Zero Waste Europe

Residual Waste Capacity Assessment

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eunomia

Residual Waste Capacity Assessments - Introduction

Introduction

Zero Waste Europe is seeking to understand whether there is likely to be a 'gap' in the needs for residual waste infrastructure, once the circular economy targets have been met in 14 Member States.
The Member states of interest include:

- Bulgaria
- Croatia
- Cyprus
- Estonia
- Finland
- Greece
- Hungary
- Latvia
- Malta
- Poland
- Portugal
- Romania
- Slovakia
- Spain

For each of the countries a factsheet has been provided which gives:

1. an overview of historic municipal waste management performance;
2. the current and planned infrastructure for residual waste;
3. an estimate of the municipal residual waste arisings likely to occur in the future, factoring in the achievement of the 2035 Circular Economy Package (CEP) Targets; and
4. an estimate of the capacity gap with associated observations.

Approach to Modelling

Our approach to modelling is to first consider the level of current municipal waste arisings in a given Member State, alongside an estimate of the current level of residual waste treatment.

Current levels of municipal waste arising are based on data reported to Eurostat. We project the level of residual municipal waste requiring treatment through to 2035. This is based on growth in arisings based on the European waste model (factoring in economic and population growth alongside waste reduction factors) and meeting the CEP targets for recycling and reuse.

Current and future levels of residual waste treatment are based on our European facilities database which includes facilities dedicated to treating residual waste, (such as incineration, mechanical biological treatment (MBT), gasification and pyrolysis). Facility downtime is accounted for in the estimations.

For MBT facilities, we have adjusted the competitive capacity of MBT facilities to allow for 33% of weight reduction of input material due to moisture loss through the MBT process and material extracted for recycling, or identified as rejects. This is to reflect that MBTs produce a waste output (typically RDF) which requires final treatment or disposal.

We also present information on facilities that utilise a range of fuel sources including residual waste, such cement kilns processing Solid Recovered Fuel (SRF) and Refuse Derived Fuel (RDF), however these facilities are not included in future projections as the quantity of waste they can accept varies.

RDF Exports

For the purposes of this assessment we have not considered export of residual waste, as the aim of the exercise is to consider the forecast capacity gap within each of the Member States. It should be recognised, however, that increasingly residual waste is traded within Europe between Member States.

Data Uncertainties

The factsheets are based on municipal waste data reported by Member States to Eurostat. The primary source of data used in the modelling is derived from Member States' data returns submitted to Eurostat. In a recent study into the accuracy of European waste statistics, issues with many of the Eurostat datasets were identified, despite, in some cases, long time series. Two of the key causes were identified as:

1. insufficient verification of the data at EU and national level; and
2. lack of incentives for accurate data reporting.

Current recycling performance should therefore be viewed with some caution and we have provided an indication of the uncertainties surrounding the data for each member state factsheet.

Residual Waste Capacity Country Factsheet - Bulgaria

Headline Findings

Bulgaria has limited residual waste treatment infrastructure and its current recycling rate is 31.8%. Therefore, the country continues to landfill a large proportion of its municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Bulgaria results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Bulgaria alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. In Bulgaria the data on municipal waste is based on records from operators, and questionnaires completed by municipalities. An estimate is made based on observations of material handled by the informal sector.

Municipal Waste Management Performance

As shown in Figure 1, based on reported data, the amount of municipal waste sent to landfill has decreased from 3.0million tonnes (mt) in 2007 to 1.9mt in 2016. Across the same period recycling increased from 0.86mt to 0.92mt, equating to a 31.8% recycling rate in 2016.

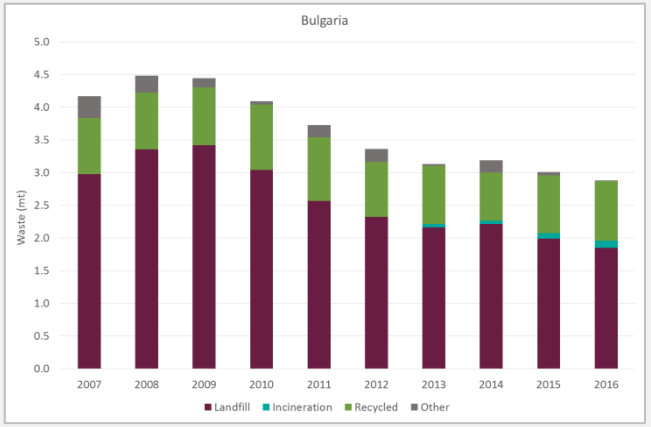

Figure 1: Municipal Waste Management in Bulgaria 2007-2016. Source: Eurostat

Current Residual Treatment

The first MBT plant in Bulgaria began pilot operations in 2009, and currently three MBT plants are operational in the country. The total effective capacity of these installations, which allows for the reduction in residual waste from MBT processes, was 0.17mt.

Additional co-incineration capacity is available for high-calorie fractions of MSW in cement plants.

	Facilities (number)	Operational Capacity (mt)
MBT	3	0.17
Cement Kiln	5	n/a

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 2.1mt in 2016 to 1.4mt in 2025 and 1.1mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here so not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to increase from 0.17mt to 0.21mt. The resulting impact on the residual treatment capacity gap is a reduction from 1.9mt to 0.9mt.

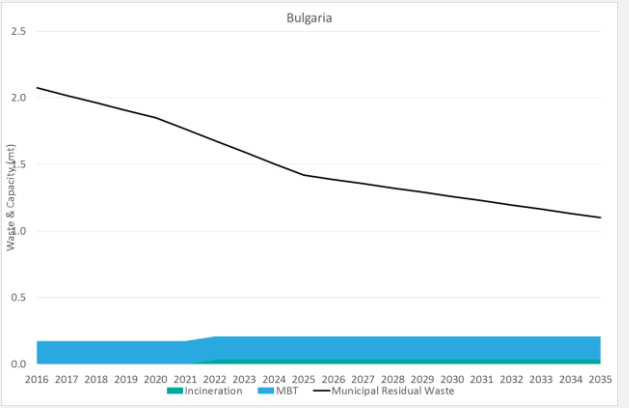

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Croatia

Headline Findings

Croatia has limited residual waste treatment infrastructure. The recycling of municipal waste has only started relatively recently, and in 2016 was reported to be 21%. Therefore, the country continues to landfill a large proportion of municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Croatia results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Croatia alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current performance should be viewed with some caution. In Croatia, municipal waste includes both household waste and similar waste from other sources, however there are inconsistencies in reporting from waste management companies. Recycled amounts are based on waste collected for recycling and does not take account of losses or rejects.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 1.6million tonnes (mt) in 2007 to 1.3mt in 2016. Across the same period recycling increased from 0.1mt to 0.4mt, equating to a 21.0% recycling rate in 2016.

