

Ministerstvo životního prostředí

# **Waste Management Plan of the Czech Republic for the period 2015 - 2024**

**Ministry of the Environment**

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# 1. Introductory part

The strategy of the Czech Republic in the field of waste management for the next ten-year period is reflected in the document "Waste management plan of the Czech Republic for the period 2015 - 2024" (hereinafter "Waste management plan CR" or "POH CR<sup>1</sup>").

## 1.1 Scope and term of Waste management plan of the Czech Republic

- a) The Waste management plan of the Czech Republic establishes in accordance with the principles of sustainable development the objectives, policies, and measures of waste management in the Czech Republic.
- b) WMP CR refers to the management of all waste, with the exception of waste listed in § 2., paragraph 1, letters a) to i) of the Act no. 185/2001 Coll., on waste, amending certain other laws, as amended (the "Waste Act").
- c) WMP CR is the reference document for the development of Regional waste management plans. The binding part of WMP CR constitutes the mandatory basis for decision-making and other activities of the relevant administrative authorities, regions, and municipalities in area of waste management.
- d) WMP CR has been drawn up for the period of 10 years i.e. the period 2015-2024, and will be changed immediately following any fundamental change in the conditions under which it has been drawn up (e.g. new legislation on waste management, which will fundamentally affect the waste management strategy, including establishing of new objectives or redefinition of existing objectives, policies, and measures).

## 1.2 Structure and content, consultation process of WMP CR

### 1.2.1 Structure and content of WMP CR

The structure of WMP CR is primarily driven by § 41 and § 42 of the Waste Act and other related laws and regulations, including the implementing regulations, applicable EU directives, and methodological instructions of the European Commission to draw up the plan (*"Guidance Note for Waste management plan"*), which was issued in June 2012.

The WMP CR consists of the following main parts:

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<sup>1</sup> The Waste management plan also includes the Programme of Waste Prevention.

### **I. Introductory part**

The chapter provides basic information about the scope, structure, and content of WMP CR. It also provides basic characterization of the Czech Republic in terms of geography, demography, and economic situation. These characteristics define the basic framework for waste management in the Czech Republic.

### **II. Analytical part (Evaluation of the State of Waste Management)**

The chapter describes the current state and development of waste management in the Czech Republic in terms of waste generation and waste management. It provides an overview of technical and organizational solutions to waste management including the description of the network of facilities for waste management. A part of the chapter is the identification of problematic areas of waste management and defining the resulting waste management priorities.

### **III. Binding part**

It is a part of the Czech law and constitutes an Annex to the regulation which promulgates WMP CR (Government Regulation). It sets out the basic principles of waste management with emphasis on respecting the hierarchy of waste management methods. It establishes objectives, principles, and measures, especially for selected groups of waste, which are crucial for waste management in terms of their production or properties.

### **IV. Directive part**

The chapter provides an overview of the tools for achieving the identified objectives. It also deals with the managerial control of changes in waste management. It includes a set of indicators to be used in the continuous evaluation of waste management and in the fulfilment of objectives provided in the binding part of WMP CR.

## **1.2.2 WMP CR consultation process**

The drawn up document was repeatedly consulted and reviewed by the public and discussed with key representatives from the waste management sector (presentation and discussion of the draft WMP CR within the Waste Management Council<sup>2</sup> (hereinafter the "Council"), dealing with the comments of members of the Council, repeated intradepartmental review procedure, interdepartmental review procedure, settlement of comments from interdepartmental review procedure).

WMP CR is subject to the environmental impact assessment process pursuant to Act no. 100/2001 Coll., on environmental impact assessment, as amended (the so called SEA process).

The binding part of WMP CR will be released as a Czech Government Regulation.

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<sup>2</sup> An advisory body to the Minister of the environment.

## **1.3 Institutional organization of waste management**

### **1.3.1 The role of local governments, competences of state administration in waste management**

The local government competency in waste management is executed by the municipalities and regions.

**Municipalities** are the producers of municipal waste and have the direct responsibility for the physical management of waste on their territory. Each community creates a system of collection, removal and other waste management that is usually embedded in a municipal ordinance. In terms of financing the waste management system, it is a mandatory expenditure of municipal budgets.

**Municipalities with extended competency** ("MEC"), which are responsible for the performance of the state administration, respectively their offices, then exercise the powers conferred by the State in the area of waste management.

**Regional governments** are obliged by law to commission and approve in the form of an obligatory ordinance their management plans. The plans of regions must be based on and respect the Waste management plan of the Czech Republic.

**Regional administrations**, which are responsible for the performance of the state administration, exercise the powers conferred by the State in the area of waste management. They also provide methodological support for municipalities and municipal authorities, and comment on legislative standards proposed by the Ministry of Environment.

**Ministry of Environment** (hereinafter "MoE" or the "Ministry") is the central government administration authority in the field of waste management.

#### **1.3.1.1 Government administration and local governments of the Czech Republic in waste management, other institutions and bodies in waste management**

Public administration in waste management is generally determined by the effective Waste Act. The institutional organization of waste management model corresponds to the model and set up of public administration in the Czech Republic. In the same manner as the entire public administration, in terms of vertical organization, it is divided into state administration and local governments, including the specification of powers and responsibilities. In terms of horizontal organization, it is divided into individual institutions of public administration in the field of waste management, corresponding to their territorial jurisdiction and the associated hierarchy. The specific institutional framework for waste management is defined by the powers and competences of the individual institutions, which are largely defined in the Waste Act.

### **Ministry of Environment (MoE)**

MoE is the central government administration authority in the field of waste management. It executes supreme state supervision in waste management, prepares and proposes legislative standards in waste management; it is the producer of the Waste management plan of the Czech Republic and other strategic and policy documents on waste management binding for the whole country. It provides methodological activities for other public administration authorities in the area of waste management (at the level of regions and municipalities). It is the appellate authority against administrative decisions of the Czech Environmental Inspection and the regional authorities. It is the competent authority for transboundary transportation of waste. It prepares and maintains comprehensive records on the types of waste, its quantity and waste management methods, waste management facilities, registers by a formal decision the operators of collective systems and issues the decision on authorization of companies providing collective obligatory services in the area of packaging. It supervises the activities of collective schemes pursuant to the Waste Act and the authorized companies pursuant to the Packaging Act. It provides information on waste management in the Czech Republic. It provides information about the state of waste management in the Czech Republic to the relevant bodies of the European Commission and bodies of international conventions and protocols. It provides data on waste management to the authorities of the European Commission and other international institutions.

