

Municipal waste management in Bulgaria



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Context

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

Disclaimer

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

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Highlights

Most important factors/initiatives behind the development of MSW recycling in Bulgaria

- A very large proportion of the municipal waste is landfilled in Bulgaria. The amount of municipal waste deposited into landfills was 98 % of the generated amount in 2010.
- No material and organic recycling of municipal waste was reported in Bulgaria from 2001 to 2010. Packaging waste is not included in the reporting to Eurostat on the recycling of municipal solid waste in Bulgaria. Even if packaging waste would be included under the reporting of MSW recycling, it will require an exceptional effort for Bulgaria to fulfil the recycling target of 50 % by 2020.
- Considering the trends in the development of the amounts of landfilled BMW from 2007 to 2010, substantial efforts will have to be undertaken if Bulgaria shall fulfil the 50 % and 35 % targets of the EU Landfill Directive for diverting biodegradable municipal waste from landfill by 2013 and 2020.
- A landfill tax introduced in 2011 is envisaged to rapidly increase until 2014. Nevertheless the tax level is still considered as too low to effectively contribute to reducing the amount of municipal waste being sent to landfill.
- Mechanical biological treatment was introduced recently in Bulgaria. A National Strategic Plan for diversion of the biodegradable waste going to landfills 2010-2020 was adopted of late. The legal framework on bio-waste management is being developed under an international project.

1 Introduction

1.1 Objective

Based on historical MSW data for Bulgaria and EU targets linked to MSW in the Waste Framework Directive, 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;
- Relation of the indicators to the most important initiatives taken to improve MSW management in the country, and
- Assessment of the future possible trends and achieving of the future EU targets on MSW by 2020.

2 Bulgaria's MSW management performance

The Bulgarian Waste Management Act adopted in 2003 sets the responsibilities and the obligations of the state and local authorities in regard to the organization, authorization, financing, supervision and control of the waste management activities.

The new Waste Management Act, adopted in July 2012, introduced the EU Waste Framework Directive into the Bulgarian legislation, regulating the obligations of municipalities and the state for waste recycling.

The Bulgarian National Waste Management Programme for the period of 2003-2007, was actualised in 2008, already introducing the waste management hierarchy, the proximity principle and the 'producer responsibility' and 'polluter pays' principles.

The subsequent National Waste Management Programme covering the period of 2009-2013 sets the following strategic objectives: prevention and minimization of waste generation, increase of the quantity of recycled and recovered waste, improvement of the organization for separation, temporary storage, collection and transportation of the waste, environmentally sound waste disposal; legal regulation of waste management, provision of sufficient and reliable data for the waste, and strengthening of the administrative capacity and public participation.

With Bulgaria's accession to the European Union in 2007, new standards, procedures and requirements were planned towards activities related to waste production and treatment and towards operators performing such activities and services, the main purposes of their enforcement being to establish firm control mechanisms and to set up guarantees for better waste recovery and protection of the environment in general.

In 2001, the generation of municipal waste in Bulgaria was 4 million tonnes. Since then it has steadily decreased to 3.3 million tonnes by 2007. According to Eurostat it abruptly increased to 3.6 million tonnes in 2008, but by 2010 it dropped to 3.1 million tonnes. According to the Country specific notes on municipal waste data of Eurostat, the landfill site in Sofia was closed between October 2005 and

December 2007. This led to temporary storage of collected municipal waste in these years amounting to shares of the municipal waste generated between 2.5 % (2005) and 10 % (2006, 2007).