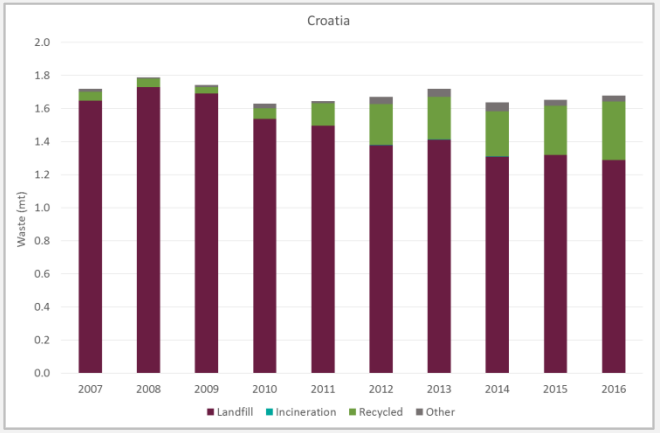

Figure 1: Municipal Waste Management in Croatia 2007-2016. Source: Eurostat

Current Residual Treatment

Croatia has 3 mechanical biological treatment (MBT) facilities. The total capacity of these installations was 0.06mt. Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.

	Facilities (number)	Operational Capacity (mt)
MBT	3	0.06
Cement Kiln	5	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 1.4mt in 2016 to 0.9mt in 2025. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates.

Across the same period residual waste treatment capacity is forecast to increase from 0.06mt of dedicated capacity in 2016 to 0.08mt in 2035. The resulting impact on the residual treatment capacity gap is a reduction from 1.3mt to 0.7mt.

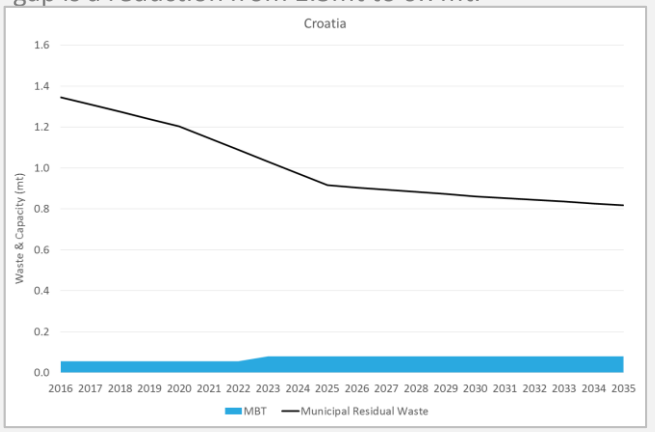

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Estonia

Headline Findings

Estonia has significantly increased residual treatment capacity in recent years, potentially resulting in an overcapacity in the light of the Circular Economy targets. The current recycling rate is only of 28.1% The significant increases in recycling and re-use rates required to meet the circular economy package targets in Estonia will results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Estonia alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. Estonia does not include the codes 15 01 (packaging) from the European List of Waste in its MSW reporting, and therefore recycling rates are systematically underestimated.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 0.4million tonnes (mt) in 2007 to 0.1mt in 2016. Across the same period recycling has remained about constant at 0.14mt, equating to a 28.1% recycling rate in 2016. Waste sent for incineration or recovery has increased from 2013 when incineration facilities were developed, from 0.21mt to 0.24mt in 2016.

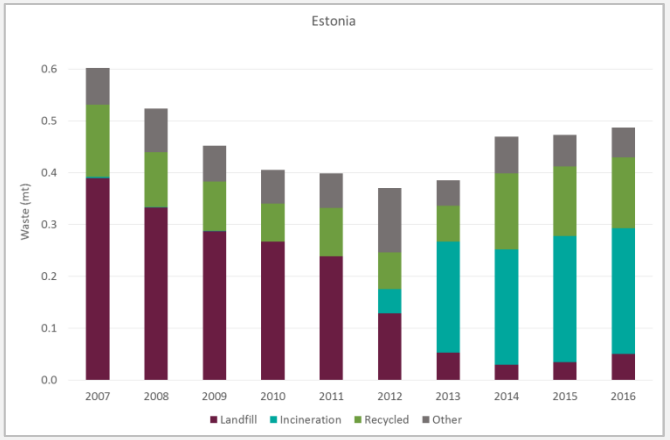

Figure 1: Municipal Waste Management in Estonia 2007-2016. Source: Eurostat

Current Residual Treatment

Estonia has 4 mechanical biological treatment (MBT) facilities. The total capacity of these installations was 0.08 mt. There is 1 incineration plant in operation in Estonia with an annual capacity of 0.23mt.

Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.

	Facilities (number)	Operational Capacity (mt)
Incineration	1	0.23
MBT	4	0.08
Cement Kiln	1	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 0.4mt in 2016 to 0.3mt in 2025 and 0.2mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation. Across the same period residual waste treatment capacity is forecast to remain at 0.3mt of dedicated capacity. The resulting impact on the residual treatment capacity gap is a shift from a gap of 0.04mt in 2016, to potential over-capacity of 0.08mt by 2035.

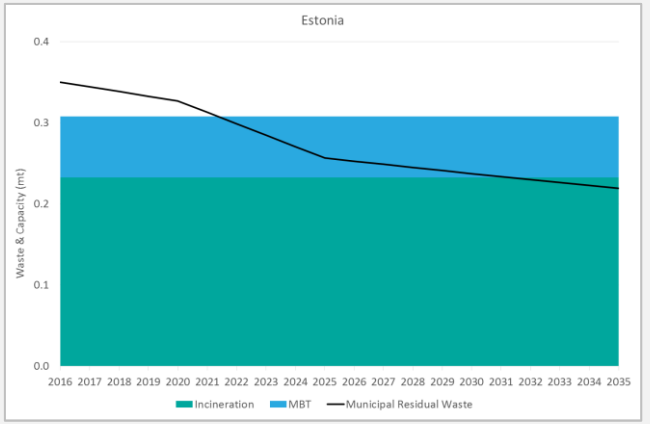

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Finland

Headline Findings

There has been a notable increase in incineration capacity in Finland since 2007, and more is under construction. This may result in an excess of residual waste treatment capacity in the light of the Circular Economy targets. The current recycling rate is 42%. The increases in recycling and re-use rates required to meet the circular economy package targets in Finland will result in a decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Finland alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. Finland includes a small amount of home composting and waste incinerated in households within municipal waste statistics. Packaging data is included for household, commercial, service and retail sectors.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 1.4million tonnes (mt) in 2007 to 0.1mt in 2016. Across the same period recycling has increased from 1.0mt to 1.2mt, equating to a 42.0% recycling rate in 2016. Waste sent for incineration or recovery has increased from 2013 from 1.1mt to 1.5mt.

