

# Municipal waste management in Hungary



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**Context**

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# Highlights

## Most important factors and initiatives in Hungary

- The country's performance in terms of MSW recycling has been improving dramatically over the last decade from close-to-zero (2 % in 2001) to 21 % in 2010, while at the same time MSW generation has decreased by 13 % and decoupled from economic growth over 2001-2010.
- If the increase rate for recycling of the last 5 years can be maintained, then the recycling rate would reach 47 % in 2020 which is slightly under the 50 % target set in the EU legislation for 2020.
- The Hungarian waste strategy has focused on building capacity and setting up schemes for separate collection, mainly for packaging waste since 2001.
- The First National Waste Management Plan 2003–2008 sets targets on reducing BMW going to landfill in line with the EU Landfill Directive, and the first two interim targets have been met.
- In order to meet the 2016 diversion target of the Landfill Directive there is a need for additional waste treatment capacity. This is complicated by the dead-lock caused by the generally negative public attitude both towards any initiatives on new waste incineration plants and waste-derived products, especially compost.
- The Second National Waste Management Plan for 2009-2014 has not been officially approved, thus there is no NWMP in place.
- A National Waste Management Agency (OHÜ) was established in early 2012. This Agency will act as a single national coordinator between the collection companies and the treatment plants.
- The government has decided to implement a landfill tax from 2013. The tax per tonne of MSW landfilled will be EUR 10.5 from 2013 and will reach its intended level of EUR 42 from 2016.

# 1 Introduction

## 1.1 Objective

Based on historical MSW data for each country and EU targets linked to MSW in the Waste Framework Directive, the Landfill Directive and the Packaging Directive, the analysis undertaken for Hungary 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 Hungary's MSW management performance

For decades, the dominant treatment of municipal waste in Hungary was landfilling. Before 1989, municipal waste management was not subject to extensive regulations and focused only on hazardous wastes and collection of municipal waste from households.

In the past, almost all municipalities operated one or more landfill sites, generally not constructed and equipped with technologies of modern waste management. These sites were basically waste dumps operated by the local councils at that time.

Hungary entered the EU in 2004, and thus the national waste management policy priorities have been mainly driven by the EU waste legislation since the late 1990's. The legal basis for preparing National Waste Management Plans (NWMP) was introduced in the Hungarian legislation in year 2000 with the Act on Waste Management.

National waste management plans are defined for six years according to the legislation. The first National Waste Management Plan was valid for the period of 2003-2008, but since then, the second National Waste Management Plan was not officially accepted for the next planning period (2009-2014).

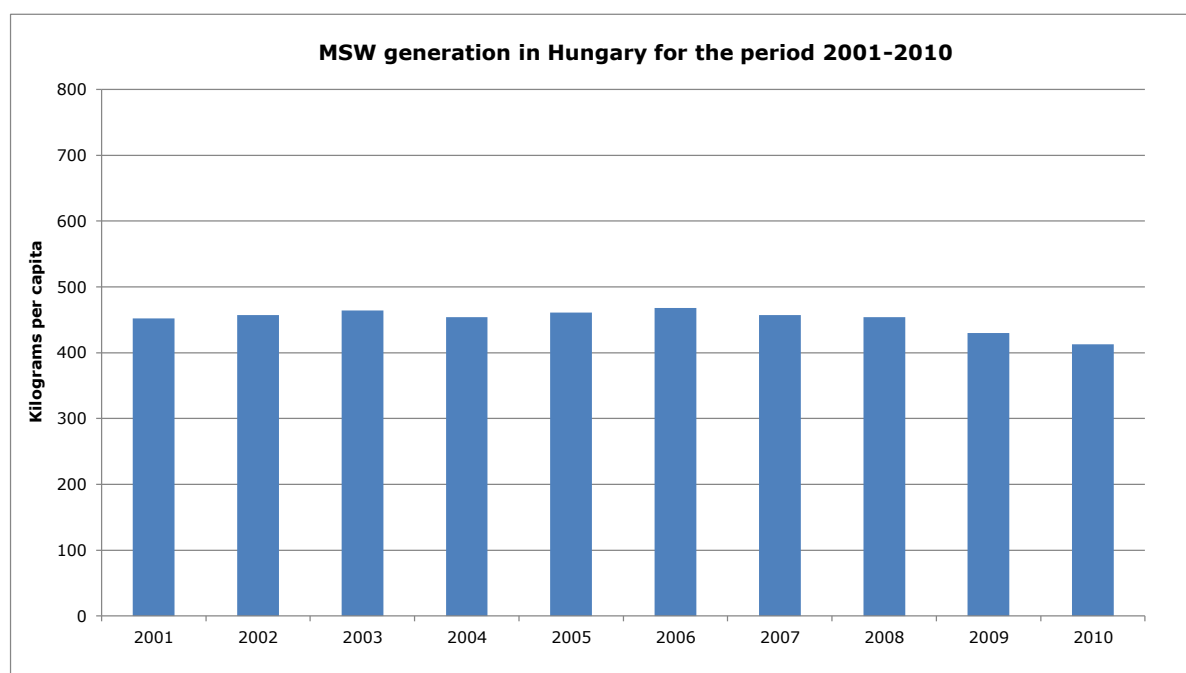
Furthermore, in line with the overall goals of the first NWMP, two strategy papers (relevant to this assessment) have been prepared: the Strategy for the Management of Biodegradable Waste in Municipal Solid Waste Management 2004-2016 and the Development Strategy for Municipal Solid Waste Management, 2007-2016. These documents serve as the basis of future developments for the treatment of MSW.