MoE CR has its own territorial authority also in the regions through its departments of state administration, that serve primarily as appellate authorities against the decision of the regional authorities in the first instance administrative proceedings.

### **The Ministry of Interior (Moi)**

Moi provides to the public administration authorities in the area of waste management reference data from the basic population register, data from the agenda information system of inhabitant registry and from the agenda information system on foreigners.

### **The Ministry of Agriculture (MoA)**

MoA coordinates the implementation of controls over compliance with obligations related to the use treated sludge on agricultural land.

### **The Ministry Health (MoH)**

MoH executes the supreme state supervision and controls the execution of state administration in the area of public health protection in waste management, authorizes legal entities or natural persons to evaluate the hazardous properties of waste, extends the validity of this authorization and revokes such authorization.

### **The Ministry of Finance (MoF)**

MoF provides cooperation in drafting legislation in the field of waste management and in the area of taxes and fees.



### **Regional governments and regional authorities**

The regional authorities (their territorial jurisdiction is determined by the boundaries of the regions, as higher self-governing entities) are the next level of bodies within the state administration in waste management. The regions, however, have in the area of waste management independent powers, primarily as the producers of Regional waste management plans. The Regional plans must be based on and respect the Waste management plan of the Czech Republic.

The regional authorities execute the state administration primarily in administrative proceedings, issue approvals to operate a waste management facility and check how legal persons, natural persons authorized to do business, and municipalities comply with the legislative provisions and decisions of the Ministry and other administrative authorities in the field of waste management. The regional authorities decide the appeals against the decisions of a municipal authority, and municipal authority with extended competency. In terms of restrictive measures, the regional authorities may e.g. prohibit the operation of facilities for waste management. The regional authorities have the power to repeal or amend the decision to grant consent, which falls within its competence pursuant to the Waste Act, in the event of a change in circumstances decisive for the issuance of the decision on consent, in the event when an operator of facilities for recovery, disposal, collection or purchase of waste is not able to comply with environmental protection conditions set out in the legislation, or in the event when a landfill operator has not created a financial reserve pursuant to the Waste Act and within the specified period has not remedied the condition, or when a legal entity or a natural person authorized to do business, to whom a consent has been given, repeatedly violate their obligations as stipulated by the Waste Act, or repeatedly fail to meet the conditions to which the consent is bound.

### **Municipalities and municipal authorities**

The public administration at the municipal level of waste management is defined by the obligations of municipalities pursuant to the applicable Waste Act. Pursuant to this Act, the municipalities are waste producers. Waste management in the role of waste producers is a self-governing competence of the cities and villages. In this context, each municipality or city creates on its territory a waste management system consisting of the gathering, collection, transportation (waste concentration), sorting, recovery, and disposal of waste.

Pursuant to § 44, paragraph 8 of the Act no. 185/2001 Coll., on waste, as amended, the municipalities may form a voluntary association of municipalities to comply with their obligations in the management of municipal waste. Pursuant to § 44 and § 50 paragraph 1, letter b) of the Act no. 128/2000 Coll., on municipalities, as amended, the municipalities may create associations of municipalities, as well as enter into associations of municipalities already created, and that for the purpose of ensuring the clean status of the community, public green area management, collection and removal of municipal waste and its safe processing, recovery or disposal. From the perspective of all size groups of municipalities and communities, the area of waste management is, with respect to self-governing competences of cities and municipalities, clearly the most important and largest area of environmental management. Waste management, particularly the waste management

system on the territory of the community (established by an ordinance under community jurisdiction as a lower level regulatory act), is the responsibility of the municipality and city bodies.

State administration in the area of waste management at the municipal level is executed mainly by municipalities with extended competency. The most important powers within their territorial jurisdiction include the granting of consents for hazardous waste management, consents to waive sorting or separate waste collection, keeping and processing of records on waste and methods of waste management, checking of compliance with legal provisions and decisions of central and other administrative authorities of waste management, in exceptional cases to impose an obligation to remove waste on the operators of waste disposal facilities, impose fines for breaches of obligations defined by the Waste Act or imposed by a decision based on the Act. They further express their opinion on the establishment of waste disposal facilities in zoning and construction permitting or e.g. on setting up of small facilities for biological waste treatment.

The municipal authorities of other communities (communities with an authorized municipal office and a municipal office) check whether legal persons and natural persons authorized to do business use the system established by the municipality for municipal waste management only on the basis of a written contract with the municipality, whether a natural person who is not an entrepreneur, disposes of waste only in accordance with the law. Furthermore they impose under the Act on Waste on legal entities and natural persons authorized to do business fines for the use of the waste management system of a municipality without a written contract with the municipality, at the same time they may establish measures and deadlines to remedy the situation by a separate decision. Furthermore, they impose fines on individuals for misdemeanours and they may also stipulate measures and deadlines to remedy the situation by a separate decision. The municipal authorities also check whether legal persons and natural persons authorized to do business have provided for the recovery or disposal of waste pursuant to the Waste Act.

### **Czech Environmental Inspection (CEI)**

CEI is a public administration authority organization in the field of waste management with jurisdiction over the entire country. It is represented on the various locations by the locally responsible regional inspectorates. According to the Waste Act, it is the supreme body of expert supervision and inspection of waste management, including the imposition of sanctions and verification of decisions issued by the ministry or other administration authorities. CEI executes monitoring and supervision in the field of waste management in various types of facilities for the re-use, removal, collection, and purchase of waste, checks the compliance with obligations to take-back products and management of electrical equipment and electrical waste, compliance with legislation in the field of waste packaging, chemicals, and biocides. Its role is to implement supervisory and oversight activities over waste producers. Either planned inspections are performed or unplanned spot checks are performed on the basis of complaints or notices, or identification of illegal waste management practices.