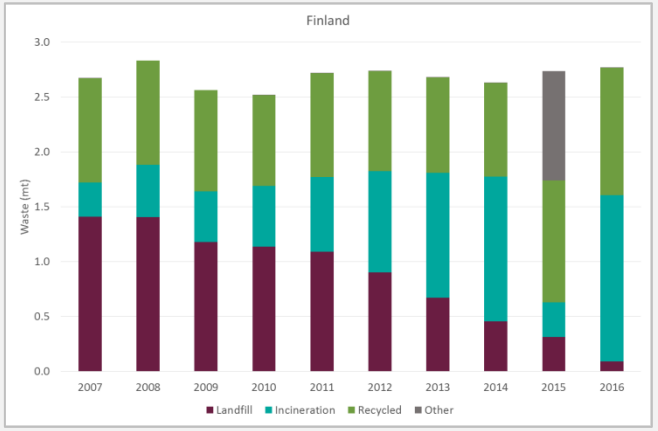

Figure 1: Municipal Waste Management in Finland 2007-2016. Source: Eurostat

Current Residual Treatment

Finland has 1 mechanical biological treatment (MBT) facility. The total effective capacity of these installations was 0.03mt. There are eight incineration plants in operation in Finland with an annual capacity of 1.7mt. There is one ACT facility providing an additional 0.19mt capacity. One incineration plant is under construction.

	Facilities (number)	Operational Capacity (mt)
Incineration	8	1.68
ACT	1	0.19
MBT	1	0.03
IED Biomass	2	0.02

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 1.6mt in 2016 to 1.4mt in 2025 and 1.2mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to increase from 1.2mt of dedicated capacity in 2016 to 2.0mt. The resulting impact on the residual treatment capacity gap is a shift from a gap of 0.43mt in 2016, to potential over-capacity of 0.86mt by 2035.

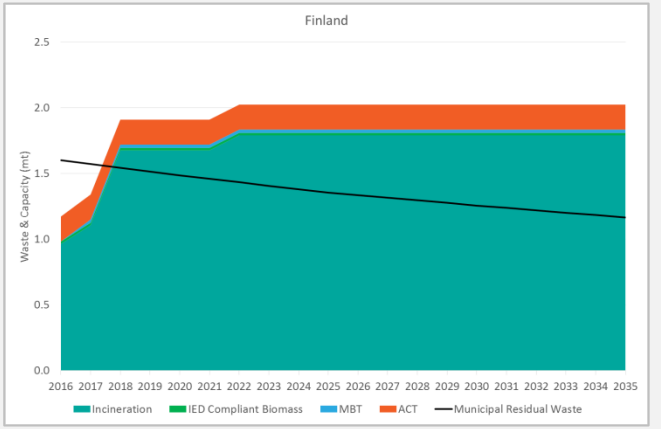

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Latvia

Headline Findings

Latvia has limited residual waste treatment infrastructure and its current recycling rate is only 25.2%. Therefore, the country continues to landfill a large proportion of its municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Latvia will result in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Latvia alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. Recycled packaging from municipal sources is not included resulting in an underestimation of recycling levels. Furthermore, significant amounts of materials are exported which are also excluded from reported data. Waste from commercial sources is not included.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 0.7million tonnes (mt) in 2007 to 0.5mt in 2016. Across the same period recycling has increased from 0.04mt to 0.2mt, equating to a 25.2% recycling rate in 2016. No waste sent for incineration or recovery has been recorded in Latvia since 2010.

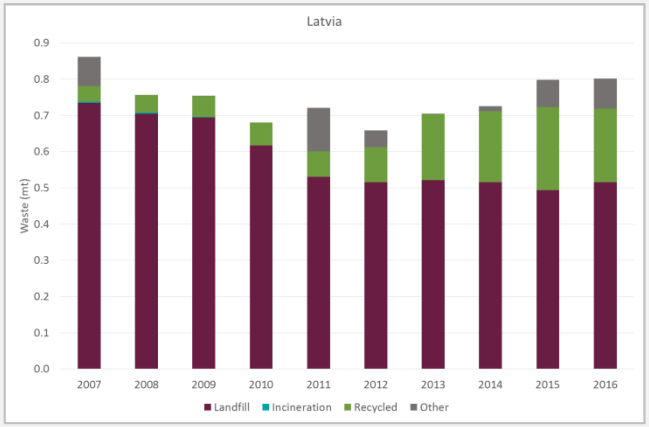

Figure 1: Municipal Waste Management in Latvia 2007-2016. Source: Eurostat

Current Residual Treatment

Latvia has 13 mechanical biological treatment (MBT) facilities. The total effective capacity of these installations was 0.18mt. Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.

	Facilities (number)	Operational Capacity (mt)
MBT	13	0.18
Cement Kiln	1	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 0.6mt in 2016 to 0.4mt in 2025 and 0.3mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to increase from 0.18mt of dedicated capacity in 2016 to 0.21mt in 2035. The resulting impact on the residual treatment capacity gap is a reduction from 0.42mt to 0.08mt.

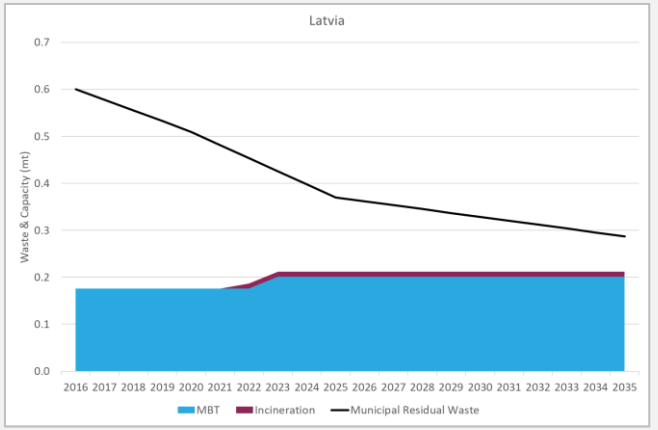

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Poland

Headline Findings

Poland has developed residual treatment infrastructure over recent years, and more is currently under construction. The current recycling rate is only of 34.7% The significant increases in recycling and re-use rates required to meet the circular economy package targets in Poland will results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Poland alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current performance should be viewed with some caution. In Poland data is based on written surveys. Waste not covered by municipal collection schemes is estimated, many waste facilities do not have accurate weighing equipment and packaging collected through producer responsibility schemes is not included. Furthermore waste managed in illegitimate sites is not included.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 9 million tonnes (mt) in 2007 to 5.3mt in 2016. Across the same period recycling has increased from 0.9mt to **3.8mt**, equating to a 34.7**%** recycling rate in 2016. Waste sent for incineration or recovery has increased from 2013 from 0.8mt to 2.3mt.

