that complied with the EU regulations. The country is in the process of closing non-compliant landfills by 2017. (BiPRO, 2012)

The generation of MSW in Romania increased from 7.5 million tonnes in 2001 to 8.4 million tonnes in 2008, and has since then decreased to 5.4 million tonnes in 2013. Variations in waste generation can at least partly be explained by poor data quality and differences in the calculation methodologies used over the years, an issue discussed further in this paper. According to the reporting to Eurostat, between only 75 % and 82 % of the generated waste has been reported as treated[1] in 2001–2013 (Eurostat, 2016). In 2013, 81 % of the municipal waste generated was reportedly treated.

2.1 Municipal solid waste indicators

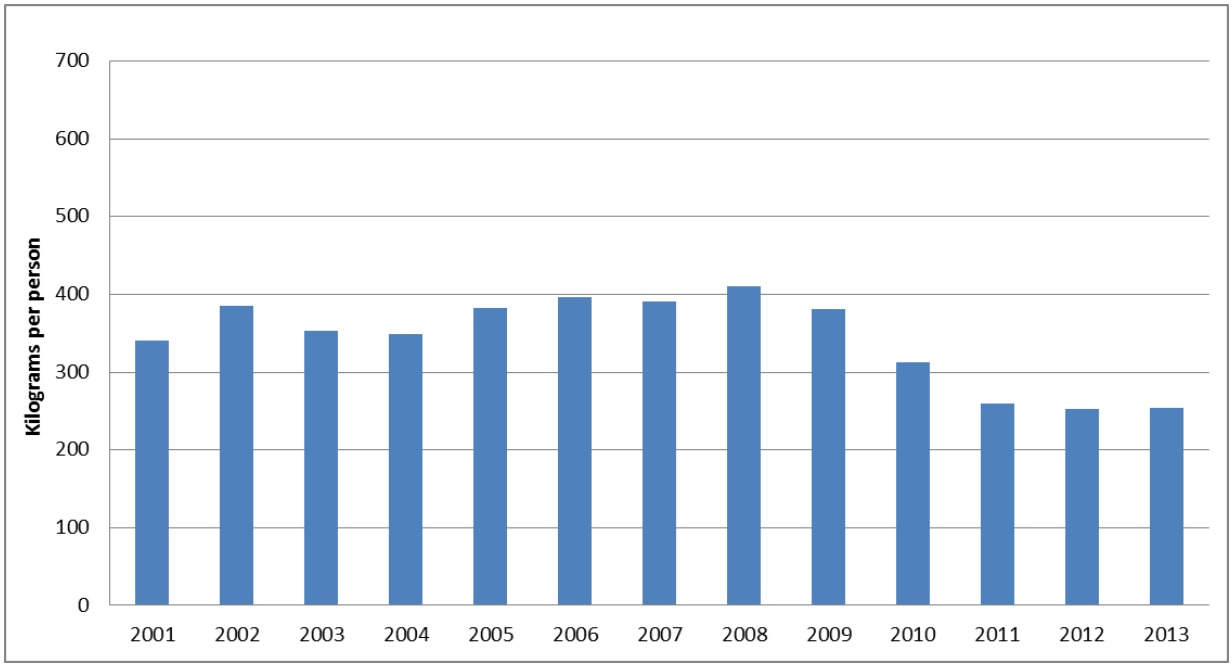
The following indicators illustrate the development of the Romanian MSW management in 2001–2013. All percentage figures have been calculated by relating the waste managed to the generated amount – rather than the treated amount. Relating it to the total managed amount of MSW would result in higher rates for all waste management paths in Romania.

Figure 2.0 shows the development of MSW generation per person in Romania from 2001 to 2013. There was an increase from 341 kilograms per person in 2001 to 411 kilograms in 2008, and has since fallen to 272 kilograms per person. This decrease might be linked to the economic crisis, which started in 2008.

[1] Treatment rates are dependent on several factors:

- waste undergoing MBT treatment loses mass, and as only final treatment amounts are to be reported to Eurostat, the waste treatment rates might be lower than the generation and collection rates;
- some countries estimate waste generation based on population – common where the collection coverage is less than 100 %; in Romania treatment rates are based on actual waste amount statistics.

Figure 2.0 Romania, municipal solid waste generation per person, 2001–2013



Source: Eurostat, 2016.

The primary treatment method for municipal waste in Romania is landfilling with more than 78 % of the generated municipal waste – more than 96 % of the treated amount – being landfilled (Eurostat, 2016).

