

Municipal waste management



Slovenia 

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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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Highlights

- Slovenia has significantly reduced its reliance on landfilling and improved landfill standards.
- The total reported recycling rate of municipal solid waste (MSW) has increased from 3 % in 2001 to 36 % in 2014 of generated MSW.
- Although Slovenia benefits from a derogation period until 2020, the EU target of reducing the total amount of biodegradable municipal waste (BMW) generated to 35% relative to 1995 was met in 2011, when the amount of landfilled BMW was 150 670 tonnes, 34 % of that generated in 1995.
- The Slovenian landfill tax was introduced in 2001 and revenues from it have been increasingly used to build up recycling infrastructure.
- Municipalities are responsible for MSW management in their administrative territories.
- The Operative Programme for Municipal Waste Management was adopted by the government in 2013.

1 Introduction

1.1 Objective

Based on historical municipal solid waste (MSW) data for Slovenia, 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 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 Slovenia's MSW management performance

In 2014, Slovenia generated 4.6 million tonnes of waste, of which 891 708 tonnes was municipal waste, or 432 kilograms per person (Eurostat, 2016a and Republic of Slovenia Statistical Officers, 2016).

In previous years, the majority of municipal waste was landfilled, but with changes to legislation, political instruments, the establishing of municipal waste management centres, and better separate collection and treatment of mixed municipal waste, the percentage of recycled municipal waste has started increasing, while that of landfilled MSW has steadily decreased since 2006.

The most relevant acts related to waste management in Slovenia are the Waste Management Programme and the Waste Prevention Programme (adopted in June 2016), the Environmental Protection Act (amended in 2004), the Decree on Waste Landfill (adopted in 2014 and replacing the previous Decree on the Landfilling of Waste) and the Decree on Waste (revised in 2011). Other relevant legislation may be grouped in several clusters: legislation concerning different waste types, legislation on waste management and legislation on monitoring emissions from waste treatment (EEA, 2010).

A National Waste Management Plan (NWMP), currently in draft, is expected to provide for considerable improvements in MSW management in the years to come.

2.1 Municipal solid waste indicators

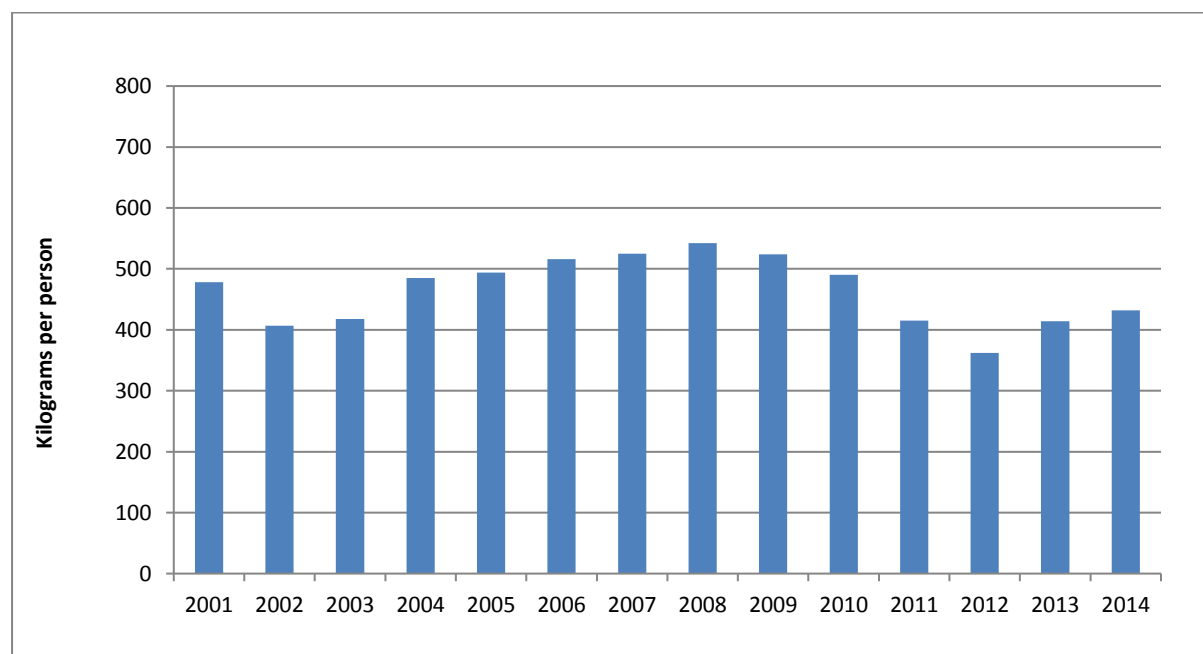
The following indicators illustrate the development of the Slovenian MSW generation and management in 2001–2014. All percentage figures have been calculated by relating the waste managed to the generated amount – rather than to the managed amount. Relating it to the total managed amount of MSW would generally result in higher rates for all waste management paths, as the amounts reported as treated are lower than the generated amounts in Slovenia.

Compared to the 2013 edition of this report, Eurostat data on MSW generation and management has been revised, and the most recent available data has been used in the present edition.

Figure 2.0 shows the development of MSW generation per person in Slovenia from 2001 to 2014. There has not been a significant overall change in MSW generation during the period, but from 2008

to 2012 waste amounts have steadily decreased, helped by the recent economic downturn, while in 2013 and 2014, MSW generated per person returned to about the 2011 level – (414 kilograms per person in 2013 and 432 kilograms in 2014). This is, nonetheless, lower than the EU average of 481 kilograms per person in 2013 and 474 kilograms in 2014.

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



Source: Eurostat, 2016a.

Note: break in series in 2002 and in 2004: in 2002 there was a change in data collection methods and harmonisation with EU methodology; from 2004, MSW generated refers not only to waste collected by public service systems, as it had until 2003, but also to waste collected by producer responsibility schemes covering special waste streams such as packaging and waste electrical and electronic equipment (WEEE).

In 2014, 65 % of generated MSW was separately collected (Republic of Slovenia – Statistical Officer, 2016). According to the Slovenian Environment Agency, the amount of municipal waste collected, including municipal waste collected outside the public service and excluding home composting, is projected to increase by 4 %, from 879 041 tonnes in 2011 to 916, 992 tonnes in 2020 (Slovenia, 2015).