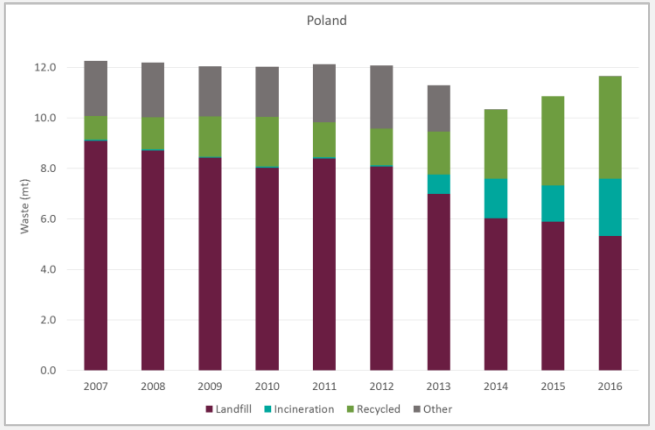

Figure 1: Municipal Waste Management in Poland 2007-2016. Source: Eurostat

Current Residual Treatment

Poland has **170** mechanical biological treatment (MBT) facilities. The total **permitted** capacity of these installations was **11.0mt**. There are **nine** incineration plants in operation in Poland with an annual capacity of 1.2mt. **A further 2 plants are in advanced stage of planning, and additional 40 are proposed.** Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.

	Facilities (number)	Operational Capacity (mt)
Incineration	9	1.2
MBT	170	2.8
Cement Kiln	10	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 7.2mt in 2016 to 5.3mt in 2025 and 4.3mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to increase from 2.9mt of dedicated capacity in 2016 to 4.5mt in 2035. Cement kilns provide additional capacity.

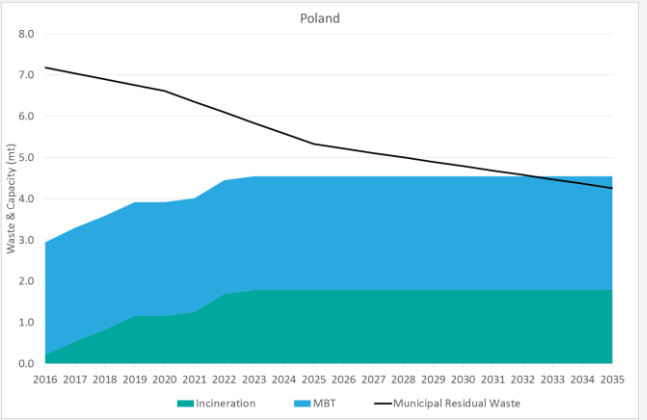

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Portugal

Headline Findings

Portugal has increased its residual waste capacity as well as its recycling rates, thus reducing the amount of municipal waste going to landfill. However, the country still presents a capacity gap. The current recycling rate is 30.9% The increases in recycling and re-use rates required to meet the circular economy package targets in Portugal results in a decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Portugal alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. Data on MSW in Portugal includes only that collected on behalf of or by municipalities and does not include waste from producers generating more than 1 100 litres of waste daily and that use private operators to treat their wastes.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 3.2million tonnes (mt) in 2007 to 2.2mt in 2016. Across the same period recycling has increased from 0.8mt to 1.5mt, equating to a 30.9% recycling rate in 2016. Waste sent for incineration or recovery in 2013 was 1.1mt.

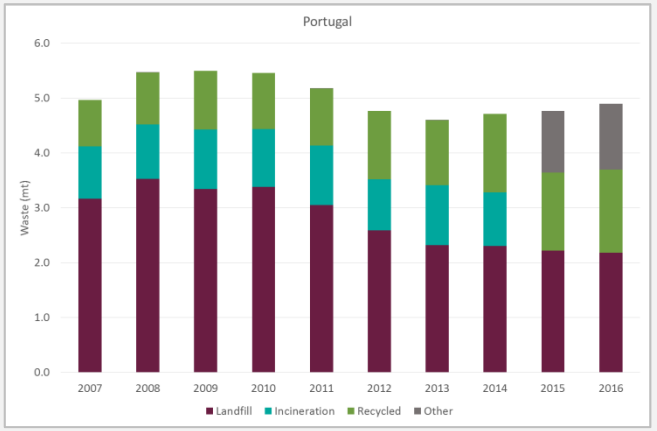

*Figure 1: Municipal Waste Management in Portugal 2007-2016. Source: Eurostat *Note that recovery/incineration has not yet been reported for 2015/2016.*

Current Residual Treatment

Portugal has **22** mechanical biological treatment (MBT) facilities. **The total permitted was 1.4mt, however,** the effective capacity of these installations **was 0.35mt**. There are four incineration plant in operation in Portugal with an annual capacity of **1.1mt**. Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.

	Facilities (number)	Operational Capacity (mt)
Incineration	4	1.1
MBT	22	0.35
Cement Kiln	5	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 3.4mt in 2016 to 2.5mt in 2025 and 2.1mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to remain at c.1.4mt of dedicated capacity. The resulting impact on the residual treatment capacity gap is a reduction from 2.0mt to 0.8mt.