## 2.1 MSW Indicators

Over 10 years, the annual amount of MSW generated in Hungary has decreased by 13 %, i.e. from 4.6 in 2001 to 4.1 million tonnes in 2010. From this amount, around 62 % is household waste and the rest is similar waste generated by institutions, service providers, and businesses.

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

**Figure 2.0 MSW generations per capita in Hungary**



Source: Eurostat, 2012

It must be noted that the general data availability and quality for municipal waste for pre-2004 time series is considered to be poor. It must be stressed that before 2004 when the new Waste Management Information System (HIR) was launched, the only available data was based on estimations and non-continuous data collections, and not considered to be precise by the experts in Hungary (ETC/SCP, 2008). Therefore, data is claimed to be more accurate and reliable from 2004 onwards.

However, in spite of changing the data collection methodology, the overall trend in MSW generation does not seem to be broken, meaning that there was a decoupling between the increase of GDP and the amount of MSW generated over this time period.

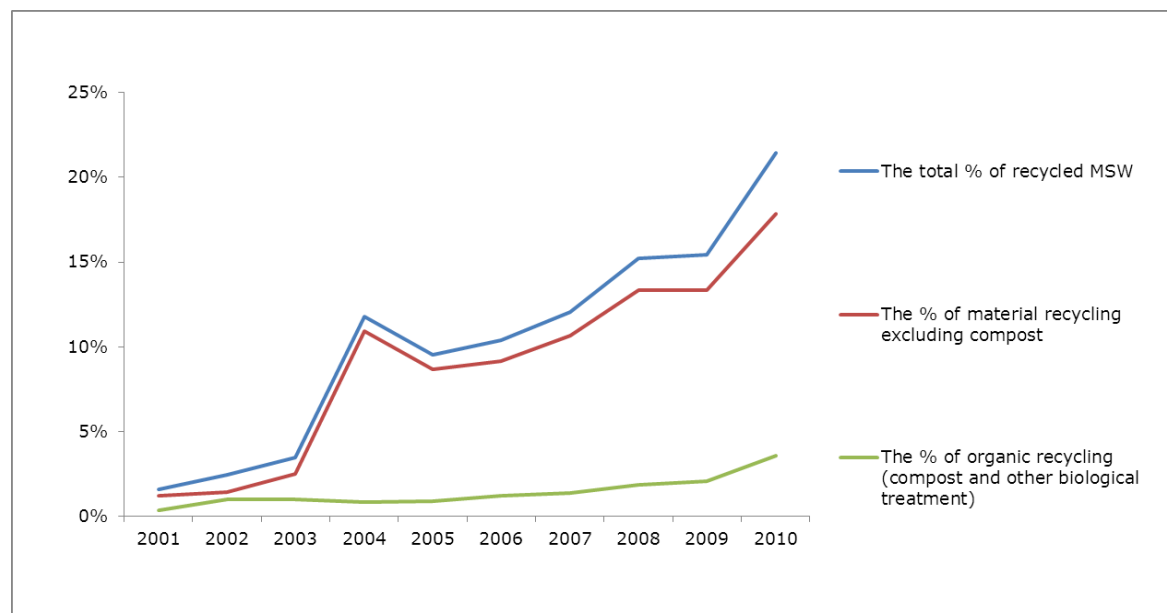
### 2.1.1 The recycling of MSW from 2001 to 2010

It is estimated that the MSW contains around 13.5 % paper, 20 % plastics, 5.9 % glass and 6.4 % metal (Balatoni, 2012) in Hungary, and around 52 % of the MSW is biodegradable (ETC/SCP, 2008).

The country's performance in terms of MSW recycling has been improving dramatically over the last decade from close-to-zero (2 % in 2001) to 21 % in 2010. The majority, 18 percentage point was material recycling (including metal, glass, plastic, paper and cardboard, but excluding composting), while composting and other biological treatment together accounted for only about 4 percentage point out of the 21 %.

Although progress in improving material recycling has already been achieved, any sign of progress with organic recycling is yet to be seen.