In 2001, 75 % of the generated MSW, 712 000 tonnes, was disposed of in municipal landfills. Since 2006, the amount of MSW landfilled has decreased to 208 000 tonnes in 2014, 23 % of MSW generated in that year and below the EU average of 28 %. Total recycling has risen from 3 %, 26 000 tonnes, in 2001 to 36 %, 321 000 tonnes in 2014, with a peak of 42 %, 312 000 tonnes, in 2012 (Figure 2.1) (Eurostat, 2016a).

Landfilling of municipal waste – waste from households and other waste of similar origin and composition – falls within the competence of municipal public services and is permitted in non-hazardous waste landfills that are local public service facilities and/or public infrastructure facilities (SEA, 2010). Since June 2009, only treated waste may be landfilled and landfill site operators are obliged to provide financial guarantees to the local authority.

In 2010, there were 60 public landfills, of which 8 met the requirements of stringent waste landfilling legislation, 28 were being upgraded, and 24 were subject to closure (deactivation) procedures (OECD, 2012). The National Environmental Action Plan, NEAP 2, covering 2005–2012, envisaged

that only 13 municipal landfills would have been operational by the end of 2009, one in each statistical region. There are currently 14 municipal landfills in Slovenia operating with the required environmental permit (Slovenia 2015).

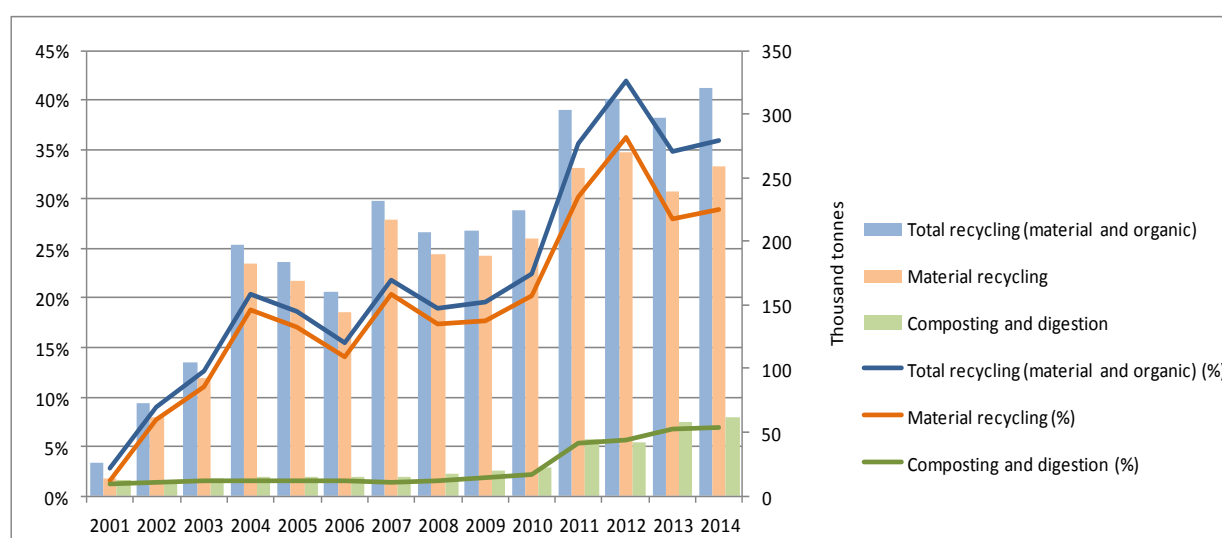
2.1.1 The recycling of municipal solid waste, 2001–2014

Figure 2.1 shows the development of recycling of MSW in Slovenia – total recycling, material recycling and composting and other biological treatment – based on Eurostat data (2016a). The recycling rates have changed considerably during the mentioned period. After 2001, recycling of MSW started to grow very rapidly until 2004. Following a drop in 2005 and 2006, recycling of MSW rose again, with a sharp increase in 2011 and 2012. The total percentage of recycled MSW, which was 3 % in 2001, peaked in 2012 at 42 % and decreased to 35 % in 2013 and 36 % in 2014. In absolute amounts, the increase was from 26 000 tonnes in 2001 to 312 000 tonnes in 2012, and 321 000 tonnes in 2014.

Efforts to reduce landfilling and improve MSW recycling have been supported by changes to legislation driven by accession to the EU, the introduction of taxes and financial guarantees for landfill operators, and the establishment of municipal waste management centres and of a system of eco-points for the collection of dry recyclables, such as paper, glass, and packaging (SEA, 2015).

In particular, based on the last available information, there are about 120 collection centres in operation, as well as 12 109 eco-points, one per 167 inhabitants, for the collection of dry recyclables (Gibbs *et al.*, 2014a; OECD, 2012). NEAP 2, however, envisaged collection centres in each local community and in every densely populated area with more than 8 000 inhabitants (OECD, 2012).

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



Source: Eurostat, 2016a.

The total increase of recycling is almost entirely linked to material recycling, which has increased from 1 %, 14 000 tonnes in absolute terms, in 2001 to 36 %, 270 000 tonnes, in 2012 and 29 %, 259 000 tonnes, in 2014.

In the same period organic recycling has seen a limited increase from 1 % in 2001 to 7 % in 2014. The amount of organic recycling is very low, so there is definitely room for considerable improvement.

It has to be noted that the system of data collection for material flows and waste is still under development and some classifications have been modified in recent years, making the assessment of waste management more complex. Changes in data collection and calculation methods concern, in particular, waste generation and waste recycling (Eurostat, 2015)¹.

The composition of the recycled MSW in Slovenia is shown in Table 2.1. The data is provided by the Slovenian Environment Agency (Slovenia, 2015). Paper and cardboard are responsible for 36 % of the recycled MSW in Slovenia. In addition, according to these data, garden waste and food waste were responsible for 28 % and 20 % respectively of the total recycled MSW.

Table 2.1 Slovenia, municipal waste fractions sent to recycling, 2013

Waste fraction	Quantity, 1'000 tonnes	%
Paper and cardboard	107	36
Plastics	7	2
Glass	13	4
Metals	2	1
Wood	15	5
Textiles	0	0
Food waste	58	20
Garden waste	84	28
Inerts (e.g., construction and demolition wastes)	6	2
WEEE	2	1
Batteries	0	0
Other hazardous waste	0	0
Others (e.g. bulky waste)	3	1
Total recycled	297	100

Source: Slovenia, 2015.

¹ With regard to waste generation, in 2002 there was a change in data collection methods and harmonisation with EU methodology; from 2004, MSW generated refers not only to waste collected by public service systems, as until 2003, but also to waste collected by producer responsibility schemes covering special wastes such as packaging and WEEE. With regard to waste recycling, from 2002 figures on municipal waste recycled exclude imports and include exports.