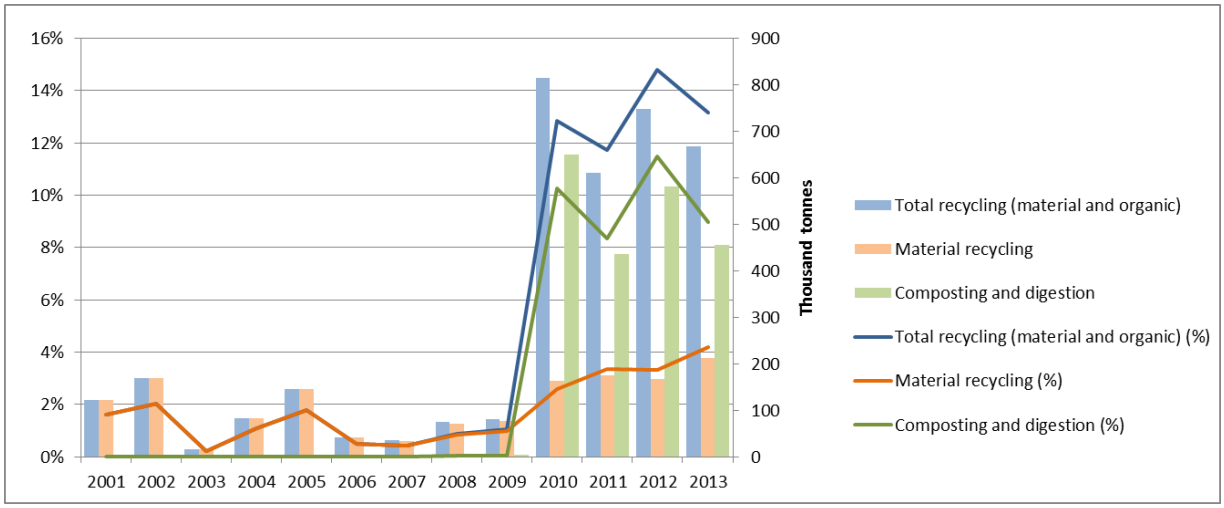
The waste generated by the population not connected to formal waste collection services, and which thus remains uncollected, is not included in the municipal waste reported annually to Eurostat. However, estimates of the uncollected waste are included in the waste statistics regulation data produced every two years. (Gibbs, *et al.*, 2014)

2.1.1 Municipal solid waste recycling, 2001–2013

Figure 2.1 shows the evolution of MSW recycling in Romania – total recycling, material recycling and composting and other biological treatment.

In 2001 and 2002 data originates from an administrative source, but from 2003, the methodology of data collection and processing changed. For 2003–2006, the figures include all recovery operations; for 2007, they only include only recovery operations R2-R11 (excluding composting), according to the classification of the WFD. (Eurostat, 2015d)

Figure 2.1 Romania, recycling of municipal solid waste, 2001–2013, per cent and tonnes



Source: Eurostat, 2016.

The total level of recycling of MSW in Romania, 13 %, is low but shows significant progress in the last few years, especially related to organic recycling. Still, however, there is room for improving both material and organic recycling of MSW.

The composition of the total quantity of separately collected waste in 2010 is shown in Table 2.1.

Table 2.1 Romania, composition of separately collected municipal waste, 2010

Total separately collected ('000 tonnes)	Biodegradable	Plastic	Paper/cardboard	Glass	Metal	Wood	Bulky waste	Other waste
169.8	33.9	26.8	32.2	11.7	1.2	2.3	23.3	38.4

Source: Gibbs *et al.*, 2014a

Biodegradable waste and paper/cardboard represent the highest shares of separately collected municipal waste which is in large part due to the fact that there are many awareness raising campaigns in schools and education institutions where paper is collected. Furthermore, there is a tradition for collecting paper waste separately.

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[2]. Romania is likely to use calculation method 2 (Gibbs *et al.*, 2014a). The recycling rates shown in this paper

[2] 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).

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 Romania (EC, 2015).