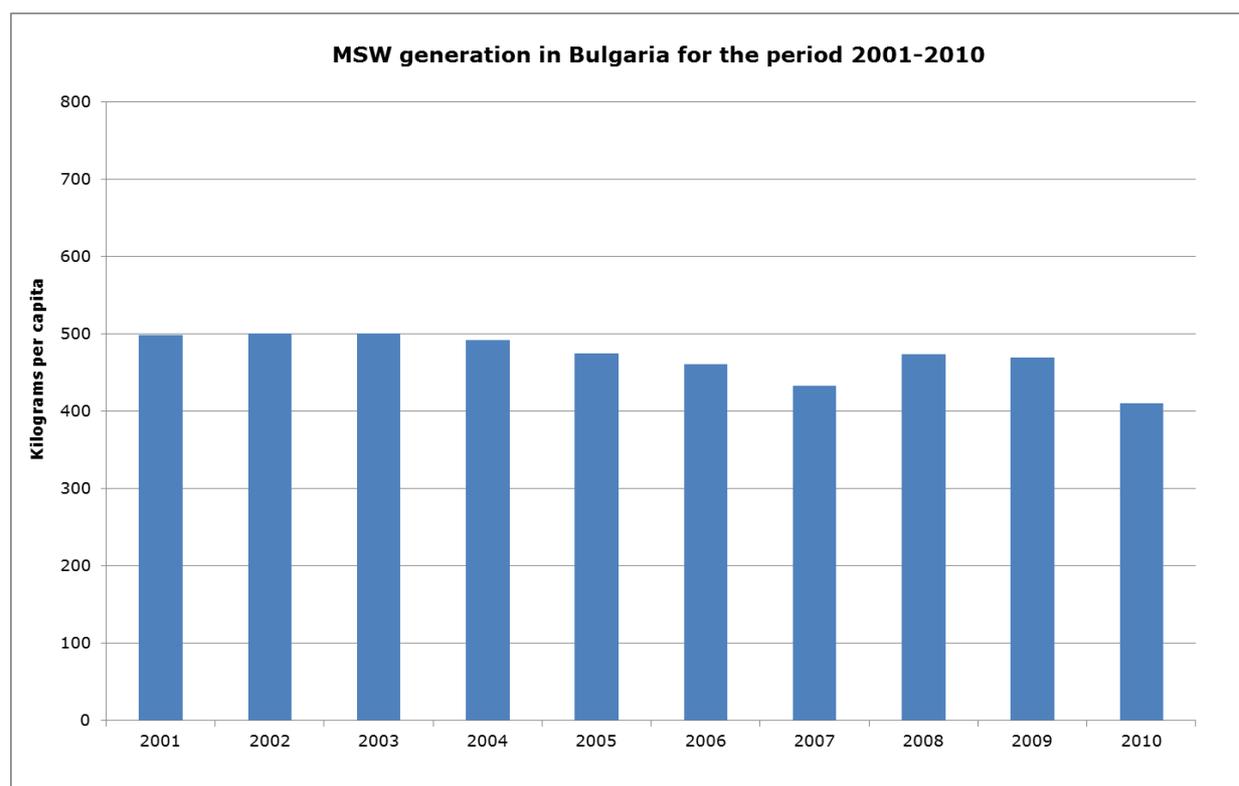
These amounts are not included in the figures for municipal waste generated and also caused a drop in municipal waste landfilled in 2006 and 2007, which explains the sudden increase from 2007 to 2008.

2.1 MSW Indicators

A very large proportion of the municipal waste in Bulgaria is landfilled. The amount of municipal waste deposited into landfills was 3 million tonnes in 2010, representing 98 % of the generated amount (3.1 million tonnes). In 2005, a significantly smaller proportion of the generated amount was landfilled; the landfilled amount was 3.1 million tonnes and represented only 85 % of the generated amount (3.7 million tonnes). The difference between the generated and the landfilled amount (that in accordance with the Eurostat statistics equalled the treated amount of municipal waste) was 536 000 tonnes in 2005. It can be assumed that it equals the estimated amount to be generated in regions without MSW collection services.

Figure 2.0 shows the development of MSW generation per capita in Bulgaria from 2001 to 2010. There has been a decrease in MSW generation per capita during the period.

Figure 2.0 MSW generations per capita in Bulgaria



Source: Eurostat, 2012

2.1.1 The recycling of MSW from 2001 to 2010

According to the Eurostat data no material and organic recycling of municipal waste was reported by Bulgaria from 2001 to 2010.

In Bulgaria packaging waste is not included in the reporting to Eurostat on the recycling of municipal solid waste (cf. section 2.2). The composition of the recycled packaging waste is shown in Table 2.1.

There has been a significant increase in the packaging waste recycling from 2004 to 2010. The largest proportion of recycled packaging waste is linked to paper and cardboard.

Table 2.1 Composition of recycled packaging waste in Bulgaria in 2004, 2006, 2008 and 2010. Stated in tonnes

	2004	2006	2008	2010
Total packaging waste recycling	100 610	129 129	152 057	197 958
Plastics	7 622	17 996	12 084	33 553
Paper/cardboard (including composites)	74 898	65 770	73 945	113 543
Metals	5 875	1 498	11 806	8 052
Wood	-	-	2 827	10 074
Glass	12 215	43 767	51 395	32 735
Other	-	98	-	-

Source: (Bulgarian National Statistical Institute, 2012)

2.1.2 The yearly increase rate of recycling of MSW

As Bulgaria has reported to Eurostat that no MSW has been recycled from 2001-2010, the yearly increase rate from 2001 to 2010 cannot be indicated neither can it be projected from 2010 to 2020 based on the previous period. Since Bulgaria reported 0 % recycling for 2010, in order to achieve the 50 % recycling target for MSW by 2020¹ it will require that the recycling rate increases on an average annually with five percentage points from 2010 to 2020. Such a yearly increase rate has not been achieved by any European country in the period from 2000 to 2010. Even if packaging waste was included in the reporting to Eurostat on the recycling of municipal solid waste, it will require an exceptional effort in Bulgaria to fulfill the recycling target of 50 % by 2020.