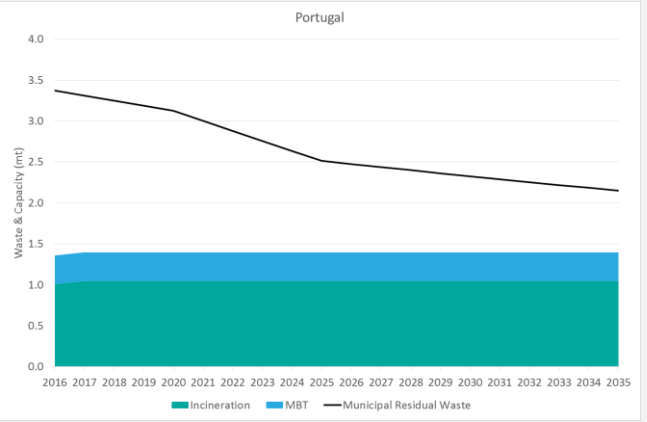

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Romania

Headline Findings

Romania has limited residual waste treatment infrastructure and its current recycling rate is only 13%. Therefore, the country continues to landfill a large proportion of its municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Romania will result-in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Romania alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. Romania's municipal waste data are collected by questionnaires. Waste generated by the population not connected to formal waste collection services is not included in the municipal waste reported to Eurostat. Data currently only includes packaging waste recycling reported by collectors engaged by local authorities.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 6.1 million tonnes (mt) in 2007 to 3.6mt in 2016. Across the same period recycling has increased from 0.03mt to 0.7mt, equating to a 13.0% recycling rate in 2016. Waste sent for incineration or recovery has increased from 2013 from 0.1mt to 0.20mt.

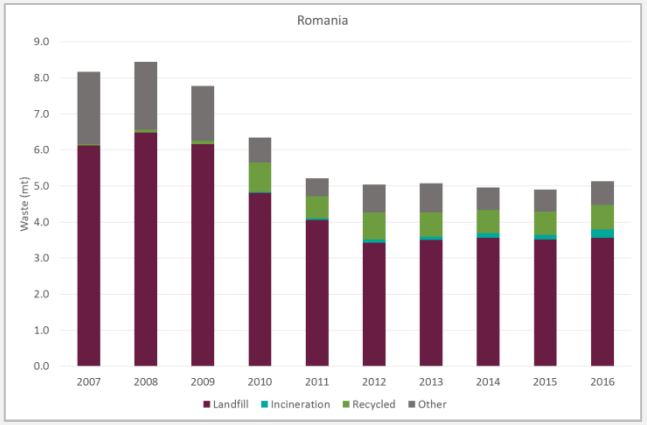

Figure 1: Municipal Waste Management in Romania 2007-2016. Source: Eurostat

Current Residual Treatment

Romania has two MBT plants in operation with an annual capacity of 0.03mt**. One incineration plant (with a capacity of 300,000t/year) has been approved for construction. Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.**

	Facilities (number)	Operational Capacity (mt)
MBT	2	0.03
Cement Kiln	7	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 4.3mt in 2016 to 2.6mt in 2025 and 2.0mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast **to** increase from 0.03mt of dedicated capacity in 2016 to 0.32mt in 2035. The resulting impact on the residual treatment capacity gap is a reduction from 4.3mt to 1.7mt.

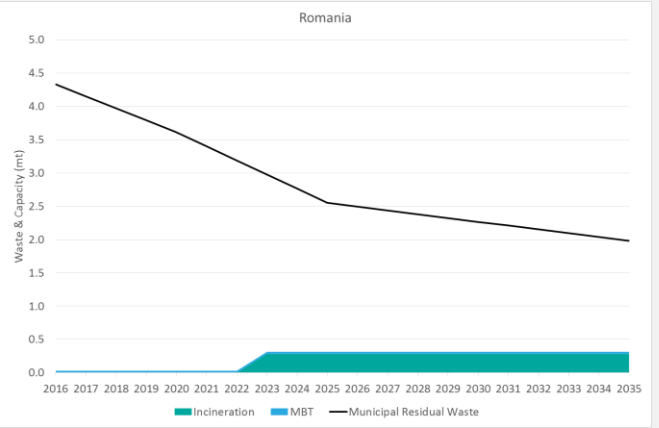

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Slovakia

Headline Findings

Slovakia has limited residual waste treatment infrastructure and its current recycling rate is only 23%. Therefore, the country continues to landfill a large proportion of its municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Slovakia results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Slovakia alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. In Slovakia recycling through producer responsibility schemes is not reported, packaging waste belonging to European List of Waste Category 15 is not reported as recycled MSW .

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has increased from 1.21 million tonnes (mt) in 2007 to 1.24mt in 2016. Across the same period recycling has increased from 0.1mt to 0.4mt, equating to a 23.0% recycling rate in 2016. Waste sent for incineration or recovery has increased from 0.17mt in 2013 to 0.20mt in 2016

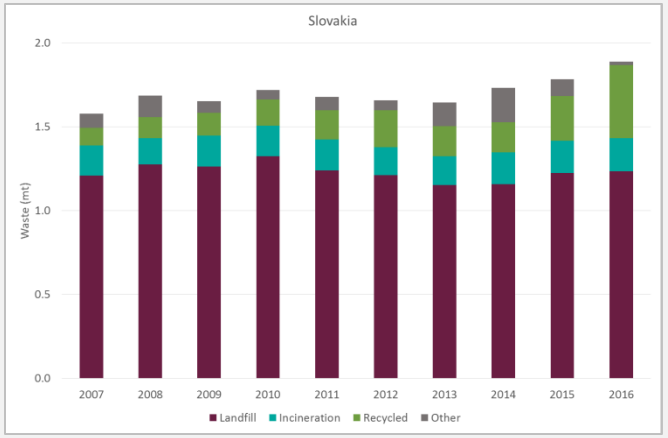

Figure 1: Municipal Waste Management in Slovakia 2007-2016. Source: Eurostat

Current Residual Treatment

Slovakia has **three** incineration plants in operation with an annual capacity of 0.3mt.

	Facilities (number)	Operational Capacity (mt)
Incineration	3	0.3

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 1.4mt in 2016 to 1.0mt in 2025 and 0.9mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to remain at 0.3mt of dedicated capacity in 2016 to 2035. The resulting impact on the residual treatment capacity gap is a reduction from 1.1mt to 0.6mt

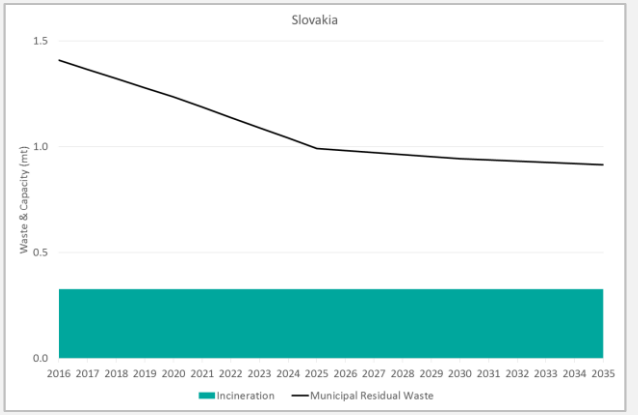

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Cyprus

Headline Findings

Cyprus has limited residual waste treatment infrastructure and its current recycling rate is only 17.2%. Therefore, the country continues to landfill most of its municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Cyprus results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Cyprus alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. In Cyprus the collection of data is carried out by a survey of municipalities. The data gathered is partly based on the weighing of waste trucks and partly on estimates.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 0.5million tonnes (mt) in 2007 to 0.4mt in 2016. Across the same period recycling increased from 0.03mt to 0.1mt, equating to a 17.2% recycling rate in 2016.