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 target². Slovenia has chosen calculation method 4 (Gibbs *et al.*, 2014a), which is the one used in this paper and the only method for which time series data exist. According to this methodology, the country has reported a recycling rate of 36 % in 2014.

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 (EC, 2015).

In order to meet the WFD recycling target, Slovenia has to increase its recycling rate by 14 percentage points by 2020, corresponding to 2.3 percentage points per year on average. This means that Slovenia seems to be on track to meet the target if it can maintain its efforts in increasing the recycling rate as in the period 2001–2014, when Slovenia achieved an average increase in total recycling of 2.6 percentage points per year.

2.1.2 Landfilling of biodegradable municipal waste

According to the EU Landfill Directive (1999/31/EC), Member States are to reduce the amount of biodegradable municipal waste (BMW) landfilled to 75 % of the total amount of BMW generated in 1995 by 2006; to 50 % by 2009; and to 35 % by 2016. Slovenia benefits from a derogation period for the 2016 target only, to be met by 2020, as the country in 1995 landfilled more than 80 % of the collected municipal waste³.

Targets are related to the generated amount of BMW in 1995. In that year Slovenia generated 445 000 tonnes of BMW. In 2006, the landfilled amount of BMW was 312 000 tonnes, or 70 % of the quantity generated in 1995 (Figure 2.2). Therefore, the target value for 2006 was successfully reached. In 2009, 232 000 tonnes of BMW were landfilled, 52 % of the quantity generated in 1995, which means that the target for 2009, 50 %, was not fully reached. The 2020 target of 35 %, was met in 2011, when the amount of landfilled BMW was 150 670 tonnes, 34 % of the quantity generated in 1995 (EC, 2014).

The figure indicates that Slovenia was able to halve the amount of BMW landfilled in the period 2006–2012.

At the national level, the 2010 Decree on Biodegradable Kitchen and Garden Waste Management required the door-to-door collection of such a waste. The Decree on the Landfilling of Waste (Official Gazette, No. 32/06, 98/07, 62/08, 53/09 and 61/11), later replaced by Decree on Waste Landfill (Official Gazette, No. 10/14 and 54/15), lays down more demanding targets than the EU ones, assuming that cohesion projects, for example, the construction of mechanical biological treatment

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:

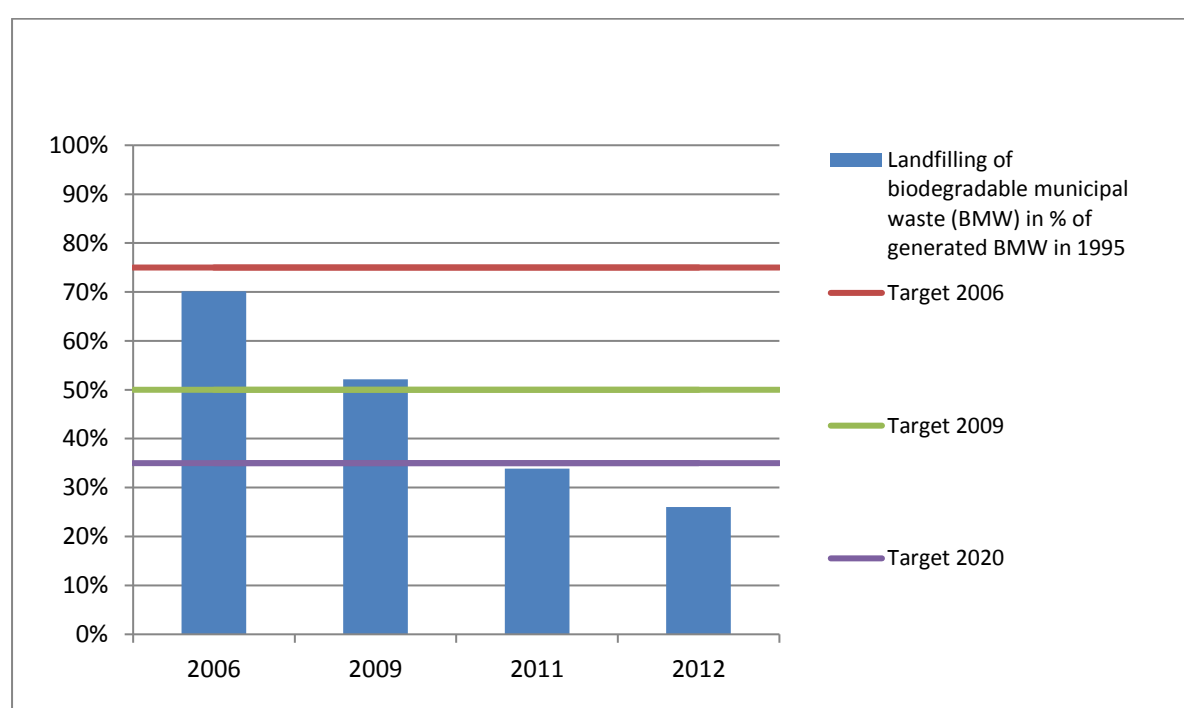
1. paper, metal, plastic and glass household waste;
2. paper, metal, plastic, glass household waste and other single types of household waste or of similar waste from other origins;
3. household waste;
4. municipal waste [the method used in this document].

³ In accordance with Article 5 of Directive 1999/31/EC.

(MBT) facilities, will be finalised. In particular, the targets for the reduction of BMW landfilled, relative to BMW generated in 1995, are 28 % in 2012, 25 % in 2016, and 22 % in 2019 (SEA, 2015). In 2012, 114 632 tonnes of BMW were landfilled, 26 % of the quantity generated in 1995, so the national target has also been met (Slovenia, 2015).

Another key element of the strategy to reduce landfill of BMW is the separate collection and treatment of kitchen and garden waste. NEAP 2 introduced a target of 100 % recovery and biological processing of kitchen and garden waste. A Decree on the management of biodegradable and organic kitchen waste, enacted in 2008, required local providers of municipal waste service to establish separate collections of organic kitchen waste by mid-2011, encourage home composting and ensure that collected organic kitchen waste is delivered to recovery facilities (OECD, 2012).

Figure 2.2 Slovenia, landfill of biodegradable municipal waste 2006–2012, % of biodegradable municipal waste generated in 1995



Source: EC, 2014 and Slovenia, 2015.