### **Central Institute for Supervising and Testing in Agriculture (CISTA)**

The Institute checks the compliance with the obligations when using treated sludge on agricultural land and imposes penalties for the breach of the obligations pursuant to the Act no. 156/1998 Coll., on fertilizers, soil conditioners, auxiliary plant preparations and substrates and on agrochemical testing of agricultural soil (the Fertilizers Act).

### **Public Health Protection Authorities**

These authorities are the administrative authority concerned in the decision-making in matters which affect the interests protected under the Act in the area of protection of human health. They evaluate and manage health risks, issue expert health opinions on the protection of people's health in waste management. They collaborate with other administrative authorities in the field of human health protection in waste management, comment on the operating policies of facilities for waste management.

### **Czech Trade Inspection Authority (CTIA)**

CTIA supervises obligations relating to the placing of batteries and accumulators on the market or into circulation, their labelling and provision of take-back services by the manufacturer and the last vendor.

### **Customs authorities**

Customs monitor the national and transboundary transportation of waste, import of batteries and accumulators from countries that are not EU Member States, pass initiatives to the Ministry to exercise the supreme state supervision, and may impose remedies for breach of duties relating to the shipments of waste.

During inspections, the customs authorities may stop vehicles, enforce immobilization of vehicles, check documents accompanying the waste and goods, check identity documents of the person transporting the waste, carry out physical inspection of goods and waste, collect and analyse samples and make photographic documentation.

In violation of a directly applicable regulation of the European Communities on shipments of waste, or pursuant to the Waste Act, the customs authorities may also conduct investigations on the location of waste producer, holder or notifier, and at the destination of the recipient.

Where illegal waste shipments or violations of an issued permit are suspected, the customs authorities have the competence to order the interruption of the transport and immobilize the vehicle at a designated place, and retain documents for the vehicle and cargo.

### **Police of the Czech Republic**

The police provide to the public authorities in the field of waste management reference data from the basic population register, data from the agenda information system of inhabitant registry and from the agenda information system of foreigners.

In the transboundary customs procedures and within 25 km border zone, it records, and where possible documents, suspicious events and circumstances indicating illegal transboundary shipments of waste into the Czech Republic. The identified suspect activities

are reported to the inspection and customs authorities and in collaboration and in cooperation with them the police provide professional assistance.

**Other bodies and institutions in waste management**

Other public administration authorities carry out state administration in waste management only indirectly, in relation to environmental protection.

**Other organizations**

There are a number of other specialist institutions that deal with the subject of waste management (e.g. CENIA, the Czech Environmental Information Agency, and others).

## **2 Evaluation of the current state of waste management in CR – Summary of analytical part**

### **2.1 Data sources**

The primary data source of waste management information is the comprehensive database Waste Management Information System (hereinafter "WMIS"), which collects primary data on waste production and methods of waste management in the Czech Republic, reported under the legal obligation to keep waste records. The WMIS database is managed for MoE by CENIA, Czech Environmental Information Agency (hereinafter "CENIA").

The main source of data for the development of WMP CR were the outputs from the WMIS database that collects required data for strategic waste management.

For the comprehensive analysis and evaluation of the state of waste management also data from other sources were used (e.g. the authorized packaging management company EKO-KOM, a.s., the Czech Hydrometeorological Institute, and others).

### **2.2 Basic summary of data on waste production and waste treatment**

#### **Waste production**

Nearly every human activity is associated with the production of waste. In many cases, it may be also the generation of waste, which is due to its composition and potential reactions hazardous to human health and the environment.

Development of the overall waste production in the Czech Republic in the period 2009 - 2012 is shown in Table no. 1.

Data has been used according to the valid methodology for the given year, from the document "Mathematical representation of calculation of the system of waste management indicators." Since 2009 the so called "Recalculated database" is used with the increased production of waste that includes the "below threshold producers" in the total waste production. The below threshold waste producers are the ones who did not exceed the reporting threshold set out in § 39 of the Waste Act, and therefore are not obliged to report waste production. Thus, the production figures have been corrected to include this unreported waste. Their waste is accounted for in the waste management reporting because the final waste management facilities have the obligation to report the waste at all times. The additional adjustments of production make the produced amount and waste amount managed to converge.

For the unambiguous identification of trends, the period 2009 – 2012 was selected for the evaluation.

Table 1: Production of waste in Czech Republic in the period 2009 - 2012 (thousand tons)

<b>Waste production</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Other waste	30106	30 027	28831	28 386
Hazardous waste	2 161	1 784	1 841	1 637
<b>Total production</b>	<b>32 267</b>	<b>31 811</b>	<b>30 672</b>	<b>30 023</b>

Source: Ministry of Environment, WMIS  
Recalculated database WMIS (2009-2012)

Note: Data in the evaluation have been used according to the valid methodology for the given year - "Mathematical representation of calculation of the system of waste management indicators." Since 2009 the so called "Recalculated database" is used with increased production of waste including the "below threshold producers" in total waste production.

The parameters of waste production in the Czech Republic are shown in Table. 2.

Table 2: Production of waste in the Czech Republic in the period 2009-2012

	Unit	All waste			
		2009	2010	2011	2012
<b>Total waste production</b>	1000 tons/year	<b>32 267</b>	<b>31 811</b>	<b>672 30</b>	<b>30023</b>
<b>Total waste production per GDP unit</b>	t/1000 PPS/year	0.16	0.15	0.14	0.14
<b>Production per inhabitant</b>	kg/inhabitant/year	3 076	3 025	2 922	2 857
		Hazardous			
<b>Total waste production</b>	1000 tons/ year	<b>2 161</b>	<b>1 784</b>	<b>1841</b>	<b>1637</b>
<b>Total waste production per GDP unit</b>	t/1000 PPS	0.010	0.009	0.009	0.008
<b>Share of total waste production</b>	%	6.7	5.6	6	5.5
<b>Production per inhabitant</b>	kg/inhabitant/year	206	170	175	156
		Other			
<b>Total waste production</b>	1000 tons/year	<b>30 106</b>	<b>30 027</b>	<b>28 831</b>	<b>28 386</b>
<b>Total waste production per GDP unit</b>	t/1000 PPS/year	0.15	0.142	0.136	0.133
<b>Share of total waste production</b>	production%	93.3	94.4	94	94.6