It is likely that some recent initiatives taken after 2010 by the Bulgarian government (the Waste Management Act, adopted in July 2012; the National Waste Management Programme for the period 2009-2013; the National Strategic Plan for diversion of biodegradable waste going to landfills 2010-2020, and Decree No 207/16.09.2010 on landfill tax, adopted in January 2011) will contribute to improve the recycling rate in the country.

2.1.3 Landfilling of biodegradable municipal waste

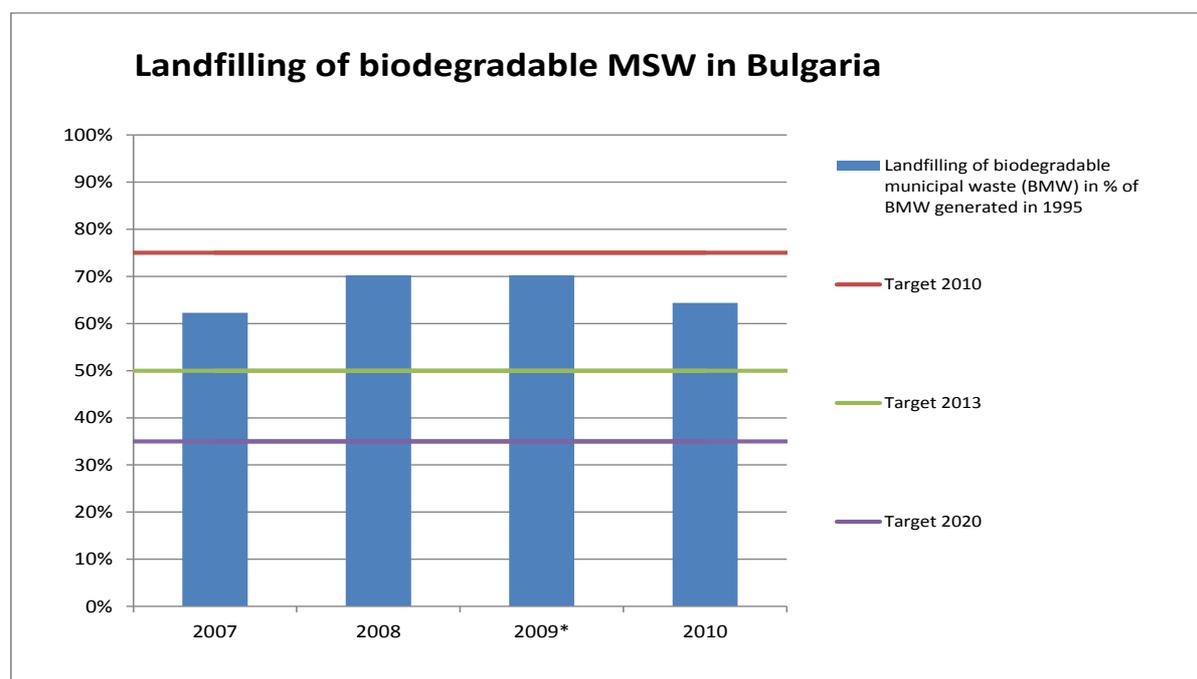
It is a general requirement of the EU Landfill Directive that all Member States have to reduce the amount of biodegradable municipal waste landfilled (BMW) by a certain percentage by 2006, 2009 and 2016. However, Bulgaria has benefited from a four year derogation period. The targets are related to the generated amount of BMW in 1995 (2 248 000 tonnes).

Bulgaria has reported its landfilled amount of BMW to the European Commission for the years 2007 and 2008. In Figure 2.3 the amount of biodegradable MSW landfilled in 2009 has been estimated to be the same as the 2008 figure, because there was no increase in composting from 2008 to 2009. Bulgaria has reported to the ETC/SCP the figure for 2010 (Bulgaria, 2012).

¹ The EU's updated Waste Framework Directive in 2008 (EU, 2008) includes a new 50 % recycling target for waste from households, to be fulfilled by 2020. In 2011, the European Commission decided that countries can choose between four different calculation methods to report compliance with this target. One of these methods is to calculate the recycling rate of MSW as reported to Eurostat (EC, 2011).

In 2007, the landfilled amount was 1 400 000 tonnes, equivalent to 62 % of the generated amount in 1995.