2.1.2 Landfill of biodegradable municipal waste

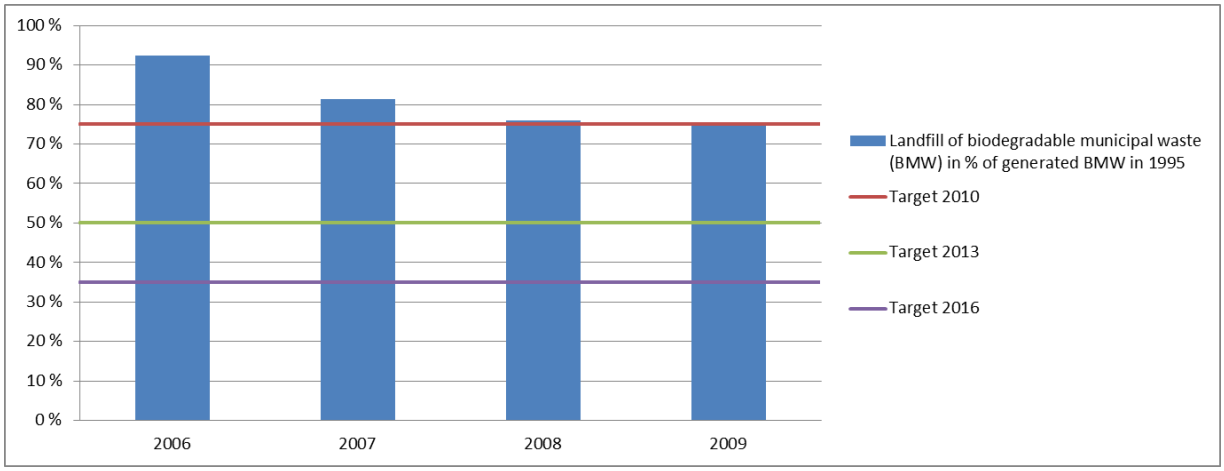
According to the EU Landfill Directive, all Member States must reduce the amount of biodegradable municipal waste (BMW) landfilled by a certain percentage by 2006, 2009 and 2016 in comparison to the BMW generated in 1995. Countries that were landfilling more than 80 % of their MSW in 1995 had the option to obtain a derogation period of a maximum of four years. Romania qualified for this derogation and has to meet the targets by 2010, 2013 and 2020. However, Romania has decided not to use the derogation option for the 2016 target (BiPRO, 2012). In the reference year 1995 Romania generated 4.8 million tonnes of BMW.

Romania has reported its landfilled amount of BMW to the Commission for the years 2006–2009. According to this data, the percentage BMW landfilled dropped from 92 % in 2006 to 75 % in 2009 (EC, 2014), indicating an early fulfilment of the 2010 target.

Although the figures indicate a decrease of BMW landfilled, it is important to note that there has been no actual decrease in the total quantity of MSW landfilled in this period, and no increase in recycling and incineration levels have been reported.

One possible explanation could be that the generation of BMW has decreased considerably, but this explanation seems unlikely. Treatment of BMW in MBT plants might be another explanation, but the National Environmental Protection Agency of Romania has indicated that there are currently no functioning MBT plants. The explanation might be linked to the poor quality of data. According to information gathered by Gibbs *et al.*, (2014) there seems to be some confusion in the waste materials included in the BMW. Certain biodegradable materials, paper, wood, etc., might not be included in the BMW data Romania reports to the European Commission and the actual figures of BMW generation might be higher than reported.

Figure 2.2 Romania, landfill of biodegradable municipal waste, 2006–2009, % of biodegradable municipal waste generated in 1995



Source: EC, 2014.
Note: the first two target dates take account of Romania's 4-year derogation period.