<b>Production per inhabitant</b>	kg/inhabitant/year	2870	2 855	2 747	2 701
		<b>Municipal</b>			
<b>Total waste production</b>	1000 tons/year	<b>5 324</b>	<b>5 362</b>	<b>5 388</b>	<b>5 193</b>
<b>Total waste production per GDP unit</b>	t/ 1000 PPS/year	0.03	0.026	0.025	0.024
<b>Share of total waste production</b>	%	16.5	16.9	17.6	17.3
<b>Production per inhabitant</b>	kg/inhabitant/year	507	510	513	494

Source: Ministry of Environment, WMIS  
Recalculated database WMIS (2009-2012)

NB: Data in the evaluation have been used according to the valid methodology for the given year - "Mathematical representation of calculation of the system of waste management indicators." Since 2009 the so called "Recalculated database" is used with increased production of waste including the "below threshold producers" in total waste production.

### **Trend:**

By analysing the data from the period 2009-2012, it may be stated that the total waste production over the last four years has a stagnant or a slightly declining trend, which is evident from Figure no. 1.

The total waste production in 2012 reached 30 023 thousand tons, in comparison with 2009 it decreased by 7 percentage points.

This trend may be influenced by several factors: a decline in construction activity, because 57.7% of waste generated in 2012 originated in construction, furthermore by the decline in industrial production during the economic crisis, but also by the fact that during the monitored period, certain types of materials were removed from the waste regime.

After the transposition of the Framework Directive 2008/98 /EC on Waste (hereinafter the „Framework Waste Directive"), it is possible to classify part of the waste stream as by-products, not subject to the Waste Act. In the past five years the total production of waste oscillates around the value of 30 million tons. This variation is mainly caused by fluctuations related to the economic stagnation, which is reflected among other things, by a decrease or increase in construction activity, which is one of the sectors producing large amounts of waste.

Total waste production of the category "Other" has a trend parallel to the total waste production.

The production of "other" waste in 2012 reached 28 386 thousand tons and compared to 2009, it decreased by 6 percentage points.

Hazardous waste represents a relatively small part of total waste production, only about 6%. Unambiguous trends of hazardous waste production may not be described. Hazardous waste

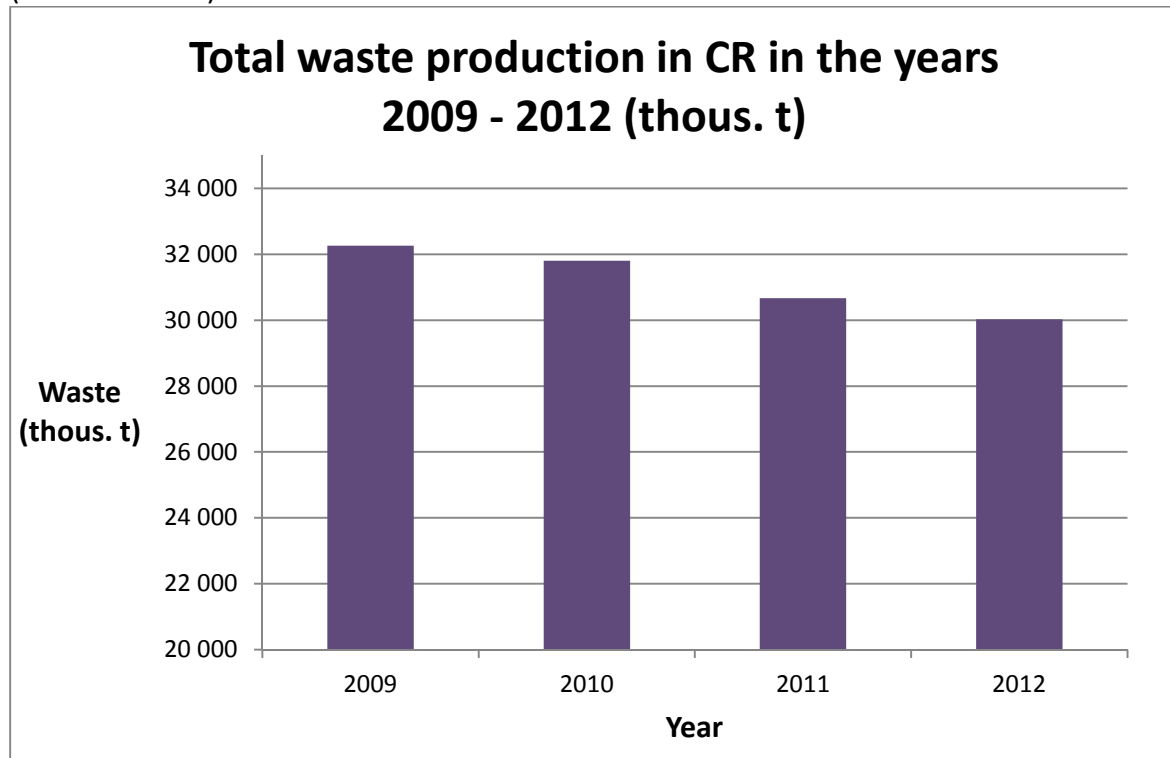
production is mainly driven by the state of the economy and the industry. The increased amount of hazardous waste was influenced by site decontamination, which took place in the respective years.

**Trend:**

The production of municipal waste in recent years (2009 - 2012) stagnates and oscillates around 5.3 million tons (see Figure no. 2).

Given the fact that municipal waste production is closely linked to the activities of physical persons, an important indicator is the specific production of municipal waste. In the period 2009 - 2012, the average production of municipal waste per inhabitant was 506 kg/inhabitant. Specifically, in 2012 this indicator reached the value 494 kg/inhabitant and in comparison with 2009, the decrease in specific production of municipal waste was 13 kg.