Figure 2.3 Landfilling of biodegradable MSW in Bulgaria



Source: EC, 2012 and Bulgaria, 2012. *The figure for 2009 is estimated by Copenhagen Resource Institute (CRI). The target dates take account of Bulgaria's 4 year derogation period.

The amount of landfilled BMW increased by 8 % to 1 579 000 tonnes from 2007 to 2008. For 2010, the percentage of landfilled BMW is estimated to be 65 %, which is below the 2010 target of the Landfill Directive (cf. Figure 2.3).

Figure 2.3 also indicates that, considering the trends in the development of the amounts of landfilled BMW from 2007 to 2010, substantial efforts will have to be undertaken if Bulgaria shall fulfil the 50 % and 35 % diversion targets of the EU Landfill Directive by 2013 and 2020.

2.1.4 Regional differences of MSW recycling from 2001 to 2010

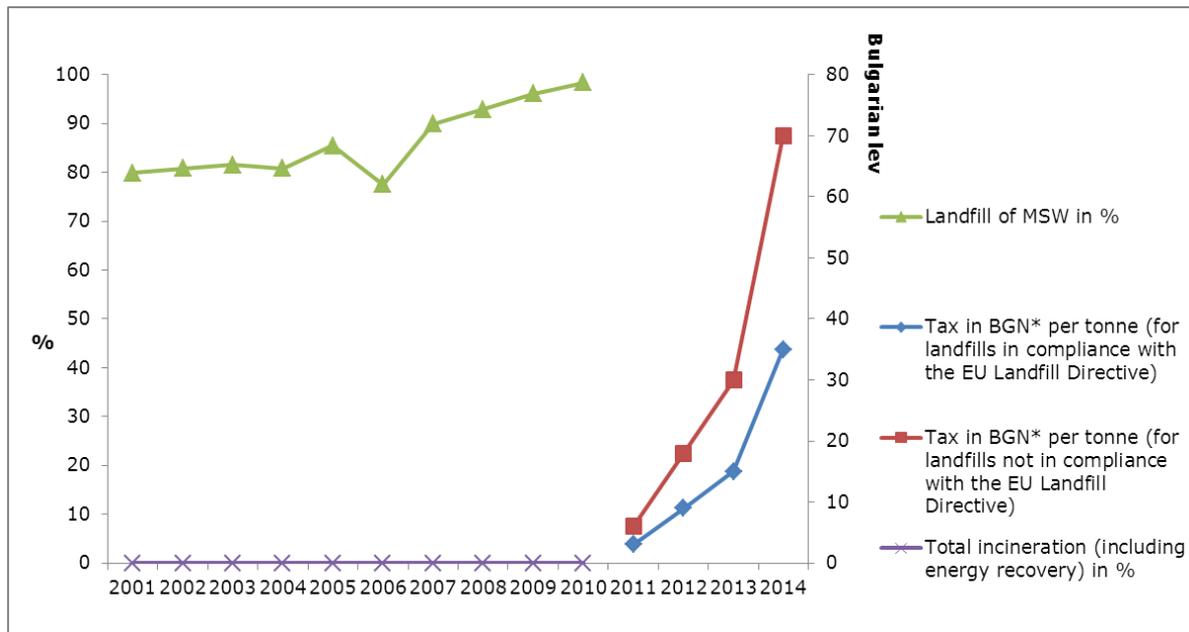
There are no regional data available for Bulgaria on recycling of MSW.

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

A landfill tax was introduced for municipal waste in Bulgaria in 2011. In line with the Waste Management Act and the Decree No. 207/16.09.2010 on Landfill Tax it will gradually increase over the years. In 2011 it was EUR 1.5/t, by 2012 it reached EUR 4.6/t and it is expected to be at 7.7 and 17.9 EUR/t respectively in 2013 and 2014 (ExEA, 2012).

The effects of the tax on the level of landfilled MSW cannot be assessed as data on the generated and treated amounts are only available until 2010. There is no waste incineration plant in the country.