**Figure 2.1 Recycling of MSW in Hungary**



Note: Percentages are calculated as % of generated MSW  
Source: Eurostat, 2012

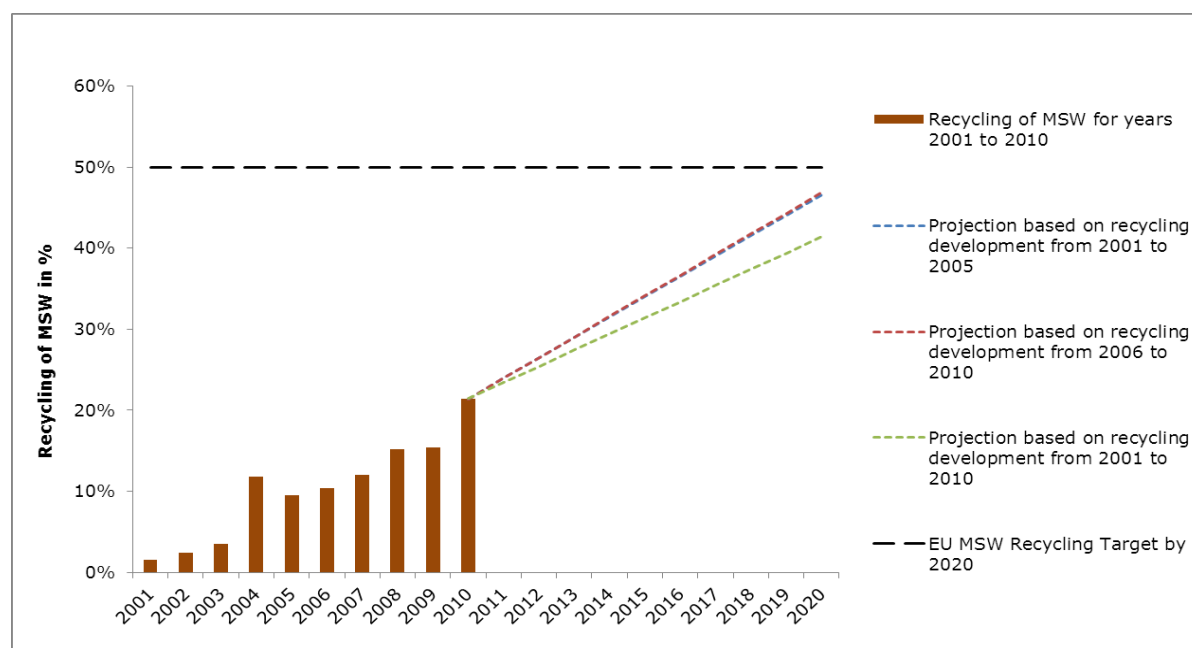
### 2.1.2 The yearly increase rate of recycling of MSW

Figure 2.2 shows how the level of MSW recycling has changed in Hungary per year during the last decade. The indicator presented below shows that the country has improved its performance recently, and if the increase rate for recycling of the last 5 years can be maintained, the recycling rate would reach 47 % in 2020 which is slightly under the 50 % target set in the EU legislation for 2020<sup>1</sup>.

In order to assess the prospects for meeting the 50 % recycling target as set out in the Waste Framework Directive, three scenarios have been calculated. The scenarios assume that recycling in the period 2010 to 2020 develops, based on a linear regression, with the increase rates of recycling in the periods 2001-2005, 2006-2010 and 2001-2010.

<sup>1</sup> EU's updated Waste Framework Directive from 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).

**Figure 2.2 Future recycling of MSW in Hungary**



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

It has to be kept in mind that these three scenarios are very simplistic and do not take into account any planned policy measures. In addition, they are based on one calculation methodology for recycling of municipal waste (MSW recycled/MSW generated, using data reported to Eurostat), whereas countries may choose to use another methodology to calculate compliance with the 50 % recycling target of the Waste Framework Directive. The scenarios in Figure 2.2 should therefore be interpreted only as to give some rough indications and assessment of the risk of missing the target.

### 2.1.3 Landfilling of biodegradable municipal waste

According to the EU Landfill Directive, it is a general requirement that Member States have to reduce the amount of biodegradable municipal waste landfilled (BMW) by 2006, 2009 and 2016. The targets are related to generated amount of BMW in 1995, in which year Hungary generated close to 2 million tonnes of BMW, consisting of 1.17 million tonnes of biowaste and 765 000 tonnes of paper waste.

Unlike some other new Member States, Hungary has no derogation period to achieve the targets and interestingly, when the Landfill Directive was transposed to the national legislation, the national legislation set the following interim reduction targets: 75 % by 2004, 50 % by 2007 and 35 % by 2014, in percentage of the amount produced in 1995. Thus, the Hungarian targets were originally set two years ahead of the Landfill Directive targets (ETC/SCP, 2008).