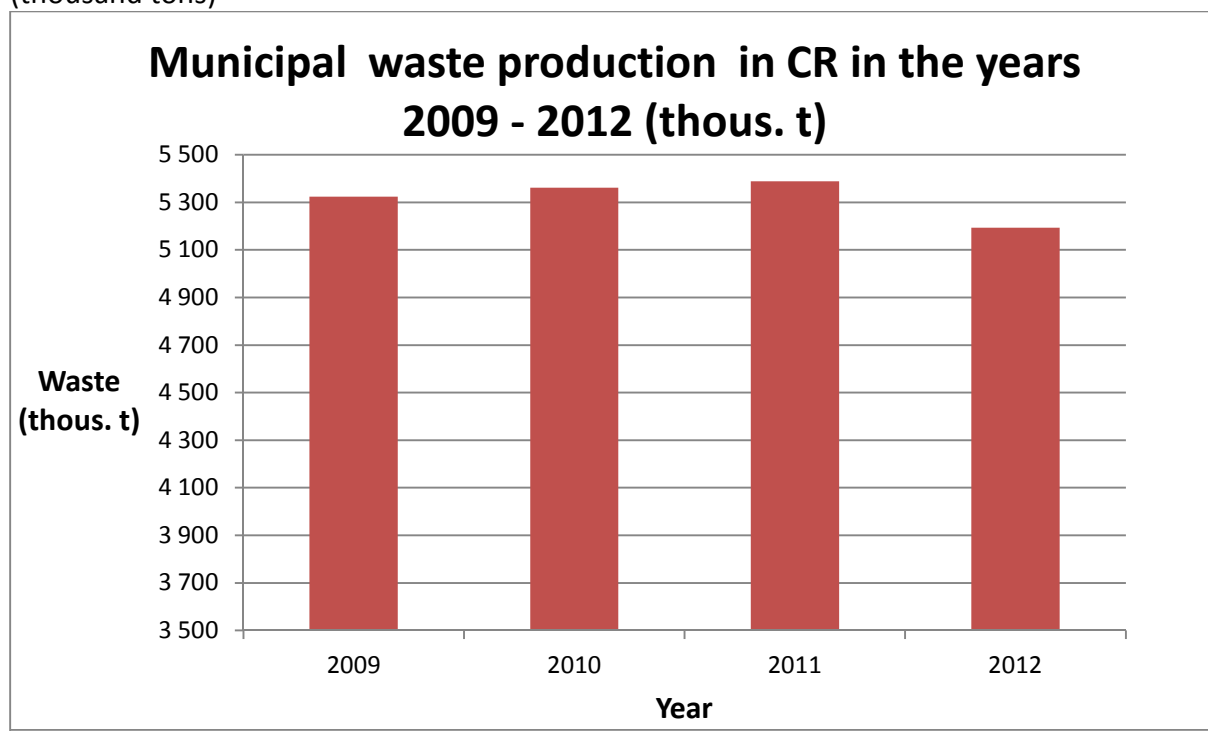
Figure 1: Total production of all waste types in the Czech Republic in the period 2009-2012 (thousand tons)



Source: Ministry of Environment, WMIS  
Recalculated database WMIS (2009 - 2012)



Figure 2: Production of municipal waste in the Czech Republic in the period 2009-2012 (thousand tons)



Source: Ministry of Environment, WMIS  
Recalculated WMIS database (2009-2012)

For the monitoring of waste production in the following period it is necessary to identify appropriate indicators and methodology of data processing that will not significantly change over time. It is also important to monitor the impact of other factors, such as converting some material streams from the waste status to e.g. raw material status (when waste ceases to be waste).

### **Waste Management**

Waste management may have a significant impact on human health and the environment. Waste management in the Czech Republic, as in other EU member states, is governed by the Framework Waste Directive, which establishes, inter alia, the hierarchy of waste management.

Data are based on the valid methodology for the given year, from the document "Mathematical representation of calculation of the system of waste management indicators."

For the unambiguous identification of trends the period 2009 – 2012 was selected for the evaluation.

Selected methods of waste management in the Czech Republic are shown in Table. 3.

Table 3: Selected recovery and disposal of total waste in the Czech Republic in the years 2009 -2012

	Unit	All waste			
		2009	2010	2011	2012
<b>Total waste production</b>	1000 tons/year	32 267	31 811	30 672	30 023
<b>Share of waste recovered</b>	% of total waste production	<b>75</b>	<b>74</b>	<b>78</b>	<b>79</b>
<b>Share of waste materially recovered</b>	% of total waste production	73	71	75	76
<b>Share of waste used for energy recovery</b>	% of total waste production	2.2	2.8	3.3	3.5
<b>Share of waste disposed of by landfilling</b>	% of total waste production	<b>14.6</b>	<b>13.5</b>	<b>12.6</b>	<b>12.7</b>
<b>Share of waste disposed of by incineration</b>	% of total waste production	0.21	0.27	0, 25	0.25

Source: Ministry of Environment, WMIS

Recalculated database WMIS (2009-2012)

Note: This table illustrates selected methods of recovery and disposal of waste. Data in the evaluation have been used according to the valid methodology for the given year - "Mathematical representation of calculation of the system of waste management indicators." Since 2009 the so called "Recalculated database" is used with increased production of waste including the "below threshold producers" in total waste production.

### **Trend:**

The share of recovered and materially recovered waste in total waste production grew steadily throughout the period under review (2009-2012).

In 2012, the recovery of total waste production compared to 2009 increased by 4 percentage points, reaching 79%, material recovery of the total waste production has increased compared to 2009 by 3 percentage points, reaching 76%.

Energy recovery from waste in the total production of waste is low throughout the period, at around 3%.

The share of waste disposed of in landfills in the total waste production decreased from 14.6 % in 2009 to 12.7% in 2012, which represents a decrease of about 2 percentage points.