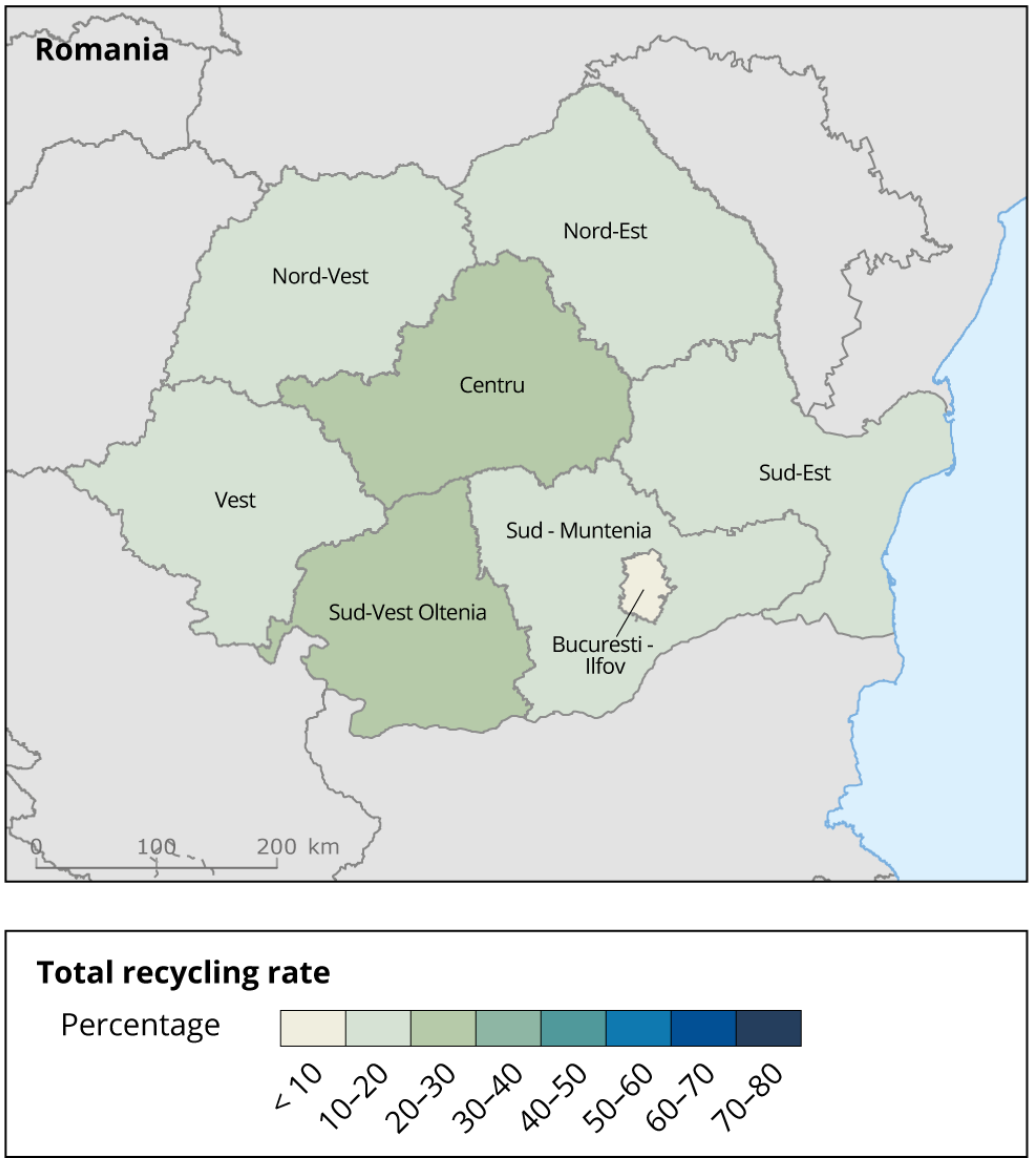
2.1.3 Regional differences in municipal solid waste recycling

Regional data for Romania have been reported to Eurostat from 2008 onwards, but data are missing for 2009 and 2013.

Romania is divided in eight regions. The most populous is Nord-Est with 3.3 million inhabitants out of the country's total of 19.9 million. In the other regions, populations range from 1.8 million in Vest to 3.1 million in Sud-Muntenia (Eurostat, 2015c).

Map 2.1 shows regional differences in the MSW recycling for 2012, the latest year with available regional data.