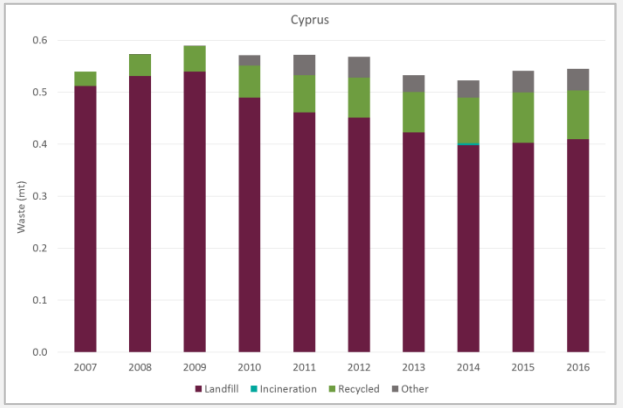

Figure 1: Municipal Waste Management in Cyprus 2007-2016. Source: Eurostat

Current Residual Treatment

Cyprus has 2 mechanical biological treatment (MBT) facilities. The total capacity of these installations was 0.04mt. **Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.**

	Facilities (number)	Operational Capacity (mt)
MBT	2	0.04
Cement Kiln	1	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 0.5mt in 2016 to 0.3mt in 2025 and 0.2mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to remain at 0.04mt of dedicated capacity. The resulting impact on the residual treatment capacity gap is a reduction from 0.46mt to 0.16mt.

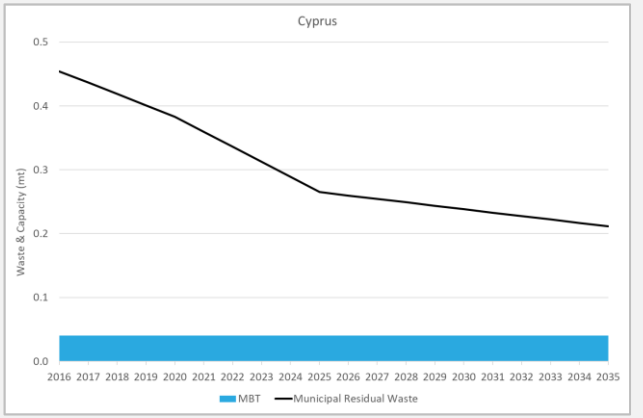

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Greece

Headline Findings

Greece has limited current residual treatment infrastructure and and its current recycling rate is only 17.2%. Therefore, the country continues to landfill most of its municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Greece results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Greece alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. In Greece, the data on municipal waste includes that collected through producer responsibility schemes. It is not clear however how municipal waste undergoing MBT is reported in Greece.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has increased from 4.0million tonnes (mt) in 2007 to 4.4mt in 2016. Across the same period recycling has decreased from 1.0mt to 0.9mt, equating to a 17.2% recycling rate in 2016. Waste sent for incineration or recovery decreased from 2013 from 0.029mt to 0.027mt.

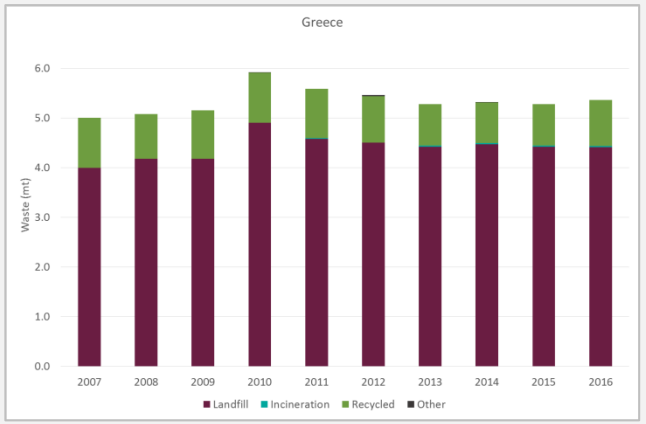

Figure 1: Municipal Waste Management in Greece 2007-2016. Source: Eurostat

Current Residual Treatment

Greece has 6 mechanical biological treatment (MBT) facilities. The total capacity of these installations was 0.16 mt.

	Facilities (number)	Operational Capacity (mt)
MBT	6	0.16

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 4.5mt in 2016 to 2.7mt in 2025 and 2.1mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period dedicated residual waste treatment capacity is forecast to increase from 0.13mt to 0.16mt. The resulting impact on the residual treatment capacity gap is a reduction from 4.3mt to 1.9mt.

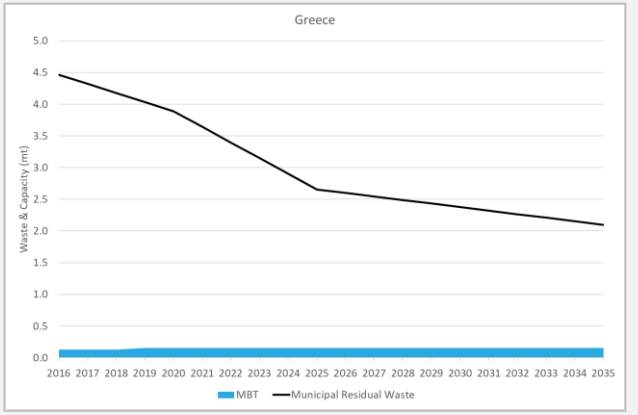

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Malta

Headline Findings

Malta has limited current residual treatment infrastructure, and its current recycling rate is only 7.1%. Therefore, the country continues to landfill most of its municipal waste. The current recycling rate is only 7.1%. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Malta results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Malta alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. Data for waste treatment in private facilities are included for the years from 2011 onwards. Discrepancies between MSW generated and treated relate to temporary storage of municipal waste.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 0.3million tonnes (mt) in 2007 to 0.2mt in 2016. Across the same period recycling has increased from 0.01mt to 0.02mt, equating to a 7.1% recycling rate in 2016. Waste sent for incineration or recovery remained at 1,000 tonnes from 2013 to 2016.