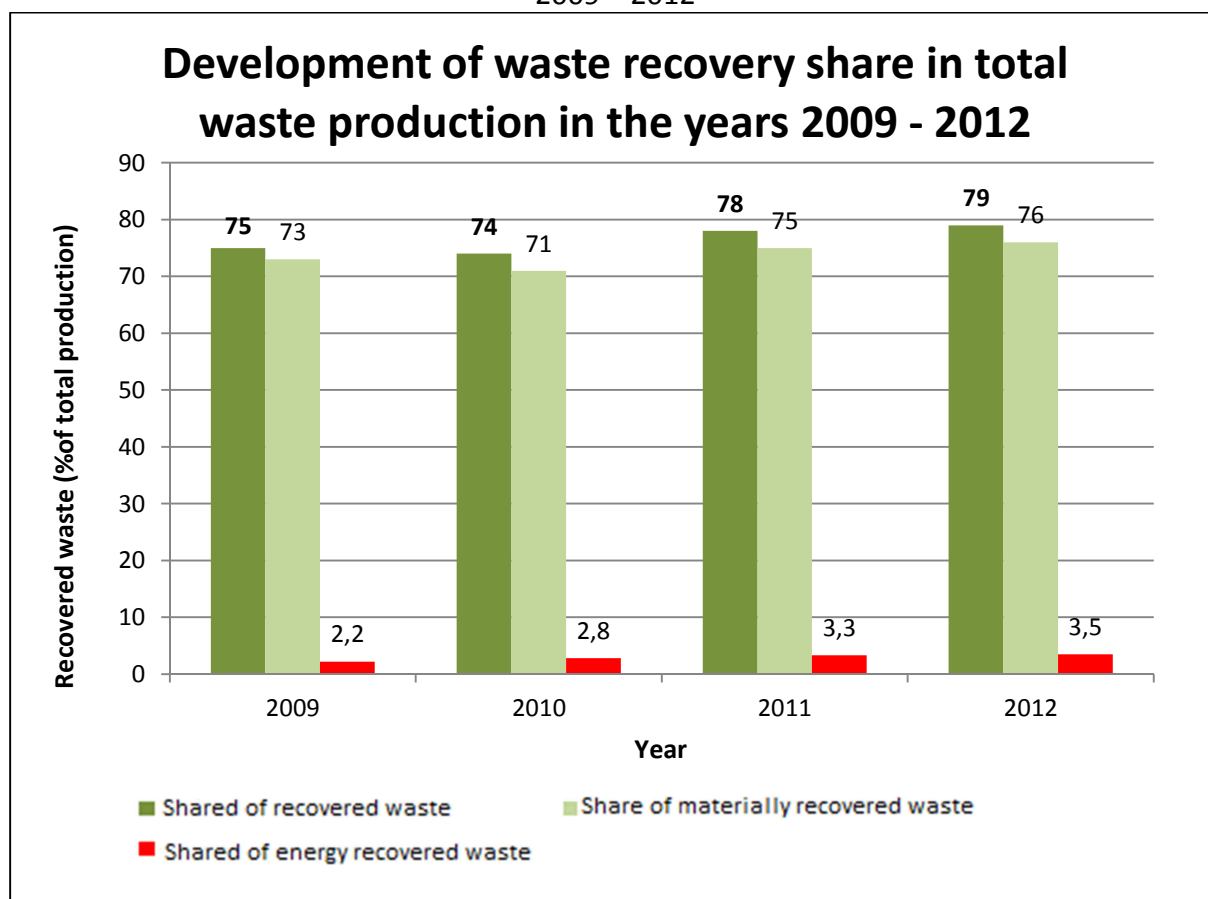
Another method of waste disposal is incineration. In the long term, the trend of incineration is rather stagnating. Every year, the share of incinerated waste is approximately 0.25%.

The most common method of waste disposal in 2012 is still the waste deposition at or below ground level (landfilling).

The effect of reducing the amount of landfilled waste is primarily the tightening of legal regulation of landfilling and the increasing share of recovered waste. The landfilling of untreated waste, with the exception of inert waste and waste for which treatment is technically unfeasible, or which cannot be modified by volume reduction or reduction or elimination of their hazardous properties, is prohibited in the Czech Republic. Landfilling of waste is regulated by Decree no. 294/2005 Coll., on conditions of waste landfilling and their use on ground surface, and amending Decree no. 383/2001 Coll., on details of waste management.

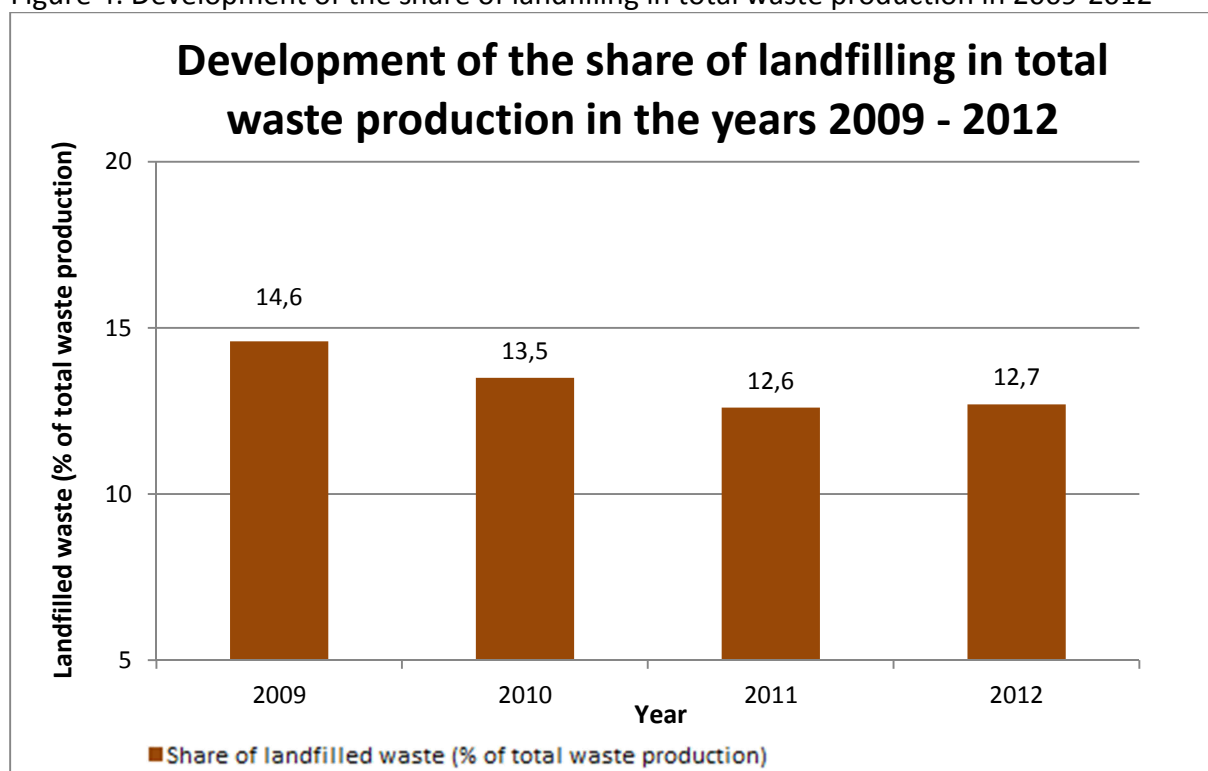
Figures no. 3 and no. 4 show the share of recovery and land filling of waste with respect to total waste produced in the period 2009 - 2012.