Map 2.1 Romania, regional differences in municipal solid waste recycling, 2012



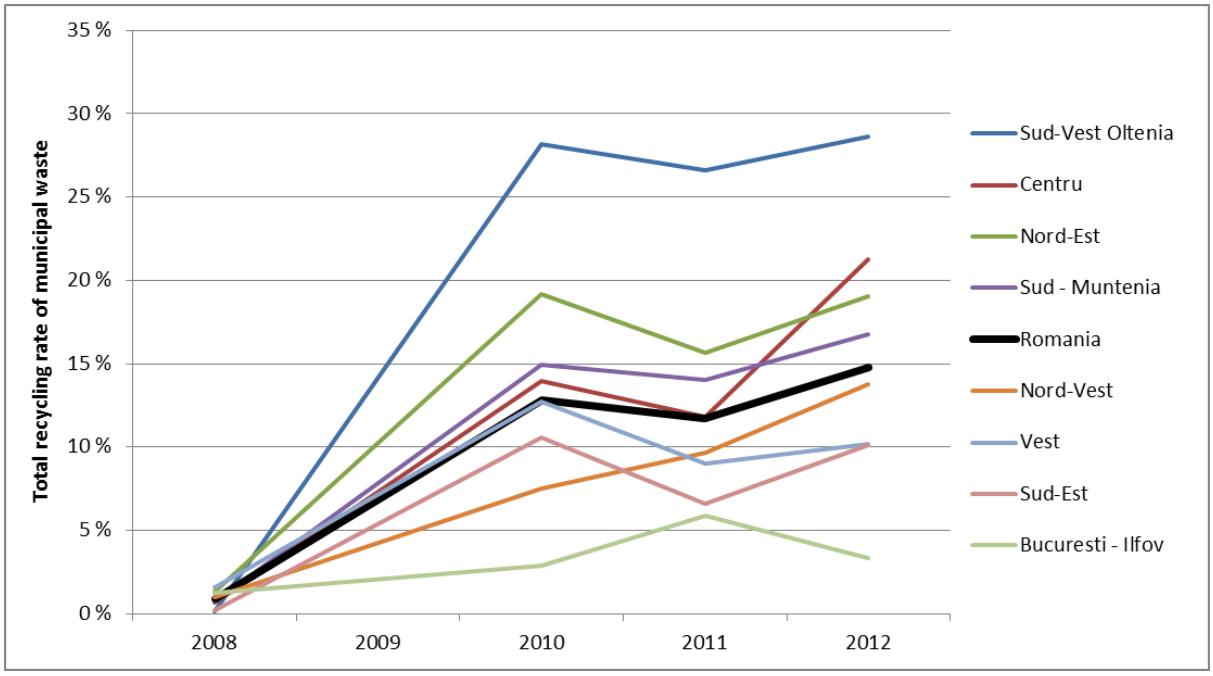
Source: Eurostat, 2015a.

The MSW generation of the most populous region Nord-Est was around 820 000 tonnes in 2013, representing 16 % of the municipal waste generated in the country. The other regions' shares ranged from 9 % to 15 % (Eurostat, 2015a).

Bucuresti-Ilfov is by far the most economically developed region of the country: its gross domestic product (GDP) per person in 2013 was 65 % that of the EU average while the other regions' figures reached only between 17 % in Nord-Est and 30 % in Vest according to Eurostat data for 2013. (Eurostat, 2015b)

Figure 2.3 shows regional differences in MSW recycling for the period 2008-2012 related to total recycling, the sum of material and organic recycling, based on data reported to Eurostat.

Figure 2.3 Romania, regional differences in recycling of municipal solid waste, 2008–2012



Source: Eurostat, 2015a.
Note: Data unavailable for 2009.

As previously discussed, even though there is an increasing national trend (Figure 2.1) the recycling rates in Romania are still low. Figure 2.3 shows substantial differences in recycling rates between the regions over the years. The trends for each region seem to be rather continuous with no major deviations. For most regions the trend in recycling is increasing in accordance with the national development. However, the regional data on recycling depicted in Figure 2.4 for 2010–2012 is on significantly higher level than the national data as shown in Figure 2.1, for the most part due to organic recycling. If the regional recycling data are added up to a national figure, Romania recycled 15 % of its municipal waste in 2012, compared to 2.6 % according to reported national data. The reason for the differences is likely to be methodological differences between the reporting of national data and regional data.

2.1.4 Recycling and landfill taxes

Romania currently does not have a landfill tax but the introduction of one is being discussed (BiPRO, 2012).