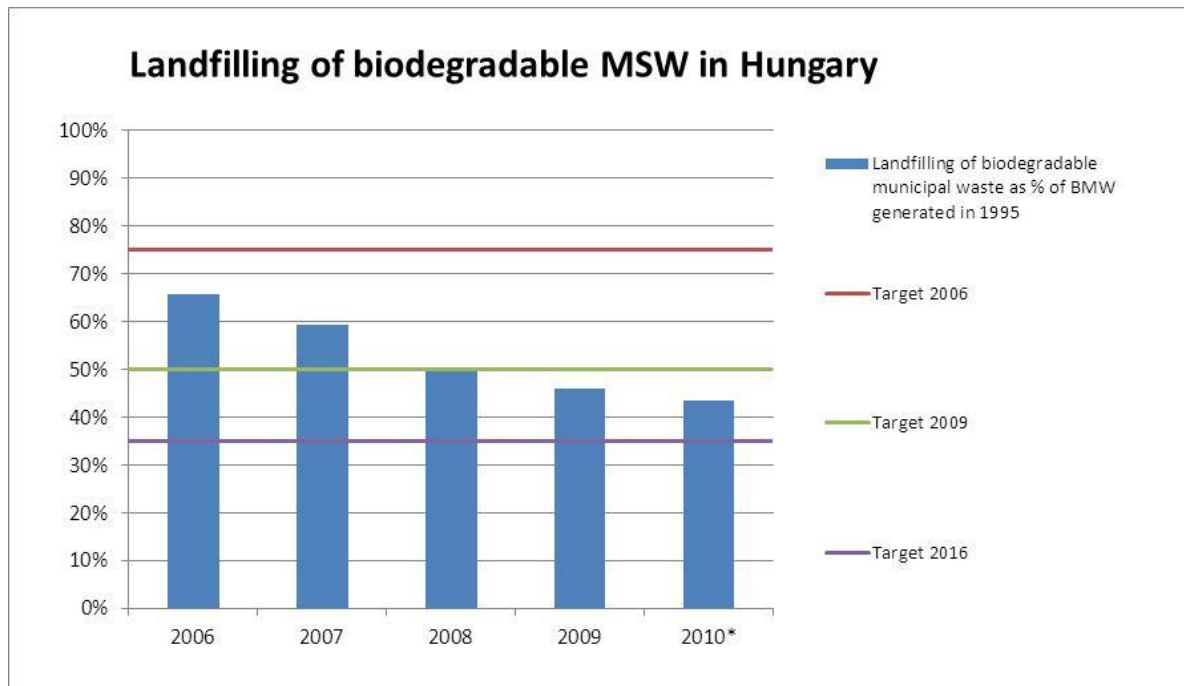
However a modification – in light of the developments achieved until 2007 – was made on the Act on Waste Management in 2007, so as from January 2008 the latter two targets have been set for 2009 and 2016 in accordance with the Landfill Directive.

As presented in Figure 2.3 below, there are only reported figures available so far for 2006-2009 (EC, 2012) while the figure for 2010 is estimated by the Copenhagen Resource Institute using the model it has developed for the ETC/SCP. In Figure 2.3 the amount of landfilled BMW in 2010 has been calculated by subtracting the increase in amount of MSW going to composting and digestion (Eurostat, 2010) in 2009 to 2010 from the amounts of BMW being landfilled in 2010.



Hungary has made rapid progress towards diversion of BMW from landfill. Interim targets set for 2006 and 2009 by the Landfill Directive, were met with achieving a reduction to 66 % in 2006 and 46 % in 2009, mainly due to a dramatic increase in material recovery, MBT and due to an improved separate paper (and packaging paper) collection system.

**Figure 2.3 Landfilling of biodegradable municipal waste in Hungary as % of BMW generated in 1995**



Source: EC, 2012 and CRI calculation\*. The figures for 2010 are CRI estimations. The target dates take account of Hungary's 4 year derogation period.

#### 2.1.4 Regional differences of MSW recycling from 2001 to 2010

Regional data is only available for the year 2008. Figure 2.4 therefore shows regional differences in MSW recycling for 2008 related to total recycling, material recycling and organic recycling based on data reported to Eurostat. For each type of recycling three different regions have been chosen:

- Recycling in the region with the highest total generated amount of MSW in 2008
- Recycling in the region with the lowest percentage of recycling in 2008
- Recycling in the region with the highest percentage of recycling in 2008

The figures present data on: the total % of recycled MSW, the % of material recycling excluding compost and the % of organic recycling (compost and other biological treatment).

It is interesting to note that in Figure 2.4 below these criteria resulted in the inclusion of six out of the seven Hungarian regions, suggesting a rather scattered picture nationwide. The geographic location of the regions is therefore illustrated below.

## Map 2.1 Regions in Hungary



The population of most regions is around 1.0-1.5 million, while it is (and the population density as well) higher in the central region around Budapest in the Közép-Magyarország (Central Hungary) region, with 3.0 million people out of the 10.0 million in total with a MSW generation of 1.5 million tonnes, about the triple of the average of other regions, responsible for a third of the municipal waste generated in the country.

This is also by far the most developed region of the country, its GDP per capita is 110 % that of the EU27 average, (and 145 % in Budapest, while the 6 other regions' figures reach only between 40 % (Észak-Alföld, Dél-Alföld) to 60 % (Közép-Dunántúl, Nyugat-Dunántúl) of the EU average according to Eurostat data.