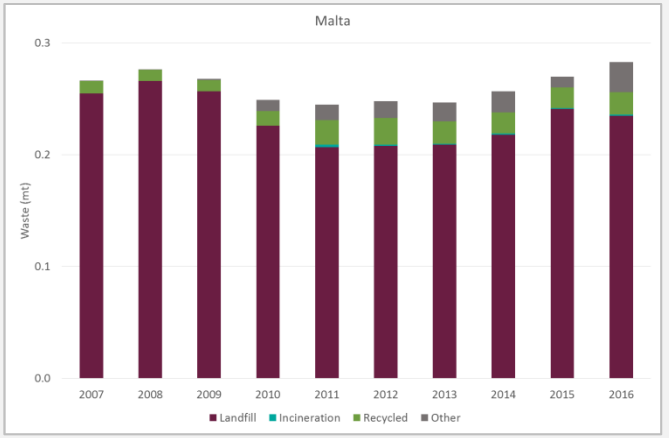

Figure 1: Municipal Waste Management in Malta 2007-2016. Source: Eurostat

Current Residual Treatment

Malta has 2 mechanical biological treatment (MBT) facilities. The total capacity of these installations was 0.03 mt. There is 1 incineration plant in operation in Malta with an annual capacity of 0.01mt.

	Facilities (number)	Operational Capacity (mt)
Incineration	1	0.01
MBT	2	0.03

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 0.25mt in 2016 to 0.13mt in 2025 and 0.11mt by 2035 if targets for recycling and re-use as set out in the Circular Economy Package are achieved. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to increase from 0.02mt of dedicated capacity in 2016 to 0.04mt in 2035. The resulting impact on the residual treatment capacity gap is a reduction from 0.23mt to 0.07mt.

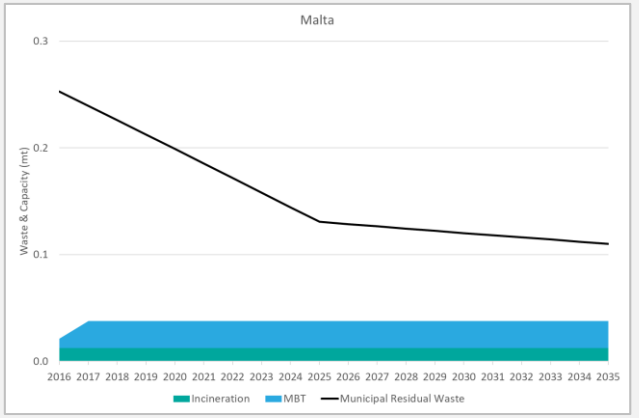

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet- Hungary

Headline Findings

Hungary has limited residual waste treatment infrastructure and its current recycling rate is 34.7%. Therefore, the country continues to landfill a large proportion of its municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Hungary will result in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Hungary alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. In Hungary data on municipal waste is submitted by individual site operators and undergoes a data verification process.

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 3.4million tonnes (mt) in 2007 to 1.9mt in 2016. Across the same period recycling has increased from 0.6mt to 1.3mt, equating to a 34.7% recycling rate in 2016. Waste sent for incineration or recovery has increased from 2013 from 0.3mt to 0.6mt.

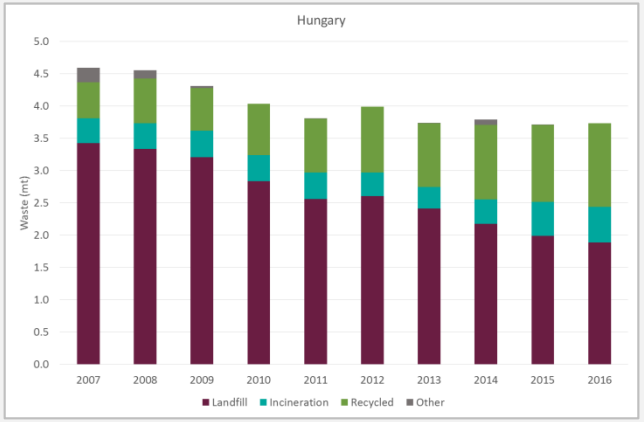

Figure 1: Municipal Waste Management in Hungary 2007-2016. Source: Eurostat

Current Residual Treatment

Hungary has 23 mechanical biological treatment (MBT) facilities. The total capacity of these installations was 0.30mt. There is one incineration plant in operation in Hungary with an annual capacity of 0.4mt. Co-incineration capacity is available for high-calorie fractions of MSW in cement plants.

	Facilities (number)	Operational Capacity (mt)
Incineration	1	0.39
MBT	23	0.30
Cement Kiln	3	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 2.5mt in 2016 to 1.8mt in 2025 and 1.5mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to remain at 0.7mt of dedicated capacity. The resulting impact on the residual treatment capacity gap is a reduction from 1.8mt to 0.8mt.

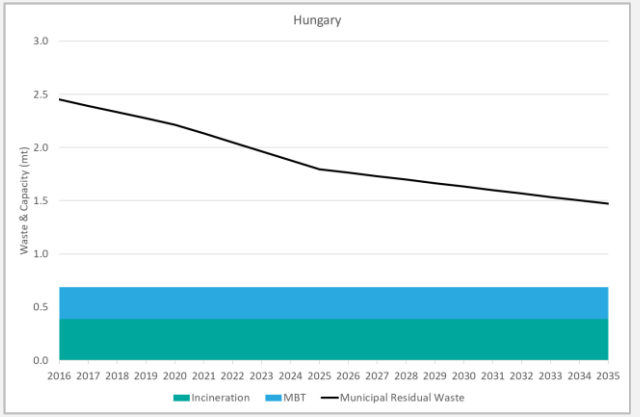

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Country Factsheet - Spain

Headline Findings

Spain has limited residual treatment infrastructure and its current recycling rate is 29.7%. Therefore, the country continues to landfill a large proportion of municipal waste. The significant increases in recycling and re-use rates required to meet the circular economy package targets in Spain results in a significant decline in residual waste requiring treatment.