2.1.3 Regional differences in municipal solid waste recycling, 2008–2013

Slovenia has reported regional recycling data of MSW to Eurostat. Figure 2.3 shows regional differences in MSW recycling for the period 2008-2013, related to total recycling – the sum of material and organic recycling. Map. 2.1 shows regional differences in MSW total recycling in 2013.

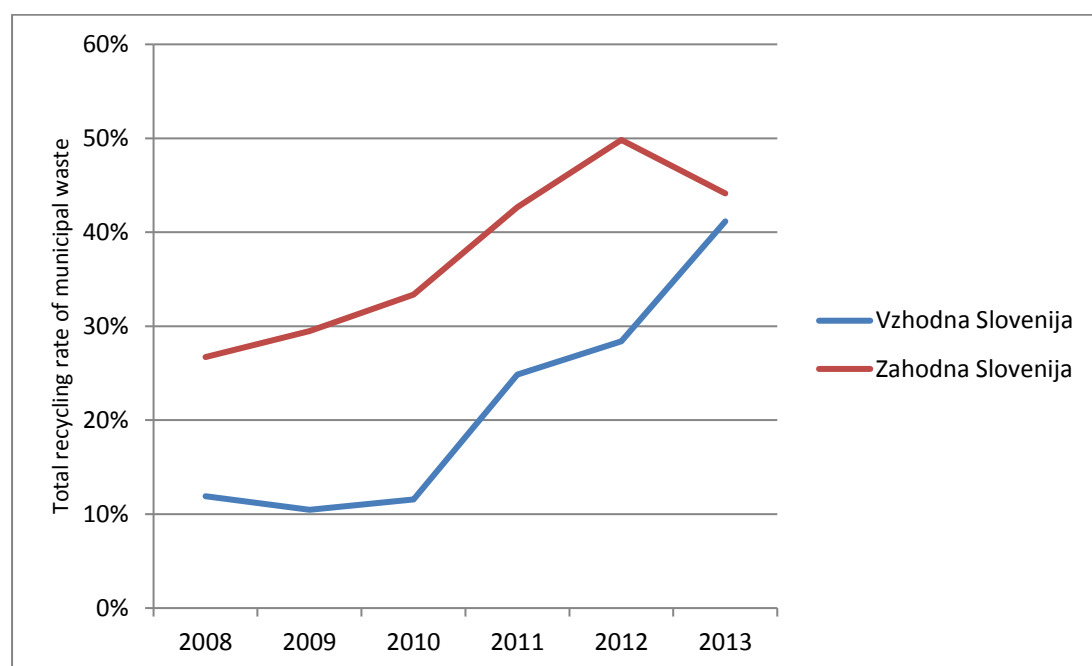
Slovenia has two regions: Vzhodna Slovenia, about 8,000 square kilometres, situated in the eastern part of the country and Zahodna Slovenia, about 12,000 square kilometres, covering the western part of Slovenia. The population of Vzhodna Slovenia and Zahodna Slovenia is respectively slightly above and slightly below 1 million (Eurostat, 2015b). In 2011, gross domestic product (GDP) per capita in Vzhodna Slovenia was 71 % of the EU average, while, in Zahodna Slovenia, it was 100 % of the average (Eurostat, 2015a).

No significant regional differences can be observed with regard to MSW generation: in 2013, 425 000 tonnes of MSW were generated in Vzhodna Slovenija and 428 000 tonnes in Zahodna Slovenija.

The two regions, in 2013, achieved 100 % MSW collection (Eurostat, 2016b).

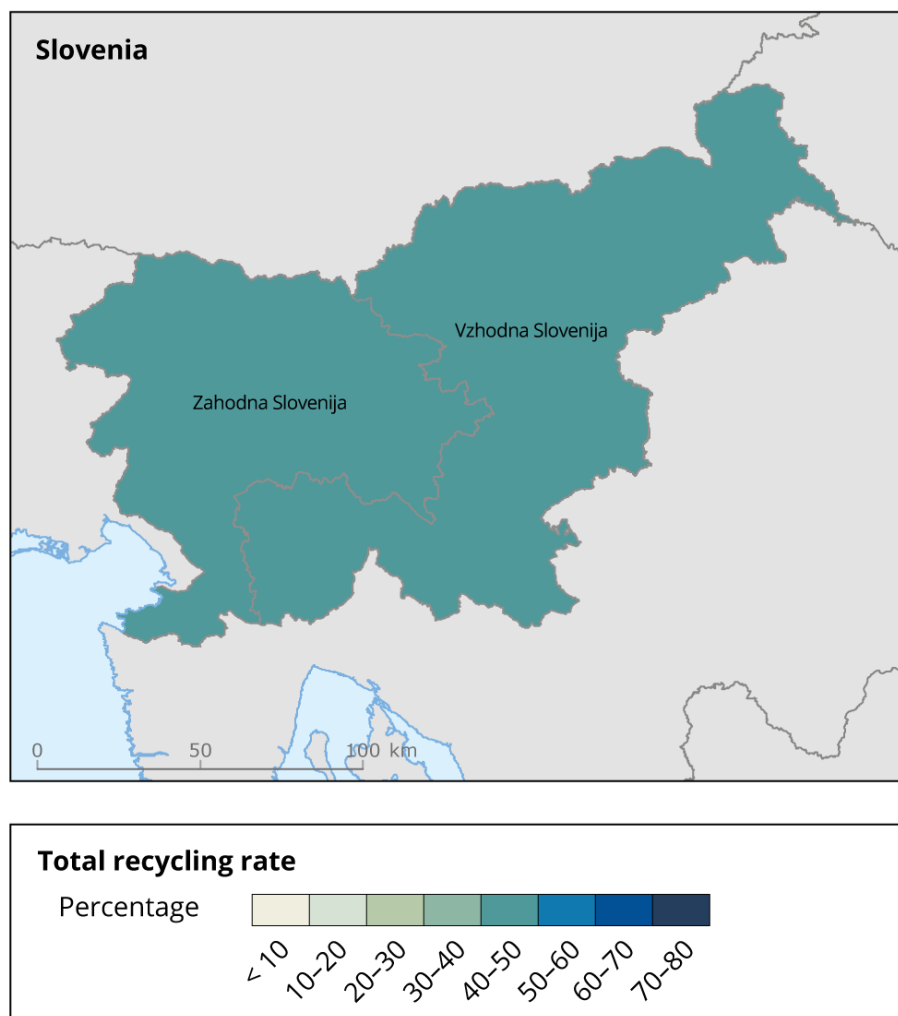
Figure 2.3 illustrates the regional differences in total recycling of MSW in 2008–2013 period. Such differences are linked to material recycling, as organic recycling is very low. Zahodna Slovenija shows a better performance than Vzhodna Slovenija, with a peak of 50 % in total recycling, reached in 2012. However, total MSW recycling rates of the two regions show a converging path.