2.1.5 Environmental benefits of better municipal solid waste management

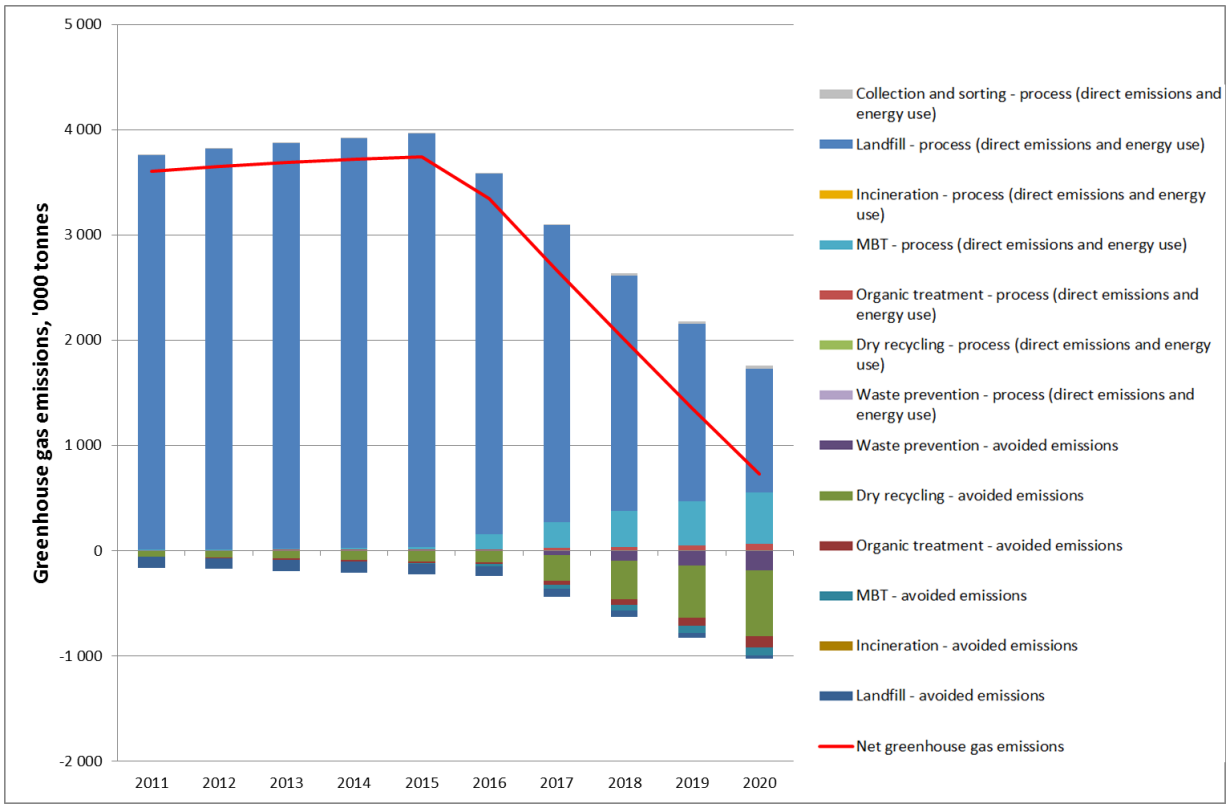
Figure 2.4 shows a scenario for the development of greenhouse gas emissions from MSW management in Romania. The scenario assumes a yearly increase of 2.6 % in municipal waste generation for 2011–2015 and a yearly increase rate of 1.25 % for 2015–2020. The scenario also

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, or the generation of energy by waste management processes. The more detailed methodology is described in Gibbs *et al.* (2014b). The level of greenhouse gas emissions depends on the amount of waste generated and the treatment it undergoes each year.

Figure 2.4 shows the direct emissions, the avoided emissions and the net emissions of 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 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 the MSW. (Gibbs *et al.*, 2014c)

Figure 2.4 Romania, scenario for 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.

Based on the modelled scenario with full policy implementation, the net greenhouse gas emissions from the treatment of municipal waste in Romania are expected to increase in the period 2011–2015 and then begin to decrease. In 2020, the direct emissions from collection and treatment operations are still expected to be higher than the benefits of better waste management. In the first modelled years of the scenario the direct greenhouse gas emissions related to municipal waste management are linked solely to landfilling.

Greenhouse gas emissions from landfills are caused by the breakdown of organic wastes accumulated in landfills over the past decades. However, in the model the landfill impacts are calculated over a 100-year period, with the total impact over this period being attributed to the year in which the waste is deposited (Gibbs *et al.*, 2014b). Therefore, the positive effect of diverting BMW from landfills can be immediately observed in the results as reduced greenhouse gas emissions from landfilling. According to the model, towards 2020 a growing share of the greenhouse gas emissions of waste management in Romania will originate from MBT process.

2.2 Uncertainties in the reporting

Some uncertainties or differences in how countries report 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.