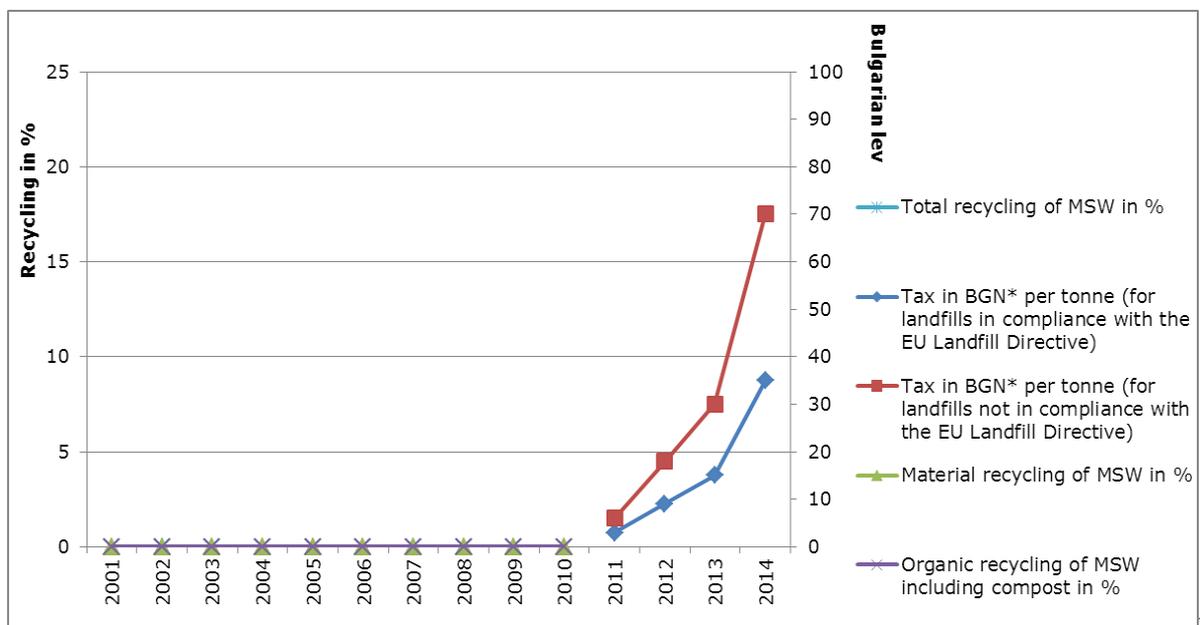
Figure 2.5 Development of landfilling and incineration of MSW and landfill tax in Bulgaria



* 1 € = 1,9558 Bulgarian lev (2011 annual average currency exchange rate) Source: ETC/SCP, 2012 and Eurostat, 2012

Figure 2.5 indicates that the landfill tax is envisaged to rapidly increase from 2011; still it is considered too low to effectively contribute to reduce the amounts of municipal waste being sent to landfill (EC, 2012).

Figure 2.6 Development of MSW recycling and landfill tax in Bulgaria



1 € = 1,9558 Bulgarian lev (2011 annual average currency exchange rate). Source: ETC/SCP, 2012 and Eurostat, 2012

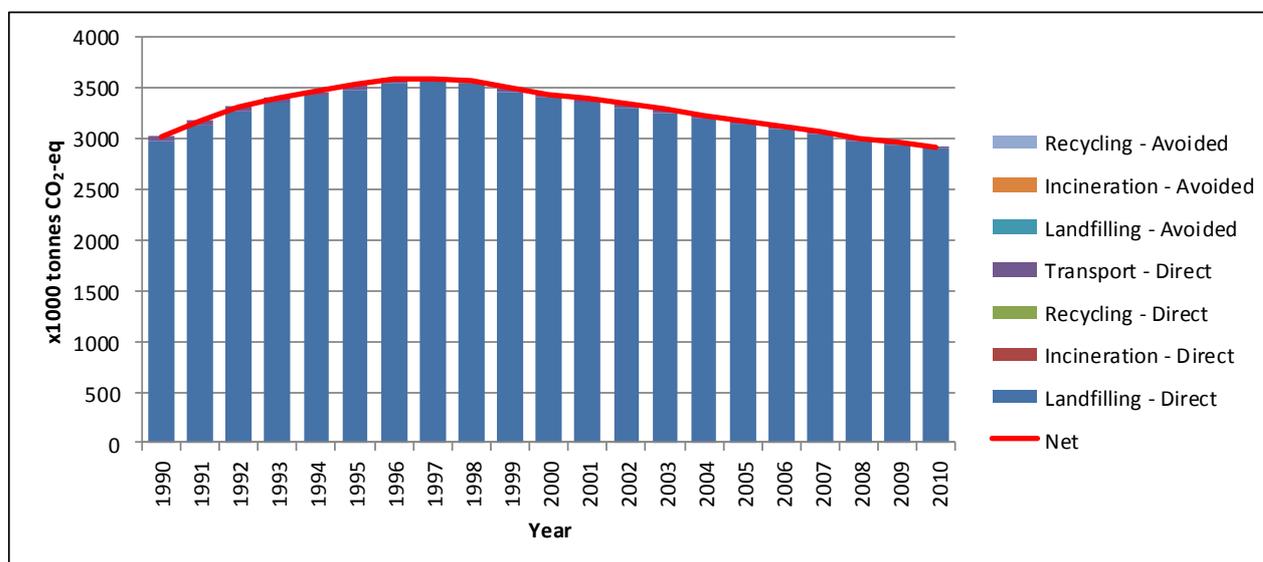
2.1.6 Environmental benefits of better MSW management

Figure 2.7 shows the development of GHG emissions from MSW management, calculated by using a life-cycle approach. The graph shows the direct emissions, the avoided emissions and the net emissions of the MSW management. However, avoided emissions are zero because there was no recycling and no incineration in Bulgaria.