Figure 2.3 Slovenia, regional differences in recycling of MSW, 2008–2013



Source: Eurostat regional data, 2015c.

Map 2.1 **Slovenia, regional differences in total recycling of municipal solid waste, Zahodna and Vzhodna, 2013**



Source: Eurostat regional data, 2015c.

With regard to the quality of regional data, according to Eurostat (2015d), from 2005 to 2012, the ratio between municipal waste generated and treated in the regions varies between 72 % and 93 %, while it drops to only 56 % in Zahodna in 2013. Moreover, regional data on waste treatment are not fully comparable with other countries because they do not follow the balance approach, which allocates the amounts of waste treated to the region where the waste was generated, but the impact of the waste transfer across regions on the comparability of data seems to be small.

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

The Slovenian landfill tax was introduced in 2001, when the Decree on the Waste Disposal Tax (Official Gazette, No. 70/01) was adopted. All landfill operators of landfills for hazardous, non-hazardous and inert waste are obliged to pay the tax for the disposal of waste (ETC/SCP, 2012).

According to the Organisation for Co-operation and Development (OECD) (2012), the landfill tax was an important factor in improving the operation and performance of landfills. However, this was mainly due to the reinvestment of revenues generated. The tax design appears to have had a limited

incentive effect on producers of waste in the production and service sectors and to have provided perverse incentives to municipalities to continue landfilling.

Some adjustments to the tax design and the use of the revenues, made in 2010, should have improved its overall effectiveness. Indeed, until 2010, the collected tax went into the state budget when municipalities did not approve relevant projects; after October 2010 the landfill tax revenue from municipal landfills went to municipalities and the revenue from industrial landfills to the state budget (ETC/SCP, 2012).

The rate of the landfill tax in 2001–2009 was EUR 19 per tonne. However, this was the maximum tax rate, while the average rate, calculated as the ratio of landfill tax collected from the operators of municipal waste landfills and the amount of municipal waste landfilled, has been around EUR 14.6 per tonne in 2002–2009. In 2010, the rate was raised to EUR 11 per tonne and the calculation methodology simplified (ETC/SCP, 2012).

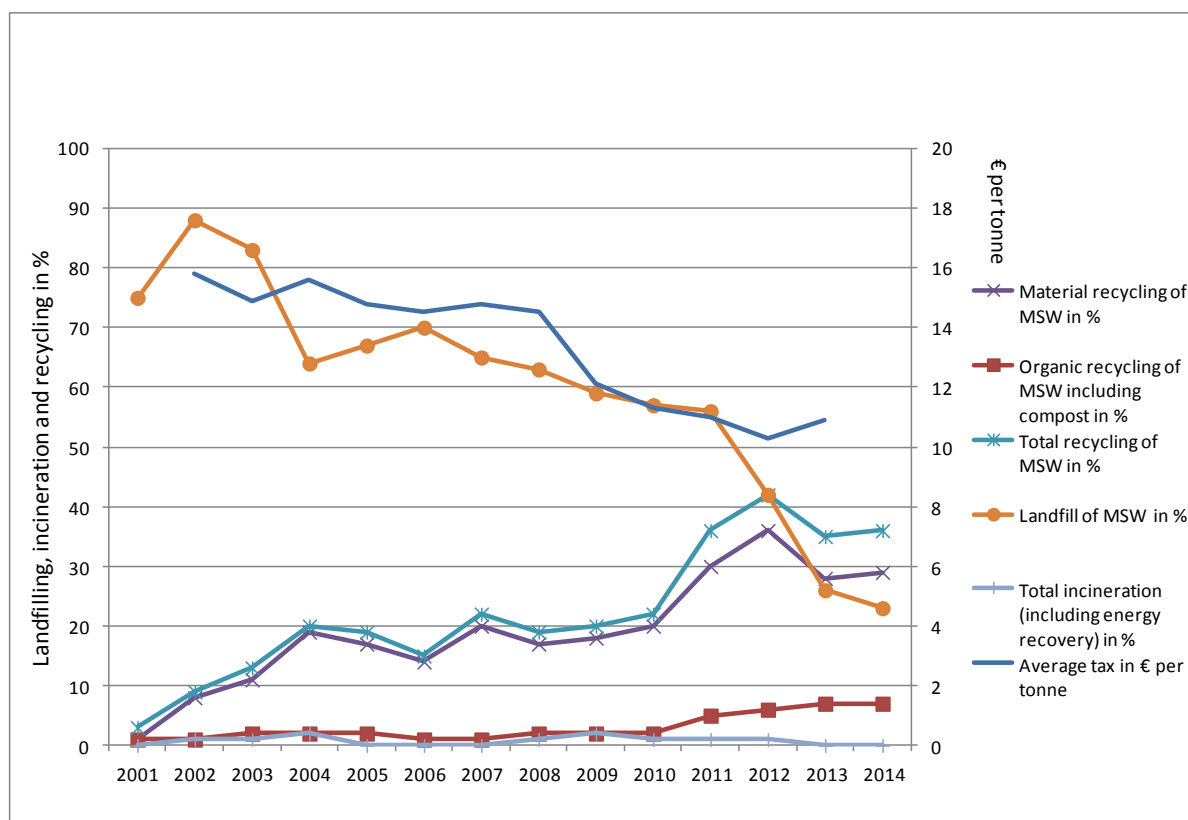
The landfill tax rate remained unchanged for 2011–2013, but it is expected to gradually increase in the coming years, based on the Operative Programme for Municipal Waste Management (Arcadis, 2014). According to Gibbs *et al.* (2014), the unit load on the environment, which is used to calculate the tax rate, will be increased from existing EUR 0.0022 to EUR 0.006 in 2014/15 and to EUR 0.008 in 2016. This equates to EUR 30 per tonne of non-hazardous waste disposed of in 2014/2015 and EUR 40 per tonne in 2016.

Figure 2.4 shows that the percentage of landfilled MSW has decreased steadily since 2006, and the landfill tax might have contributed to this, although the tax level is rather low compared to that of many other European countries.