Romania's municipal waste data are collected by questionnaires filled in by waste producers, sanitation operators, operators of treatment installations, waste collection and recycling companies and sewage plants. Data for municipal waste is extracted from the reports submitted by sanitation companies. As discussed previously, waste generated by the population not connected to formal waste collection services, and which thus remains uncollected, is not included in the municipal waste reported annually to Eurostat. (Gibbs *et al.*, 2014a)

The data reported to Eurostat currently only includes packaging waste recycling reported by collectors engaged by local authorities. Data from other recycling operators permitted to collect waste, such as producer responsibility organisations and collection points authorised to purchase materials from the informal sector, are currently not included in the reported amounts of generated MSW. Construction and demolition waste generated by households and collected by sanitation companies are excluded from Eurostat data, but included in national data. (Gibbs *et al.*, 2014a)

Information obtained by Gibbs *et al.* (2014a) from the Romanian authorities indicates that the rejects from sorting plants are not included in the reported recycling data and thus the reporting is based on outputs.

2.3 Important initiatives for improving municipal waste management

In Romania, regulation for the management of MSW is in its early stages. Romania's accession to the European Union in 2007 has put waste management under the regulative influence of various European Directives.

In Romania, the organisation of collection, transport and treatment of municipal waste is the responsibility of local public administrations, who then decide to either manage it themselves or

outsource it to private operators. There are approximately 400 authorised operators for waste management services, with the largest 10 having more than an 80 % market share. The market is currently undergoing a consolidation process through mergers, market exits and take-overs (Larive Romania IBD SRL, 2011). The market for selective waste collection services is also quite fragmented, with more than 1 000 companies having been licensed nationally for the collection of packaging waste. The paper/cardboard and metal waste management have by far the most efficient recovery and recycling systems (Larive Romania IBD SRL, 2011).

Extended producer responsibility (EPR) is in place for packaging waste. The producers placing packaged products or packaging on the Romanian market are obliged to achieve recovery and recycling targets or join one of the seven authorised recovery organisations for packaging waste that take over the responsibility to organise the recovery and recycling activities as well as reporting objectives. Voluntary deposit systems have been adopted for some types of packaging such as reusable bottles in the beer industry. Disposal of packaging waste materials at landfills has been prohibited. (BiPRO, 2012)

Waste collection for recycling was introduced in 2004–2006, led by town halls and private sanitation companies, working in collaboration with packaging manufacturers. This approach led to varying quality and uneven availability of services among municipalities. Over the years, however, the coverage of separate collection services has grown and is expected to grow further in the future due to adoption of relevant regulations (Gibbs *et al.*, 2014a). In the period 2007–2017, municipalities are required to develop a solid infrastructure for separate waste collection, which is expected to boost the recycling levels.

The Environmental Fund Law introduced a target in 2010 to reduce the amount of municipal waste delivered to landfill by 15 %. Failure to meet the target by local authorities results in a fine of LEI 100 (approximately EUR 23) per tonne on the difference between the target and the actual achievement through selective collection and recovery. (BiPRO, 2012)

The steps which have been taken in Romania to improve recycling levels have thus far been very tentative. In the near future, a total of EUR 6.8 million will be invested by the European Bank for Reconstruction and Development in the Green Group, an integrated recycling park in Romania. The remaining EUR 16.7 million needed for this project will come from the Global Finance's South East Europe Fund (Lever, 2012). The park will have four subdivisions, responsible for collecting and recycling plastic, WEEE and fluorescent lamps (Business Insider, 2011).

Furthermore, Bucharest's city council intends to implement a mandatory selective recycling and waste collection scheme in the capital region (Lever, 2012). The cleaning company Romprest is going to invest EUR 12 million in a system that will enable selective collection, transport, and recycling of waste in Bucharest and Ilfov county. According to Romprest, new equipment will substantially improve the recycling level in the region, bringing it closer to European targets (Romania Insider, 2012).