Introduction

This factsheet provides a high level assessment of the residual waste infrastructure capacity in Spain alongside an estimate of the historic municipal residual waste arisings, and future projections, factoring in the achievement of the 2035 Circular Economy Targets. Comparing this to the current and planned infrastructure for treating residual waste provides an estimate of whether additional treatment capacity is required, and the quantity of additional capacity required for treating municipal residual waste.

Data Uncertainties

This factsheet is based on municipal waste data reported by Member States to Eurostat. A recent study into the accuracy of these statistics identified inaccuracies in reporting. As such, current recycling performance should be viewed with some caution. In Spain, there seem to be some erroneous reporting procedures for recycling that deviate from Eurostat's guidelines whereby organic MBT output sold as compost and water losses have been allocated to composting although water losses should be excluded

Municipal Waste Management Performance

As shown in Figure 1, the amount of municipal waste sent to landfill has decreased from 15.6 million tonnes (mt) in 2007 to 11.7mt in 2016. Across the same period recycling has increased from 8.0mt to 6.1mt, equating to a 29.7% recycling rate in 2016. Waste sent for incineration or recovery has increased from 2013 from 2.5mt to 2.8mt.

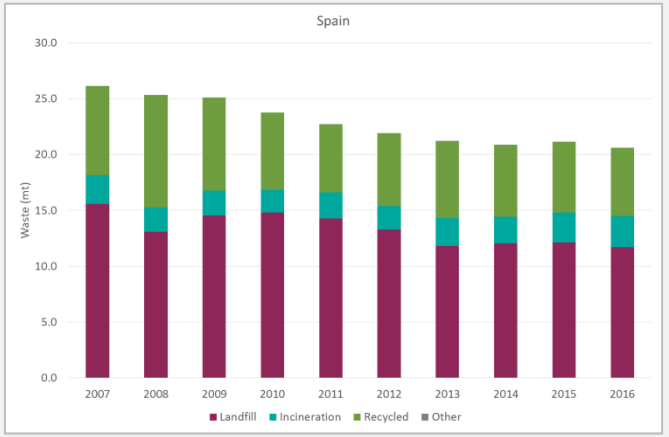

Figure 1: Municipal Waste Management in Spain 2007-2016. Source: Eurostat

Current Residual Treatment

Spain has 88 mechanical biological treatment (MBT) facilities. The total capacity of these installations was 2.5 mt. There are seven incineration plant in operation in Spain with an annual capacity of 1.9mt. Co-incineration capacity is available at cement kilns. In Spain there are 25 cement kilns authorised to accept waste. These cement kilns currently receive c. 0.8mt of waste.

	Facilities (number)	Operational Capacity (mt)
Incineration	7	1.9
MBT	88	2.5
Cement Kiln	25	-

Table 1: Current Treatment Facilities and Effective Operational Capacity.

Forecast Treatment Requirements

Based on waste arisings projections, alongside meeting recycling and reuse targets as set out in the CEP, municipal residual waste is forecast to reduce from 15.0mt in 2016 to 10.1mt in 2025 and 8.1mt by 2035. It should be noted that CEP target dates are subject to a 5 year derogation if agreed between the MS and Commission. As derogations have not yet been agreed the projections here do not allow for any derogation on target dates. Across the same period residual waste treatment capacity is forecast to remain at 4.4mt of dedicated capacity in 2016 to 2035. The resulting impact on the residual treatment capacity gap is a reduction from 10.6mt to 3.7mt.

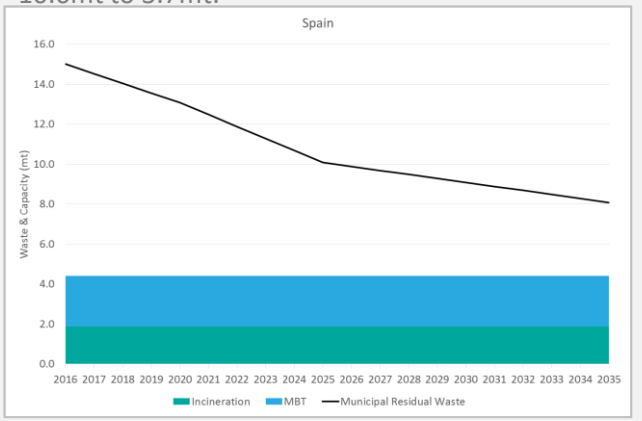

Figure 2: Municipal Residual Waste Capacity Gap Forecast 2016-2035

Residual Waste Capacity Assessments - Conclusions

Conclusions

The forecast presented in each country assessment provides an estimate of the quantity of residual waste arising to 2035, and the level of dedicated residual treatment capacity. The residual waste infrastructure requirements vary between countries. From the forecasts Poland, Finland and Estonia might show an overcapacity in dedicated residual treatment for municipal waste.

For those countries where residual waste treatment capacity is limited, it is important to note that the circular economy targets are not a goal, but rather a minimum standard required by the EU, and Member States can go beyond these targets to further reduce their amount of residual municipal waste. In some cases co-incineration capacity can be considered as an option.

As noted in the introduction for the purposes of each individual country assessment we have not considered export of residual waste, as the aim of the exercise was to consider the forecast capacity gap within each of the Member States. It should be recognised, however, that increasingly residual waste is traded within Europe between Member States. The largest importing nations are currently Germany, the Netherlands, Sweden, and Denmark. It is anticipated that as these countries strive to reach the CEP targets, increasing recycling and reuse, the level of residual waste arising nationally will decline, exacerbating the level of over-capacity in these countries. This provides the opportunity for countries with under-capacity to export to those with over-capacity.

The results of this analysis should be considered within the context of the Communication from the European Commission on The Role of Waste-to-Energy in the Circular Economy.[1]

The communication notes that "to support the transition towards a more circular economy, public financing of waste management, whether national or at EU level, should be consistent with the goal of shifting upwards in the implementation of the EU waste hierarchy.

The communication goes on to note that the transition towards a circular economy requires striking the right balance when it comes to waste-to-energy capacity for the treatment of non-recyclable waste. This is critical to avoid potential economic losses or the creation of infrastructural barriers to the achievement of higher recycling rates.

For countries with low incineration capacity and high reliance on landfill the communication indicates that member states should give priority to further development of separate collection schemes and recycling infrastructure. The increases required in recycling rates across the countries assessed here indicates that significant investment will be required in separate collection schemes and recycling infrastructure in order to reduce the residual waste capacity gap.

[1] *http://ec.europa.eu/environment/waste/waste-to-energy.pdf*

Finally, the communication recognises that the cross-border shipments of waste could help to make optimal use of the waste-to-energy capacity already available in a number of Member States.

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