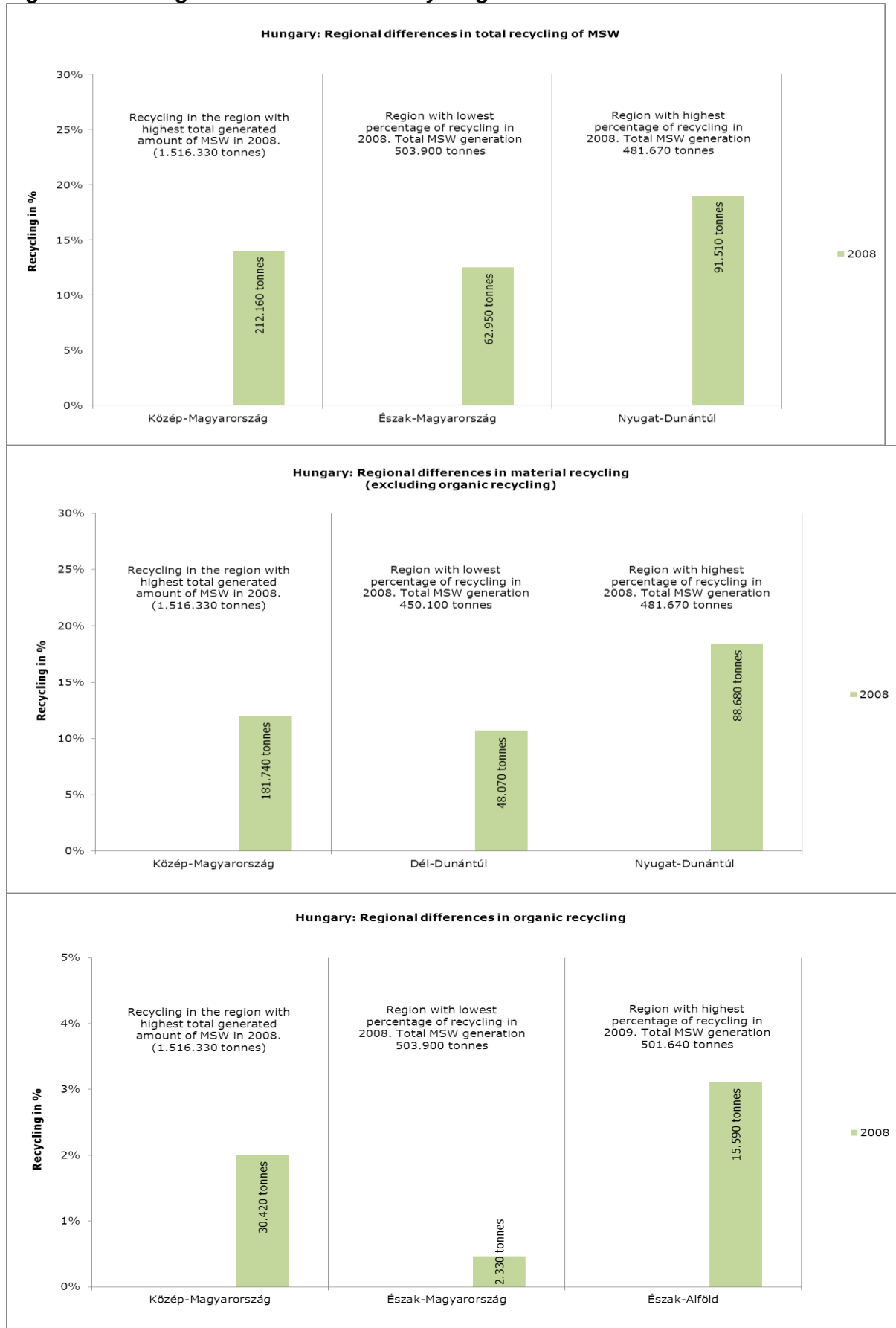
The Közép-Magyarország region is also where the country's only municipal waste incinerator is operating, other parts of the country have lower population density, making transportation costs a more significant factor of waste management. The Budapest MSW incinerator has a capacity of 410 000 tonnes and approximately 52 % of the waste generated in Budapest is incinerated.

In spite of the differences observed in waste generation and the role of the single incinerator in the central region, there is no major difference in the recycling levels.

Material recycling is between 12-19 % all over the country given some differences in the achievements of the separate collection.

In addition, biological composting is almost negligible so far, only 0,5-3 % as illustrated in Figure 2.4 below.