Figure 2.7 shows that the direct emissions as well as the net emissions from municipal waste management peaked after a robust increase until 1996-1997. Since then a slow and gradual decrease is calculated. In Bulgaria direct emissions from MSW are almost exclusively resulting from landfilling.

Although the amount of landfilled municipal waste nearly remained on the same level in 2010 compared to that of 2001, the emissions from landfilling municipal waste decreased more significantly in the same period indicating improved landfill operation and the strengthening of control by the municipal administrations.

Figure 2.7 GHG emissions from MSW management Bulgaria²



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

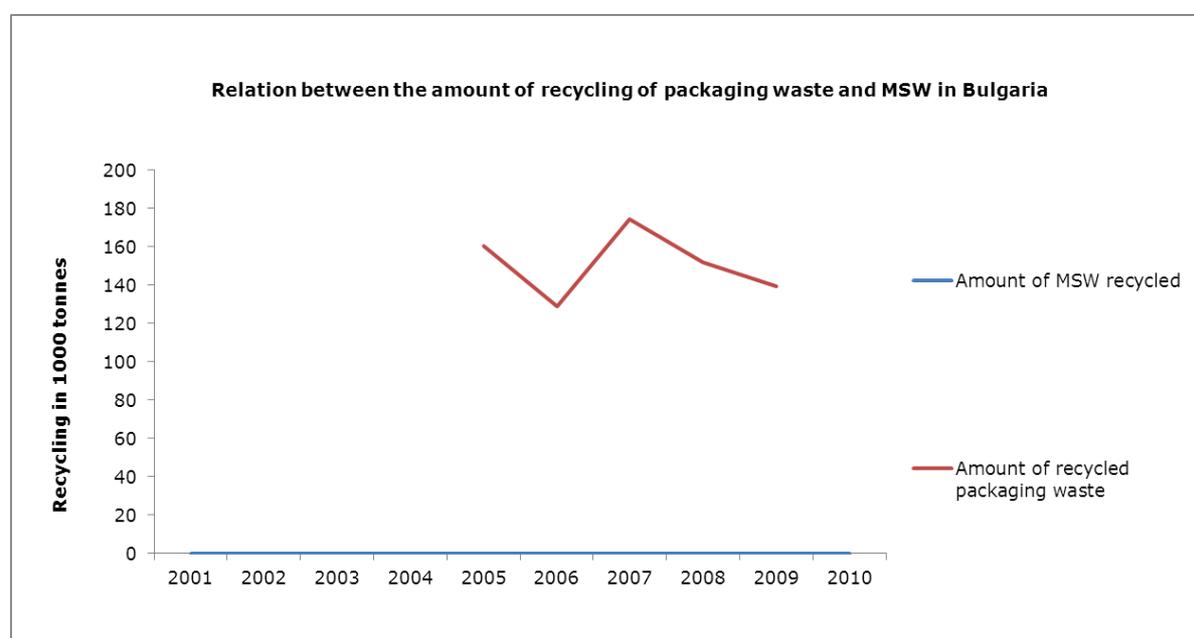
² All the GHG emissions (positive values) represent the direct operating emissions for each waste management option. These direct operating emissions have been calculated with the use of the IPCC (IPCC, 2006) methodology for landfills and life cycle modelling for the other technologies (incineration, recycling, biotreatment and transport). For the indirect avoided emissions (negative values), the calculations integrate the benefits associated with the recovery of energy (heat and electricity generated by incinerators, electricity generated by the combustion of landfill gas or methane from anaerobic digestion). Other avoided emissions include the benefits of recycling of food and garden waste, paper, glass, metals, plastics, textiles and wood in the municipal solid waste. Recycling is here assumed to include material recycling and biotreatment. Avoided emissions of biotreatment include fertilizer substitution. All processes generating electricity are assumed to substitute electricity mix of Bulgaria in 2009. Processes generating heat are assumed to substitute average heat mix for the EU25 in 2002. The electricity mix and heat mix are assumed to remain constant throughout the whole time series. The compositions of the MSW disposed in landfills, incinerated or recycled respectively are based on Bakas et al., 2011. The complete methodology is available from (ETC/SCP, 2011).