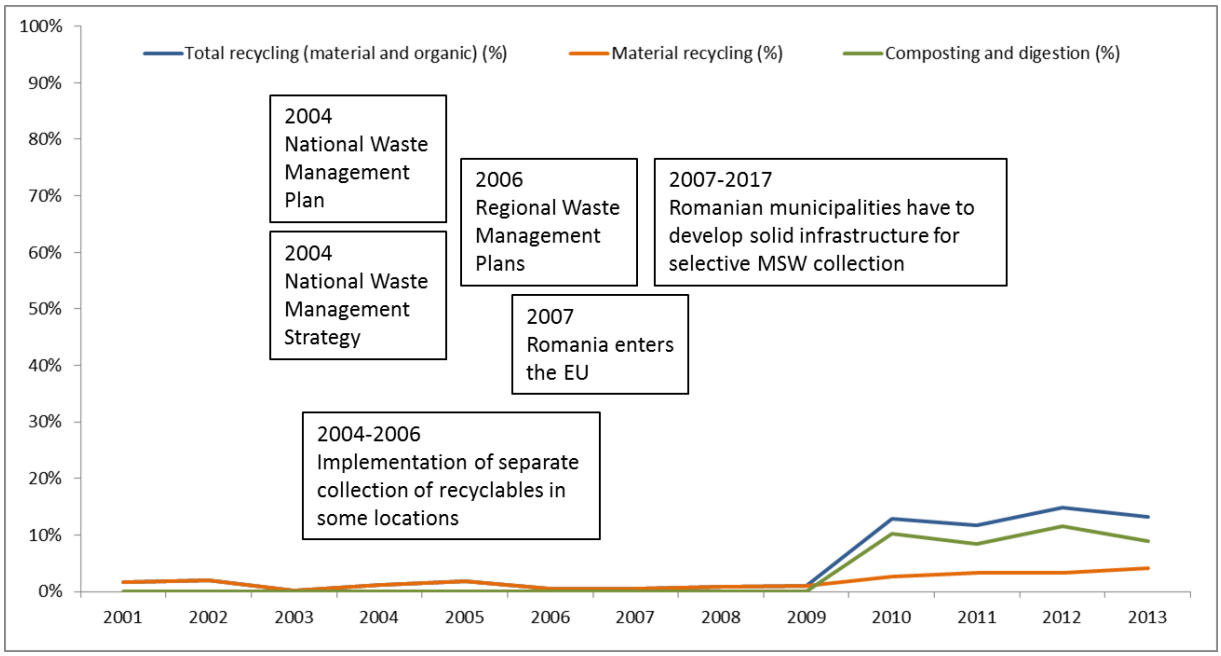
It was intended that 238 existing MSW landfills non-compliant with EU regulations were to be closed by 2013, and 65 compliant landfills/transfer stations were to be constructed, 50 with an average capacity of up to 100 000 tonnes per year and the other 15 with an average capacity of up to 50 000 tonnes per year (Atudorei, 2007).

Incineration is considered to be too expensive for the waste management market in Romania. Even so, plans for the integrated waste management system within the Bucuresti-Ilfov Region include the construction of the first municipal waste incinerator in Romania in the coming years. Interest in adopting such a technology has also been shown in the city of Brasov. (Larive Romania IBD SRL, 2011)

Co-incineration is well established in Romania since all cement kilns have invested in specific technology and have been authorised for the co-incineration of a wide range of waste fractions. It has been estimated that the co-incineration capacity in Romania and the potential demand for refuse

derived fuel (RDF) at the cement kilns is ten times higher than the currently available quantities. This represents an incentive within the sector to invest in selective collection and the production of RDF. (Larive Romania IBD SRL, 2011)

Figure 2.5 Romania, recycling of municipal solid waste and important policy initiatives, 2001–2013



2.4 Possible future trends

Romania is one of the countries that fulfil the criteria in Article 11(3) of the EU's WFD to receive a derogation period for the fulfilment of the 2020 target of 50 % MSW recycling. Nevertheless, Romania will have to speed up its efforts in recycling in order to achieve the target. Including some of the recycled packaging waste from MSW more systematically in the country's reporting will increase the recycling rate.

An exceptional effort from the regional and national Romanian authorities will be needed to increase the recycling level to 50 % by 2025 (derogation from the 2020 target year). To achieve this, there is a need for more detailed and concrete initiatives in the strategic documents that guide MSW management in the country. An important aspect, which could lead to improved results, is raising the level of awareness among citizens, who are not used to sorting their waste, even though the infrastructure is already in place in some Romanian cities. However, further instruments will also clearly be needed.

Approximately EU funding of EUR 300 million has already been assigned to improve MSW management in Romania, covering ten projects across ten counties. In 2011, applications for funding projects, requiring planned investment of EUR 730 million, in the remaining counties were in preparation. (Larive Romania IBD SRL, 2011)

Closure of all remaining non-compliant landfills for municipal waste is expected to be completed by 2017. Eleven new municipal waste landfills are planned, located in Braila, Bucharest, Constanta, Ilfov, Mures, Neamt, Prahova and Sibiu counties. (Arcadis, 2014)

Bucharest and Brasov municipalities have planned two public-private partnership (PPP) waste-to-energy plants, which are expected to be operational in 2020 (BiPRO, 2012).

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