**Figure 2.4 Regional differences in recycling of MSW**



Source: Eurostat regional data, 2012

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

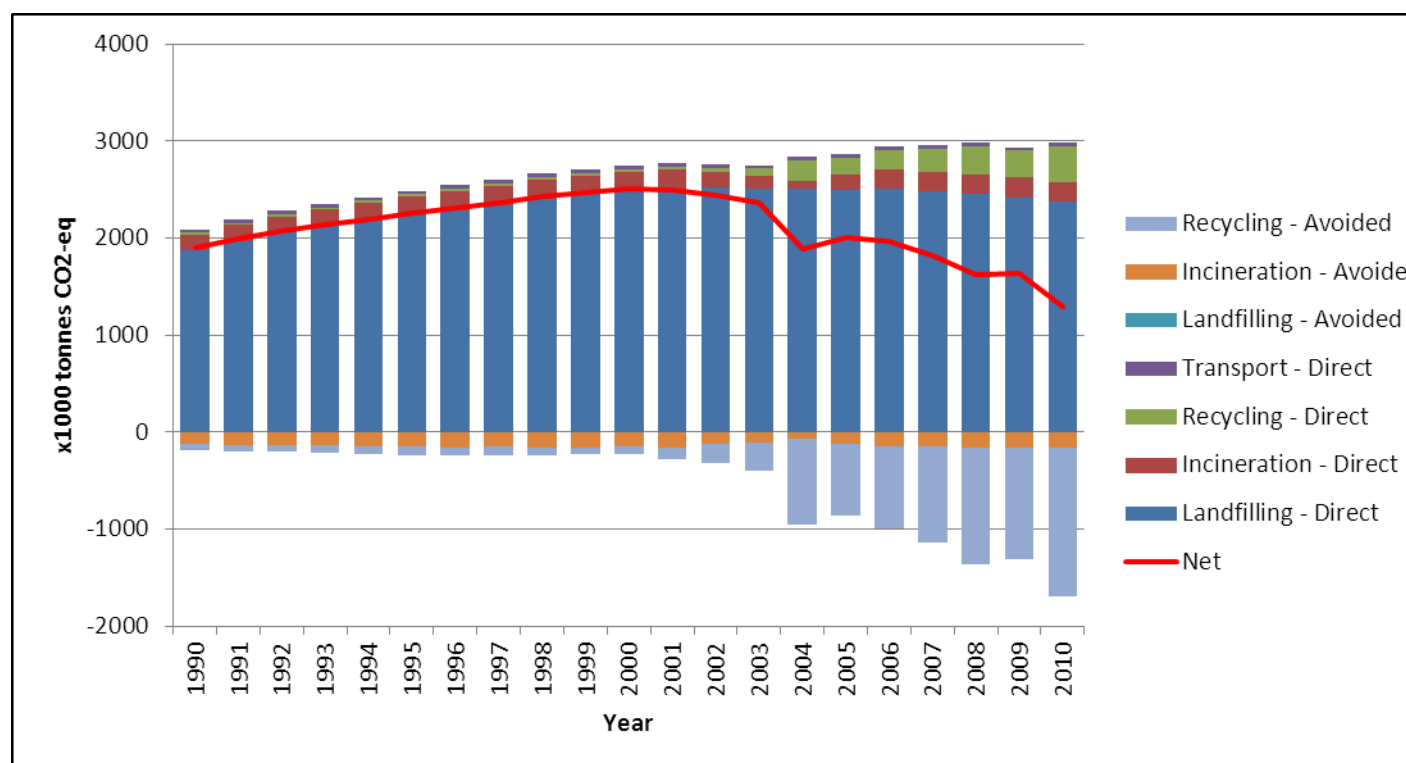
Although it has been discussed and considered several times over the last 10 years, the implementation of a landfill tax will not become a reality until 2013. According to the current plans as presented by the Environmental State Secretary of the Ministry of Rural Development in June 2012, the tax per tonne of MSW landfilled will be HUF 3 000 (EUR 10.5 on current exchange rates) from 2013 and will reach its intended level of HUF 12 000 (EUR 42) from 2016 (Source: National Waste Management Agency, [www.ohukft.hu](http://www.ohukft.hu)).

## 2.1.6 Environmental benefits of better MSW management

Figure 2.5 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.

All the GHG emissions (positive values) represent the direct operating emissions for each waste management option. These direct operating emissions have been calculated with the use of the IPCC methodology for landfills and incineration and life cycle modelling for the other technologies (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 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.

**Figure 2.7 GHG emissions from MSW management in Hungary**



Note: 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.

All processes generating electricity are assumed to replace the electricity mix of Hungary in 2009. Processes generating heat are assumed to replace the average heat mix for the EU-25 in 2002. The electricity mix and heat mix are assumed to remain constant throughout the whole time series. The composition of the MSW disposed in landfills, incinerated or recycled respectively are based on ETC/SCP (2011). In an Eionet consultation process, initiated by the EEA in 2012, Hungary updated the composition of the recycled MSW for 2010. The complete methodology is available from ETC/SCP (2011).

Figure 2.7 demonstrates that the direct emissions from waste management have gradually increased until 2006, peaking at 2.95 million tonnes, and from then on with the gradual diversion of waste from landfills due to extended incinerator capacity and improved material recycling the direct emissions stabilised around this level..

The levels of direct emissions from landfilling will continue to remain high for some years ahead because the BMW landfilled, for instance five years ago, will continue to emit considerable amounts of greenhouse gases.

However, the increased recycling of MSW results in more and more avoided greenhouse gas emissions because products based on virgin material generate more emissions than products which are based on recyclables. This positive impact can already be recognised in Figure 2.7 during the period from 2000 when the net emissions peaked at 2.514 million tonnes and have undergone a reducing trend, down to 1.292 million tonnes in 2010..

## **2.2 *Uncertainties in the reporting***

Uncertainties can arise from the way how countries report on MSW recycling. For example, some countries include packaging waste in MSW, others don't. There are also differences in the reporting of waste sent to MBT. These differences reduce the comparability of MSW data across countries.