2.2 Uncertainties in the reporting

Some uncertainties or differences in the reporting of MSW can result in different levels of recycling. One example of such differences which might influence the recycling rate of MSW in Bulgaria is to what extent packaging waste from households and similar packaging from other sources is included in the reported recycling of MSW. Most EEA Member Countries, including Bulgaria, have producer responsibility schemes for packaging waste. Private operators of these schemes do not always report on the sources of the recycled packaging waste, and therefore packaging waste is not always reported to Eurostat as MSW.

As indicated by Figure 2.8, while the amount of recycled packaging waste was in the range of 130 000 and 175 000 tonnes between 2005 and 2009, no material and organic recycling of MSW including compost was reported by Bulgaria in the same period.

Figure 2.8 A comparison between recycled MSW and recycled packaging waste



Source: Eurostat, 2012

Bulgaria has opted for a reporting method where recycled packaging waste is not included in the reporting to Eurostat on the recycling of municipal solid waste (ExEA, 2012). There is no information about how much of the recycled packaging waste is from households and similar sources, but material recycling of MSW in Bulgaria would have been at 4.2 % in 2008 and at 3.9 % in 2009 if all packaging waste had been reported as recycled MSW. It can be assumed that at least a part of the recycled packaging waste is from households. Consequently, some of the MSW is recycled in Bulgaria, albeit at a very low level, but it is not indicated due to the specific way of reporting.

Another factor for uncertainty could be that in some countries the whole amount of MSW sent to Mechanical Biological Treatment (MBT) is allocated to recycling at the MBT plant. As Mechanical Biological Treatment is an entirely new practice to the country, such amounts do not appear in the reporting but attention should be paid to this issue in the future as Bulgaria is currently introducing MBT.

2.3 Important initiatives taken to improve MSW management

At the end of 2002 the organized municipal waste collection had covered only 80 % of the population of Bulgaria (NWMP 2003-2007, 2002).

In late 2006, already 90 % of the population was served by municipal waste collection systems in the country. Despite the fact that 100 % of the urban population in Bulgaria was covered by the services that time, only less than 40 % of the rural population was served by the collection system (NWMP 2009-2013, 2009). By 2010, the share of population covered by municipal waste collection systems reached 98.15 % (ExEA, 2012).

In 2001, 2 500 landfills were observed by the regional environmental inspectorates in Bulgaria out of which 124 were controlled and only 9 met the EU standards (REC, 2001).

The closing down and rehabilitation of non-compliant landfill sites and the elimination of illegal dumpsites are still in progress in the country.

In line with the National Waste Management Programme for 2009-2013, a system of 58 new and modern regional landfills together with pre-treatment facilities is envisaged in Bulgaria. In 2010, the construction of open municipal sites has started for the composting of separately collected 'green' waste from parks and gardens. In 2011, construction of 23 regional biowaste composting facilities has started, financed by the Environment Operational Program (ExEA, 2012).

In 2001, the collection of waste for recycling such as paper, glass, plastic and metals was limited to buying back of separate collected waste from the population or collection of waste generated by different manufacturers. The collection was organized independently of the municipal systems for municipal waste collection on the basis of buying back centres, and linked to periodic campaigns (NWMP 2003-2007, 2002).

The system of separate collection of packaging waste was introduced in Bulgaria in 2004. Back then, only slightly more than one third of the generated packaging waste was recycled, and by 2010 this proportion reached 61.6 % (NSI, 2012).

The first Mechanical Biological Treatment plant in Bulgaria started its pilot operation in 2009 in the city of Plovdiv with a total capacity of 125 000 tonnes. Composting of MSW is reflected only in the 2011 reporting of MSW in Bulgaria. According to the data from the Bulgarian National Statistical Institute (NSI) the quantity of composted MSW from in the MBT plant of Plovdiv was approximately 90 000 tonnes. In 2011, the pilot operation of another MBT plant started in Bulgaria in the region of Varna (ExEA, 2012).

As a means of deterrent against disposal, a landfill tax was introduced for municipal waste in Bulgaria in 2011. The level of the landfill tax is doubled for the disposal of waste in non-compliant landfills (ExEA, 2012).