Figure 2.4 also shows an increase of total recycling since the landfill tax was introduced in 2001. The increase, along with the decrease in landfilling, became significant after 2010, when the design of the landfill tax and the use of revenues were revised. The revenues from the landfill tax are mainly earmarked for investment in waste management centres. Since 2001, the investments in public infrastructure have increased. – from 2001 to 2004, the largest share was spent on landfills for municipal and hazardous waste, in order to bring them into compliance with the requirements of the EU Landfill Directive, but significant investment was also made in collection and recycling schemes (ETC/SCP, 2012). It has also to be stressed that the increase of total recycling of MSW is mostly due to material recycling and only to a lower extent to organic recycling.

The percentage of generated MSW waste incinerated was low and stable in 2001–2014, ranging from 0 % to 2 %, depending on the year.

Figure 2.4 Slovenia, development of landfilling, incineration, and recycling of MSW and the landfill tax, 2001–2016 and EUR per tonne



Source: Eurostat, 2016a; Slovenia, 2015.

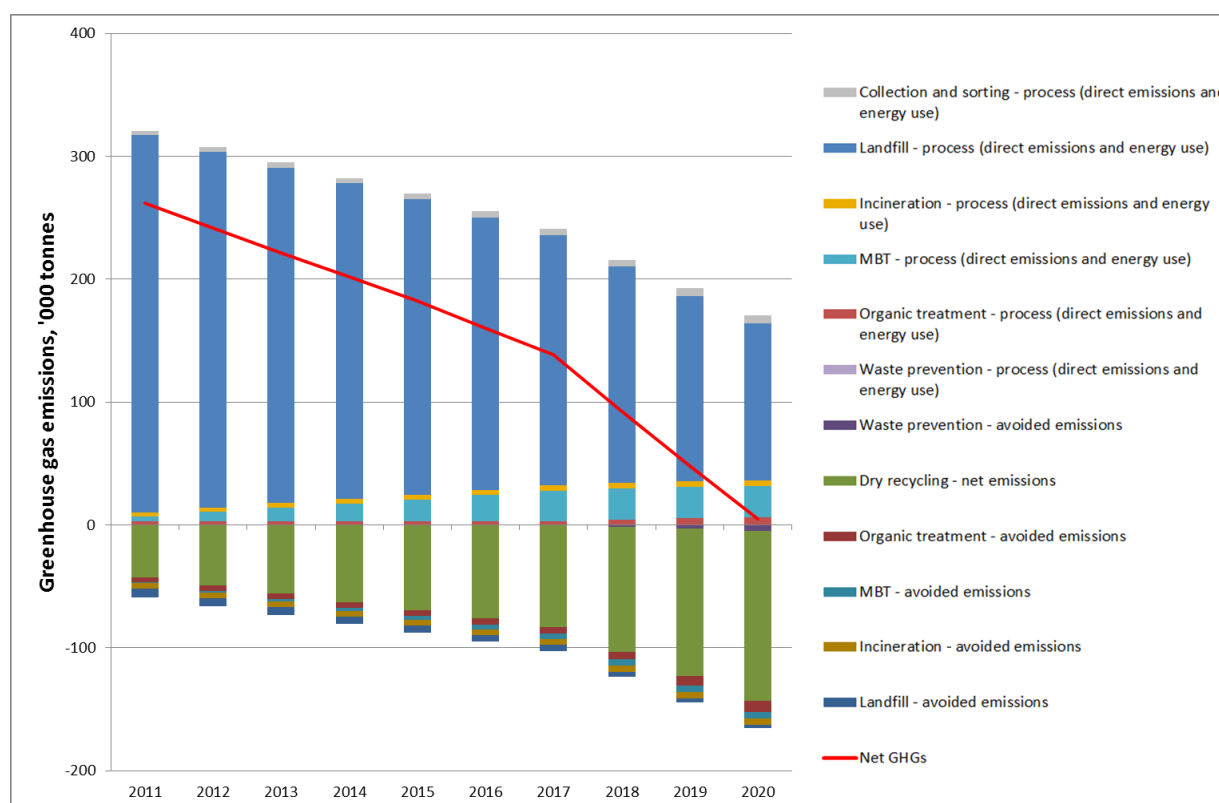
Note: the figure reports the average tax rate calculated as the ratio of landfill tax collected from the operators of municipal waste landfills and the amount of municipal waste landfilled.

2.1.5 Environmental benefits of better municipal solid waste management

Figure 2.5 shows a scenario for greenhouse gas emissions from MSW management in Slovenia that assumes a 0.42–0.7 % increase of generated amounts of municipal waste per year, and the full implementation of EU targets for municipal waste. 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 emissions depends on the amount of waste generated and the treatment it undergoes each year.

Figure 2.5 shows direct, avoided, and the net emissions resulting from the management of MSW. All the 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 landfill.

Figure 2.5 Slovenia, 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.

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

Based on the modelled scenario with full policy implementation, the net greenhouse gas emissions from the treatment of municipal waste in Slovenia are expected to decrease in 2011–2020 and reach values close to zero by 2020. The reduction would be mainly due to increased material recycling of dry recyclables which results in more and more avoided emissions. In the first modelled years of the scenario the direct emissions related to municipal waste management are estimated to originate almost exclusively from landfill, while the benefits of recycling are relatively low. Greenhouse gas emissions from landfills are caused by the breakdown of organic wastes accumulated over past decades. However, in the model that calculates landfill impacts over a 100-year period, the longer-term emissions from any given waste are attributed to the year in which that waste is deposited (Gibbs *et al.*, 2014b). Therefore, the positive effect of diverting BMW from landfills shows in the figures as an immediate reduction in emissions from landfill.

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.

It has to be remembered that the system of data collection of material flows and waste is still developing in Slovenia and some classifications and methodologies for calculations of reported data have changed in recent years.

In Slovenia, waste collected by producer responsibility schemes, including packaging, has only been covered by data on MSW generation since 2004 (Eurostat, 2015).

2.3 Important initiatives taken to improve municipal solid waste management

Two National Environmental Action Programmes have been adopted so far, which set out objectives for different environmental policy areas, including waste. NEAP 1, 2000–2005, established four objectives for waste management: to reduce waste generation and related risks at source; to increase material and energy utilisation of waste and reduce greenhouse gas emissions; to set up an effective waste management system; and to gradually eliminate old pollution sources. NEAP 2, 2005–2012, shifts the emphasis from thermal treatment to materials recycling and reuse. It introduces new reuse, recycling, and recovery targets for different waste streams, including MSW, to be achieved by 2012 (OECD, 2012).