Hungary started to build several MBT plants after 2000 in order to reduce the amount of combustible waste and MSW (residues) going to landfills, and by hoping the outputs from MBT will be used for co-incineration, for example, in existing power plants as also outlined in the relevant strategy documents on MSW treatment. However, in reality many MBT plants face a shortage in demand for the refuse-derived fuel (RDF) produced. It is unclear if the country reports the amount of waste sent to MBT as recycling.

**Figure 2.8 A comparison of packaging waste recycled and MSW recycled from 2001 to 2010**



Source: ETC/SCP, 2012 and Eurostat, 2012

Figure 2.8 shows the development in the reported amounts of MSW recycled and packaging waste recycled. The data seem to indicate that Hungary includes recycled packaging waste when reporting on MSW recycled.

### **2.3 Important initiatives taken to improve MSW management**

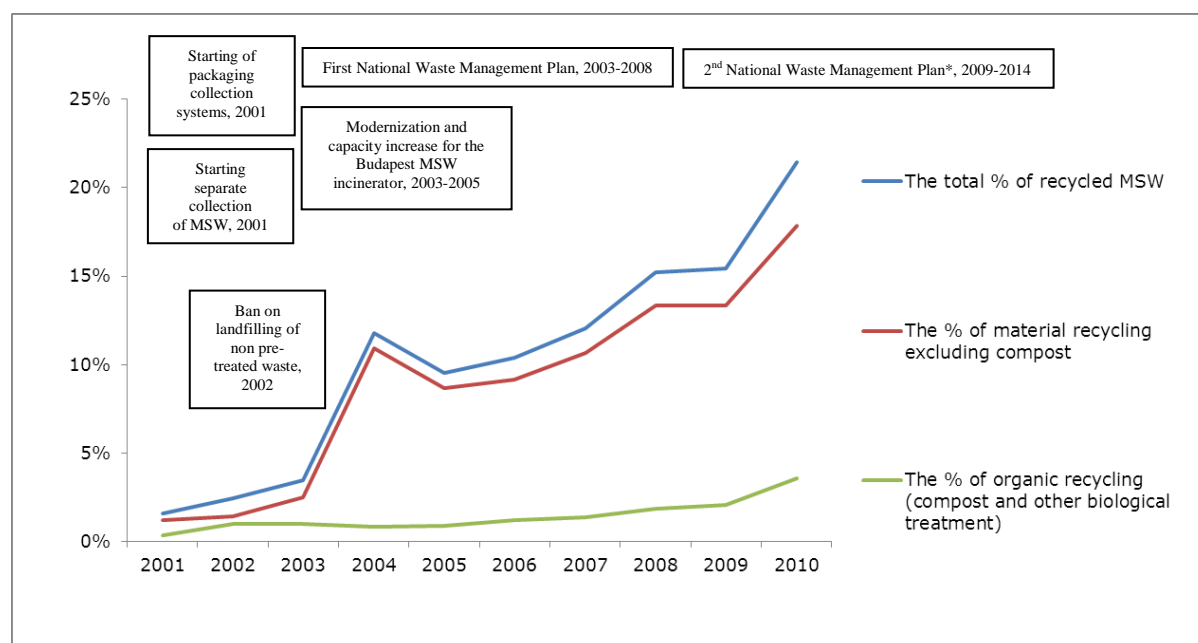
For decades, the dominant treatment of municipal waste in Hungary was landfilling. The MSW management policies in the late-1990s and after 2000 are due to the efforts made mainly in order to take up EU regulations and objectives in waste management, amongst others:

1. The national legislation provides the frame for the nationwide applied PAYT systems for municipal waste, but the organization and maintenance of the public service of municipal waste is the responsibility of the local authorities. There is no widespread practical implementation of PAYT, with the exception of certain municipalities.
2. Another key measure to divert municipal waste from landfills and to meet the targets of the Packaging Waste Directive was the introduction of separate waste collection systems throughout the country. A general campaign was launched in 2001 to gradually extend the network of ‘free of charge’ separate waste collection systems in public places. The purpose of the instrument is to dramatically increase the rate of recycling by making it easier and accessible for the population to recycle waste materials. The implementation of separate collection under the umbrella of extended producer responsibility schemes (i.e. Green Dot for packaging waste) resulted in the increased separate collection of PET plastics, paper, glass and aluminium waste. There are approx. 5 000 public separate collection facilities collecting a total amount of 485 000 tonnes. Approximately 57 % of the population had access to these facilities in 2010 and an additional 5-6 % had separate collection at their households.
3. The only municipal waste incinerator in the country was built in the late-1970s in Budapest. Modernisation of the facility was carried out between 2003 and 2005 in view of legal requirements and the technical standards set by the EU Waste Incineration Directive. During the period of its modernization (between December 2002 and December 2005) most of the municipal waste generated in Budapest was taken to landfills. Since then, this single

incinerator with energy recovery has been operating with an increased capacity of 420,000 tonnes per year. This is around 52 % of the municipal waste generated in Budapest.