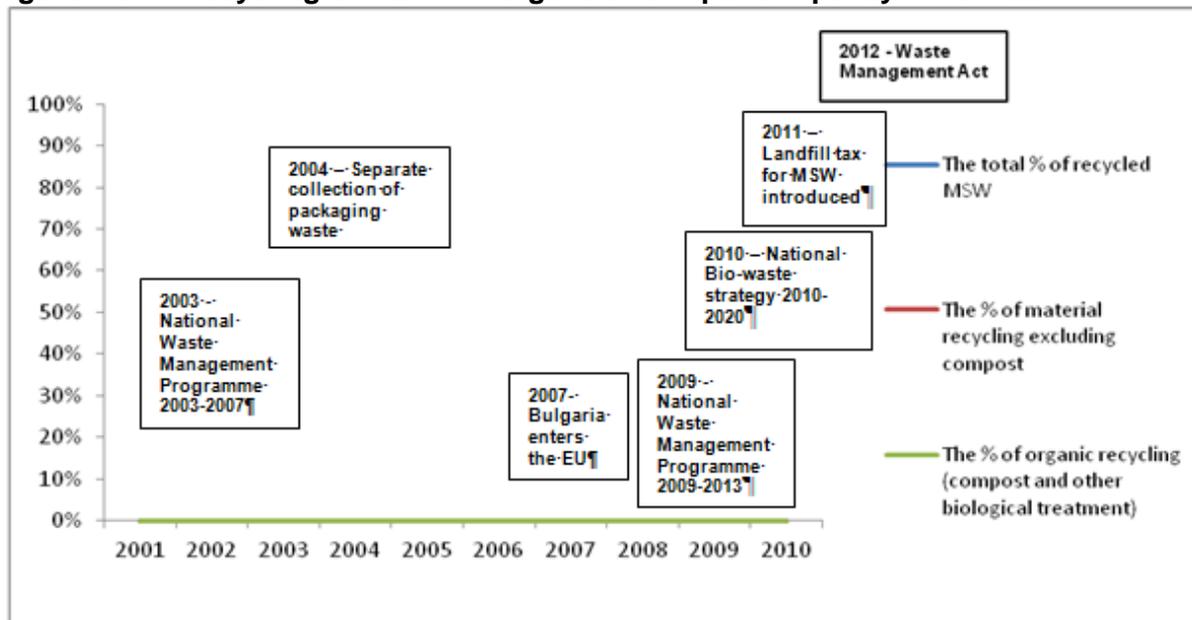
The Ministry of Environment and Water (MOEW) is responsible for the development and implementation of the national waste management policy, including drafting and enforcement of the legislation, strategies, programmes, as well as regulation of the activities in the public and private sectors (ETC/SCP, 2009).

The Ministry performs some of these activities by the Executive Environmental Agency (EEA) and the network of the regional competent authorities, the Regional Inspectorates of Environment and Water (RIEW), which control the implementation of the waste management legislation (ETC/SCP, 2009).

The organization and treatment of waste within the territory of the municipalities is the responsibility of the municipal mayors. Commonly, mayors assign those activities through awarding of public procurements.

Municipalities in Bulgaria that build or use a common regional landfill or treatment facility with regional character, establish regional associations as legal entities, or enter into an agreement with each other on waste management on a regional basis (NWMP 2009-2013, 2009).

Figure 2.9 Recycling of MSW in Bulgaria and important policy initiatives



2.4 Future possible trends

Considering the current level of material and organic recycling of MSW in Bulgaria, exceptional efforts will be required for fulfilling the 50 % recycling target by 2020. A certain proportion of the recycled packaging waste from MSW sources could be reported as recycled MSW (cf. section 2.2).

The landfill tax, introduced in 2011, is envisaged to gradually increase from the entry level of 1.5 EUR/t to 17.9 EUR/t by 2014.

The recycling sector is rapidly expanding in Bulgaria. Major investments into construction of pre-treatment facilities and installations for waste separation are envisaged to be directed from the Operational Programme Environment 2007-2013 (NWMP 2009-2013, 2009). The European funds are planned to be complemented by state and municipal budget as well as from loan funding from the World Bank, EBRD, and EIB. Funds for home composting will be provided by the Environmental Protection Fund. In 2012, the construction of an MBT and composting plant is going to start in Sofia (ExEA, 2012).

The Bulgarian Ministry of Environment and Water has adopted a National Strategic Plan for diversion of biodegradable waste going to landfill during the period of 2010-2020, to facilitate a gradual reduction of the amount of municipal biodegradable waste going to landfill. In addition, the development of the entire legal framework on bio-waste management is planned under an international project in cooperation with Austria (ExEA, 2012).

It is likely that some recent initiatives taken after 2010 by the Bulgarian government (the Waste Management Act, adopted in July 2012; the National Waste Management Programme for the period 2009-2013; the National Strategic Plan for diversion of the biodegradable waste going to landfills

2010-2020, and Decree no 207/16.09.2010 on landfill tax, adopted in January 2011) will contribute to an improvement in the recycling rate in the country. However, it must be stressed that Bulgaria will need to make an exceptional effort in order to fulfil the 50 % target of the Waste Framework Directive by 2020.

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