With specific reference to MSW management, the Operative Programme for Municipal Waste Management was adopted by the government on 13 of March 2013 (Government Decision No. 35402-2/2013), pursuant to Article 28 of the EU's WFD (2008/98/EC). The Programme has been positively evaluated within the screening of *ex ante* conditionality regarding the consistency of national waste management plans with the requirements of the WFD – total score of 9/10, classification green (Arcadis, 2014). The operational programmes, adopted by municipalities, have to be in accordance with both NEAP 2 and national Operative Programme.

In interviews with representatives of the Slovenian Environment Agency, it has been highlighted that a NWMP is currently in draft and it is expected to provide for considerable improvements in MSW management in the years to come.

The most relevant legislative acts specifically related to MSW management are the following:

- the Environmental Protection Act, adopted in 1993 and significantly modified in 2004;
- the Decree on Waste, adopted in 2008 and revised in 2011, in order to transpose the EU WFD 2008/98/EC into national legislation;
- the Decree on Waste Landfill (Official Gazette, No. 10/14 and 54/15); adopted in 2014 and replacing the previous Decree on the Landfilling of Waste ;
- Decree on the Environmental Tax on Pollution from the Landfilling of Waste (Official Gazette, No. 14/14) amending Decree on the Waste Disposal Tax (Official Gazette, No. 70/01), and
- the Regulation on the Shipment of Waste, adopted in 2006.

Other relevant legislation may be grouped in several clusters: legislation concerning different waste types, legislation on waste management and legislation on monitoring emissions from waste treatment (EEA, 2010).

In Slovenia, municipal waste management is the responsibility of local communities – municipalities. The share of population covered by regular municipal waste collection increased from 76 % in 1995 to 96 % in 2010, even if national average of coverage masked significant variation at the municipal level, with the lowest level of coverage at 7 % (OECD, 2012). Since 2011, a 100 % coverage rate collection has been achieved (Slovenia, 2015).

Different collection systems are used: door-to-door schemes for packaging waste, kitchen waste, and mixed municipal (residual) waste; eco-points, bring system for glass, paper and plastic; collection centres, and the yellow bag scheme for packaging waste (Arcadis, 2014). According to the last available information, there are about 120 collection centres in operation, as well as 12 109 eco-points, one per 167 inhabitants, for the collection of dry recyclables (Gibbs *et al.*, 2014; OECD, 2012). NEAP 2, however, envisaged collection centres in each local community and in every densely populated area with more than 8 000 inhabitants (OECD, 2012).

Slovenia uses a volume-based pay-as-you-throw scheme: for door-to-door services, users are charged by container size and by collection frequency. Commercial producers use the same services as households, with their prices being similarly set by container size and frequency of emptying (Gibbs *et al.* 2014a).

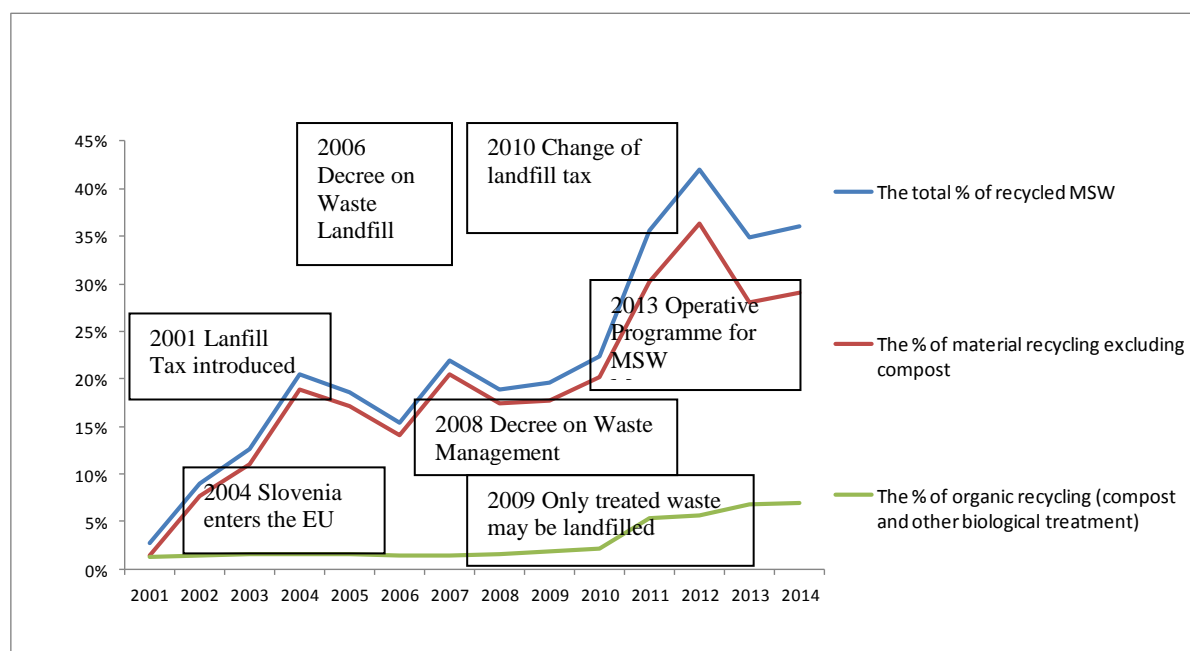
The types of treatment systems currently used in Slovenia are the following (Slovenia, 2016):

- Organic treatment includes composting and anaerobic treatment.
- A small plant for heat treatment of municipal waste is in operation.
- There are eight MBT plants operating in Slovenia, i.e. biostabilisation facilities with outputs to landfill and one facility with anaerobic digestion, providing self-sufficiency to the country for the treatment of mixed municipal waste destined for landfilling (Slovenia 2015).
- There are currently 14 municipal landfills in Slovenia operating with the required environmental permits.

At the legislative level, a Decree on the Management of Waste Electrical and Electronic Equipment, which had been in force since 2006, was replaced in 2015 by a new Decree. Rules on the management of packaging and packaging waste, which had been in force since 2000, were replaced in 2006 by the Decree on Packaging and Packaging Waste Handling, last amended in 2015. A Decree on the Management of Batteries and Accumulators and Waste Batteries and Accumulators was also adopted in 2008 (Slovenia, 2015; Bio Intelligence Service, 2012).

Many local communities have significantly improved their waste management performance. A remarkable example is that of Ljubljana. In ten years, the quantity of recovered materials in the Slovenian capital increased from 16 kilograms per person in 2004 to 145 kilograms in 2014. By 2014, the average resident produced just 283 kilograms of waste per year, 61 % of which was recycled or composted. This means that the amount of waste being sent to landfill decreased by 59 % in ten years, and total waste generation decreased by 15 %. A key ingredient for Ljubljana's success was the introduction of door-to-door collection, especially of biodegradable waste, which was the largest contribution to the sharp increase in recycling rates. At the same time, average monthly waste management costs for households fell to EUR 7.96 in 2014 (Oblak, 2014).