Figure 3: Development of the share of waste recovery in total waste production in the years 2009 – 2012



Source: Ministry of Environment, WMIS  
Recalculated database WMIS (2009 - 2012)

Figure 4: Development of the share of landfilling in total waste production in 2009-2012



Source: Ministry of the Environment, WMIS  
Recalculated database WMIS (2009 - 2012)

The Selected methods of municipal waste management in the Czech Republic are presented in Table no. 4.

Data are based on the valid methodology for the given year, the document "Mathematical expression of calculating the indicator system of waste management."

For the unambiguous identification of trends the period 2009 – 2012 was selected for the evaluation.

Table 4: Selected recovery and disposal methods of municipal waste in the Czech Republic in the years 2009-2012

	Unit	Municipal waste			
		2009	2010	2011	2012
<b>Total waste production</b>	1000 tons/year	5 324	5 362	5 388	5 193
<b>Share of waste recovered</b>	% of total waste production	<b>28.7</b>	<b>33.2</b>	<b>41.7</b>	<b>42.1</b>
<b>Share of waste materially recovered</b>	% of total waste production	22.7	24.3	30.8	30.4

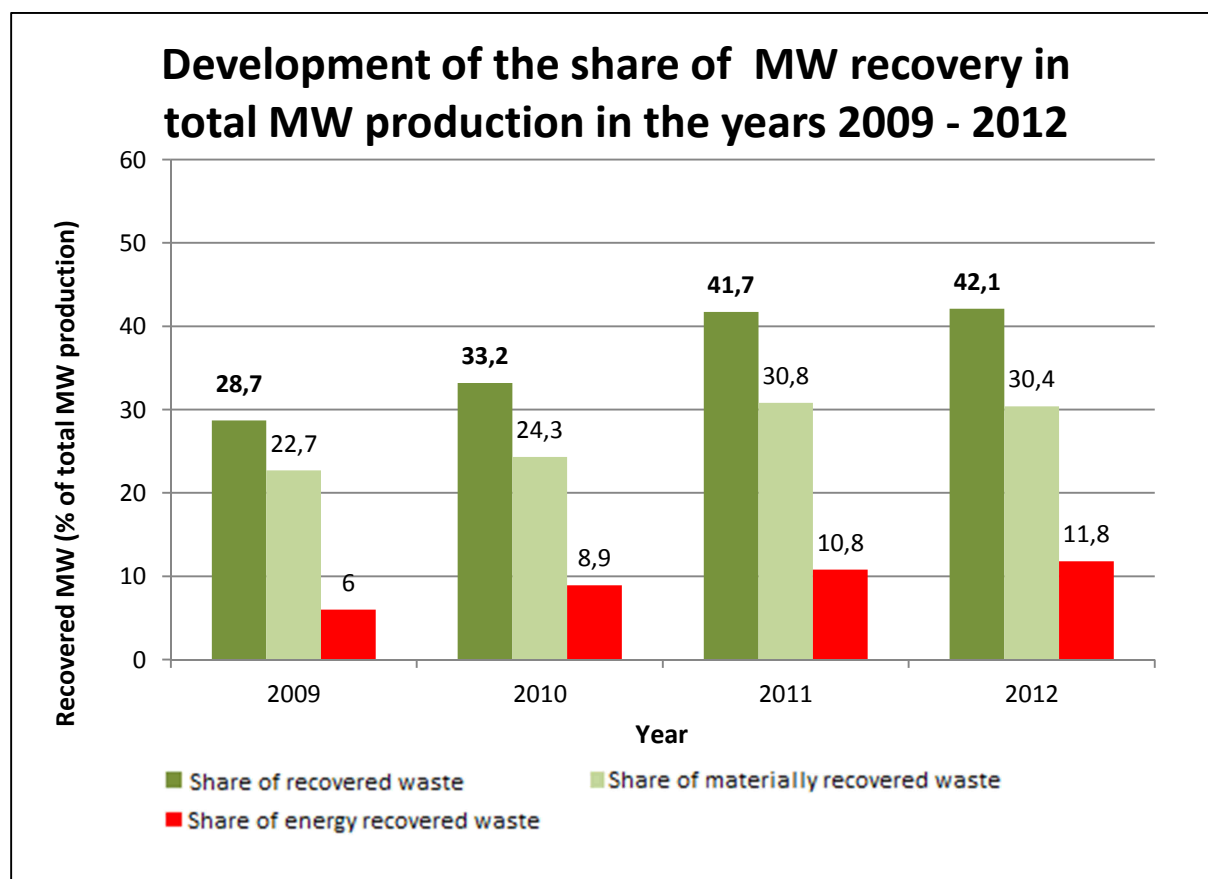
<b>Share of waste used for energy recovery</b>	% of total waste production	6	8.9	10.8	11.8
<b>Share of waste disposed of by landfilling</b>	% of total waste production	<b>64</b>	<b>59.5</b>	<b>55.4</b>	<b>53.6</b>
<b>Share of waste disposed of by incineration</b>	% of total waste production	0.04	0	0.04	0.04

Source: Ministry of Environment, WMIS  
Recalculated database WMIS (2009-2012)

Note: This table illustrates selected methods of recovery and disposal of waste. Data in the evaluation have been used according to the valid methodology for the given year - "Mathematical representation of calculation of the system of waste management indicators." Since 2009 the so called "Recalculated database" is used with increased production of waste including the "below threshold producers" in total waste production.