4. A ban on landfilling of untreated waste was implemented in 2002. The purpose of this key direct legal measure is to achieve a proper ratio and composition of the waste landfilled, to be in compliance with the Landfill Directive and divert waste streams from landfills to incineration and recovery. In all types of landfill, it has been banned since 2003 to dispose of hazardous waste streams including waste tyres, shredded rubber and partially organic wastes (in line with the interim targets for BMW), which has also resulted in the development of MBT and composting capacities.
5. A National Biowaste Programme (2005-2008) to promote the diversion of BMW from landfills was launched in 2005. The order of priority is to reduce BMW by recycling (paper), composting, biogas generation, MBT and thermal utilization (KvVM, 2005). The programme was aimed at gradually extending the system to include garden waste, green waste from public parks, organic kitchen waste and paper by 2008.
6. Some programmes have been introduced in the field of waste management with a wide range of elements, including awareness raising, the presentation and promotion of new techniques and tools for preventing waste generation, as well as for the reuse of waste. In these programmes, civil organisations (NGOs) and the National Waste Management Agency are also involved.

**Figure 2.9 Recycling of MSW in Hungary and important policy initiatives**



Note: The 2nd National Waste Management plan 2009-2014 has not been officially adopted.

## 2.4 Future possible trends

The new draft National Waste Management Plan 2009-2014 was developed in conjunction with the upgrading of the new Waste Management Act, in line with the requirements of the revised 2008 Waste Framework Directive (EEA, 2010). The adoption of the law has been postponed many times, so there is no National Waste Management Plan in force at the moment in Hungary. However, already during the period of the first NWMP, a Strategy for the Management of Biodegradable Waste in

Municipal Solid Waste Management (2004-2016) and a Development Strategy for Municipal Solid Waste Management (2007-2016) were prepared in advance in order to serve as the basis of future developments for municipal waste and BMW.

The Parliament accepted the new act about waste on 8 October 2012, but it is still waiting for signature of the president of the Parliament. Accordingly, the new draft National Waste Management Plan 2009-2014 and 2015-2020 will be developed.

Material recovery is an approach widely accepted by the public, and the population seems to cooperate in terms of using the existing 'free of charge' public separate (packaging) waste collection facilities. The next aim is to better utilize this positive public attitude via separation at source which is planned to be implemented in most areas of the country. Accordingly, the 2<sup>nd</sup> NWMP will set the following objectives by following those in the National Environmental Programme 2009-2014:

1. The selective collection system of municipal waste should be accessible for 80 % of the population by 2014;
2. 60 % of the packaging waste should be recycled by 2012 (National Environmental Programme 2009-2014).

Next to the further development of separate collection, Hungary would like to introduce door-to-door collection and from 2014 a deposit refund system. By 2015 separate collection shall be set up for at least the following: paper, metal, plastic and glass. 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.

As required by the EU Waste Framework Directive, Hungary shall establish a National Waste Prevention Programme no later than 12 December 2013. It will function as separate programme. The programme will identify the waste prevention measures, and set out the waste prevention objectives. The aim of such objectives and measures shall be to break the link between economic growth and the environmental impacts associated with the generation of waste.

Although the interim targets of the Landfill Directive for 2006 and 2009 have been met by Hungary, the country may face some challenges in terms of meeting the 35 % reduction target by 2016 and to further improve (especially organic) recycling, as there seems to be a 'dead-lock' in the system hindering major improvements in the diversion of waste from landfills:

1. The market for compost from mixed MSW is poor. Partially due to strict technical standards on composts and the general public aversion to waste-derived composts, the market for recycled products including composts is very limited. Several landfill sites with composting installations are in operation, but they are struggling to find markets for their products. Capacity usage is very low at only around 50 %. Basically, the demand for compost is extremely low and only a fraction of the compost is sold on the private market.
2. Additionally, there is currently no national waste prevention programme that could further help the situation by reducing the amount of waste generated, although the draft NWMP aims at reducing the quantity of yearly waste production by 20 % over the period 2009 to 2013, to no more than 20 million tons by 2014.

Currently there is only one municipal waste incinerator with energy recovery. The new waste act requires that waste incineration or waste co-incineration shall be permitted if the incineration or co-incineration is directed to electrical and thermal energy production or cement, bricks, tiles and construction and ceramic manufacturing. In addition, only non-recyclable materials are allowed to be burned.



On 1 September 2011 a National Waste Management Agency (Országos Hulladékgazdálkodási Ügynökség, OHÜ) was established. This is going to be a single national coordinator, which mediates and organises the collection and recovery of waste. It takes part in organizing the selective collection system which is going to be financed from the changed environmental product charges (paid after certain products by the producer or the importer). The product charge has been used in Hungary with several revisions and changes since 1995. The OHÜ is responsible for preparing the National Collection and Utilization Plan.

It must be noted here, that in March 2012, Pro Europe, an organisation for European packaging and packaging waste recovery and recycling companies and schemes has requested the European Commission to launch an infringement procedure against Hungary over the legal changes, saying they are discriminative and likely to contravene the EU laws on waste management. Hungary answered the arisen questions and tried to prove that the new act is not discriminative. The process is still ongoing.

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