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



2.4 Future possible trends

In view of the amendments in the legislation, the establishment of regional waste management centres, taxes and financial guarantees provided for landfill operators, landfilled quantities of MSW have steadily decreased since 2006. As illustrated by Figure 2.2, the 2020 target related to the reduction of landfilled BMW had already been met by Slovenia in 2011.

Slovenia expects to further reduce greenhouse gas emissions from the waste sector – according to the IPCC methodology. This should be achieved primarily by reducing the quantities of biodegradable waste going to landfill, through more active separation of waste at source, heat treatment and the capture of landfill gas (EEA, 2010).

Slovenian environmental targets for waste management have been aligned with the EU ones. Besides the new targets introduced by Directive 2008/98/EC on Waste and the target of reducing the amount of biodegradable compounds in municipal waste landfilled, objectives were also set for collecting and/or recovery of individual waste streams. In its accession negotiations, Slovenia received derogation periods for achieving the packaging waste targets – by 2012 rather than by 2008, the WEEE collection and recovery, reuse, and recycling targets under Directive 2002/96/EC, as well as the WEEE collection targets under Directive 2012/19/EU. The 2008 EU WFD requires the establishment of a system for separate collection by 2015 for at least paper, metal, plastic and glass. Slovenia already has such a system in place, but separate collections can be further improved.

References

Arcadis, 2014, Screening of ex ante conditionality regarding the consistency of national Waste Management Plans, with the requirements of the Waste Framework Directive 2008/98 – Final Report.

Bio Intelligence Service, 2012, *Use of economic instruments and waste management performances*, Final Report. Annex I: Member State Factsheets.

EC, 2011. Commission Decision 2011/753/EU of 18 November 2011 establishing rules and calculation methods for verifying compliance with the targets set in Article 11(2) of Directive 2008/98/EC of the European Parliament and the Council. OJ L 310, 25.11.2011, p. 11–16.

EC, 2014: Member States' reporting to the Commission according to the Landfill Directive (1999/31/EC). E-mail from Bartosz Zambrzycki (the Commission) to Almut Reichel (the EEA) on 16 January 2014.

EC, 2015, Proposal for a Directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste; COM(2015)595 final.

EEA, 2010, *The European environment – state and outlook 2010*.
(http://www.eea.europa.eu/soer/countries/lv/soertopic_view?topic=waste), accessed 10 August 2016.

ETC/SCP, 2012, *Overview of the use of landfill taxes in Europe*. Fischer, C., Lehner, M. and McKinnon, D.L (eds.). ETC/SCP Working paper 1, 2012.
(http://scp.eionet.europa.eu/publications/WP2012_1) accessed 10 August 2016.

Eurostat, 2015, Country specific notes on municipal waste data, Last update December 2015 (http://ec.europa.eu/eurostat/cache/metadata/Annexes/env_wasmun_esms_an1.pdf) accessed 18 October 2016.

Eurostat, 2015a, Database by themes, General and regional statistics, Regional statistics, Regional economic accounts, *Regional gross domestic product, PPS per inhabitant in % of the EU-28 average by NUTS 2 regions* (<http://ec.europa.eu/eurostat/data/database>) accessed September 2015.

Eurostat, 2015b, Tables by themes, General and regional statistics, Regional statistics by NUTS classification, Population and area, *Population on 1 January by age, sex and NUTS 2 region* (<http://ec.europa.eu/eurostat/data/database>) accessed September 2015.

Eurostat, 2015c, Environment, Waste, Waste streams, *Municipal waste by NUTS 2 regions - pilot project (env_rwas_gen)* (<http://ec.europa.eu/eurostat/data/database>), accessed September 2015.

Eurostat, 2015d, *REQ 2014 – Data validation and clarification on waste statistics. Supply of statistical services in the field of water and regional environmental statistics Lot 2: Regional environmental statistics*, August 2015.

Eurostat, 2016a, *Environment, Waste, Waste streams, Municipal waste (env_wasmun)*.
(<http://ec.europa.eu/eurostat/data/database>) accessed June 2016.

Eurostat, 2016b, *Environment, Waste, Waste streams, Coverage rate of municipal waste collection by NUTS 2 regions - pilot project (env_rwas_cov)*
(<http://ec.europa.eu/eurostat/data/database>) accessed January 2016.

Gibbs, A., Elliott, T., Vergunst, T., Ballinger, A., Hogg, D., Gentil, E., Fischer, C., Bakas, I. and Ryberg, M., 2014a, *Development of a Modelling Tool on Waste Generation and Management*

Appendix 1: Baseline Report. Final Report for the European Commission DG Environment under Framework Contract No ENV.C.2/FRA/2011/0020.

Gibbs, A., Elliott, T., Ballinger, A., Hogg, D., Gentil, E., Fischer, C. and Bakas, I., 2014b, *Development of a Modelling Tool on Waste Generation and Management. Appendix 6: Environmental Modelling.* Final Report for the European Commission DG Environment under Framework Contract No ENV.C.2/FRA/2011/0020.

Gibbs, A., Elliott, T., Vergunst, T., Ballinger, A., Hogg, D., Gentil, E., Fischer, C. and Bakas, I., 2014c, *Development of a Modelling Tool on Waste Generation and Management. Headline Project Report.* Final Report for the European Commission DG Environment under Framework Contract No ENV.C.2/FRA/2011/0020.

Oblak E., 2014, The story of Ljubljana, *Zerowaste Europe*, Case Study N. 5.

OECD, 2012, *Environmental Performance Reviews: Slovenia 2012*. Organisation for Economic Co-operation and Development, Paris, France.

Republic of Slovenia, 2016, Statistical Officers, *Waste Statistics* (<http://www.stat.si/statweb/en/home>) accessed June 2016.

SEA, 2015, *European state of the environment 2010 – Contributions from Slovenia* (<http://www.arso.gov.si/en/soer/waste.html>) accessed July 2015.

Slovenia, 2015, Information received during the Eionet consultation of the paper. E-mail of 25 November 2015 from Barbara Bernard Vukadin, Slovenian Environment Agency.

Slovenia, 2016, Information received during the Eionet consultation of the paper. E-mail of 28 October 2016 from Irena Koželj, Ministry for Environment and Spatial Planning.