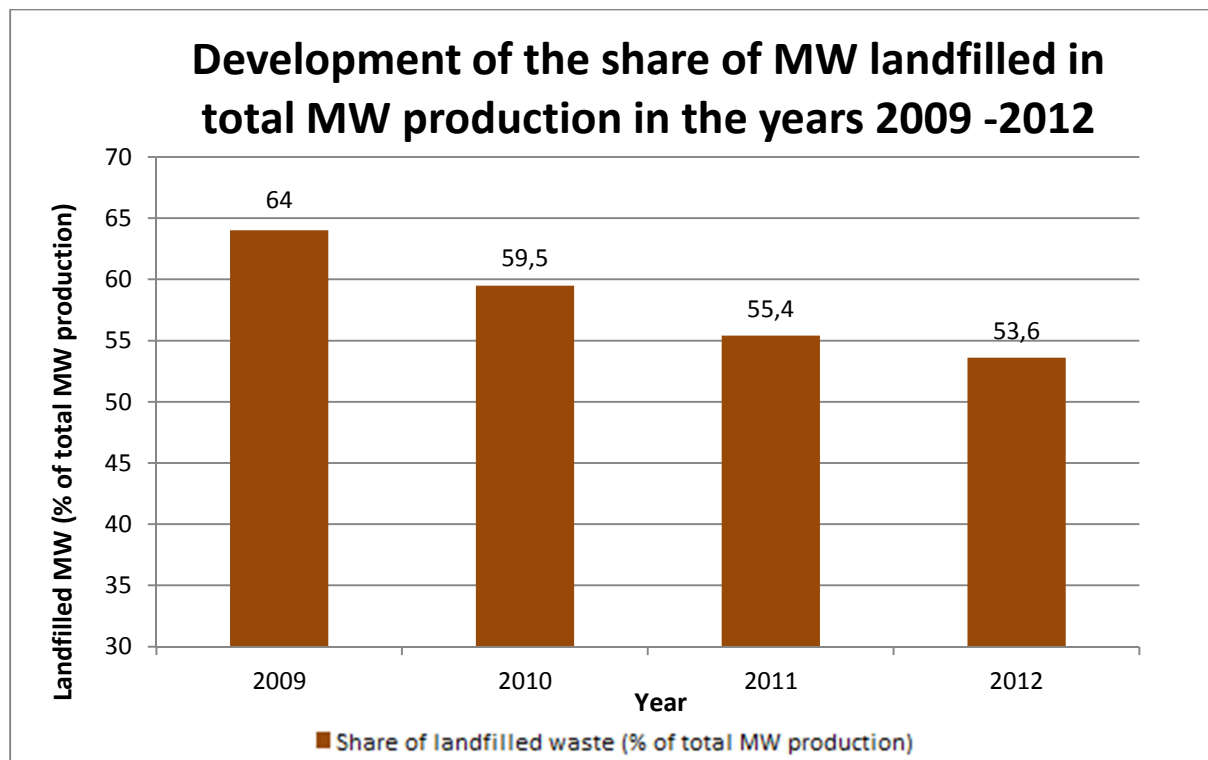
Figures no. 5 and no. 6 show the development of recovery and landfilling of municipal waste relative to the total municipal waste production in the period 2009 - 2012

Figure 5: Development of the share of recovery of municipal waste in total municipal waste production in the Czech Republic in the years 2009 – 2012



Source: Ministry of Environment, WMIS  
Recalculated database WMIS (2009 - 2012)

Figure 6: Development of the share of landfilling of municipal waste in total municipal waste production in the Czech Republic in the years 2009 – 2012



Source: Ministry of Environment, WMIS  
Recalculated database WMIS (2009 - 2012)

### **Trend:**

The share of recovered and materially recovered municipal waste (related to the production of municipal waste) in the period (2009-2011) increased. In 2012 the share remained at the same level as in 2011.

In 2012, the recovery of municipal waste increased compared to 2009 by about 13 percentage points, reaching already 42%, material recovery increased compared to 2009 by about 8 percentage points, reaching already 30%.

The energy recovery from municipal waste is still low, even though throughout the monitored period (2009 - 2012) it grew, in 2012 it increased by 6 percentage points compared to 2009, reaching 12%.

The most common method of disposal of municipal waste in 2012 is still deposition at or below ground level (landfilling).

The share of municipal waste landfilled, in the total production of municipal waste, decreased since 2009 from 64% to 53.6% in 2012, i.e. it decreased by about 10 percentage points.

### Current state of waste management - summary data on waste management in the Czech Republic in the years 2009 - 2012

Table 5: Production and management of all waste in the Czech Republic in the years 2009 - 2012

All waste	PRODUCTION	RECOVERED	Out of this MATERIAL RECOVERY	Out of this ENERGY RECOVERY	DISPOSED	Out of this LANDFILLED	OTHER MANAGEMENT
Year 2009	32.3 mil. t	74.5%	72.5%	2%	15%	15%	10.5%
Year 2010	31.8 mil. t	73.5%	71%	2.5%	13.5%	13.5%	13%
Year 2011	30.7 mil. t	78%	75%	3%	13%	13%	9%
Year 2012	30 mil. t	79%	75.5%	3.5%	13%	13%	8%

Source: Ministry of the Environment, WMIS

Note: Data in the evaluation have been used according to the valid methodology for the given year - "Mathematical representation of calculation of the system of waste management indicators", in accordance with Decree no. 383/2001 Coll., on details of waste management, as amended, applicable at the time.  
Since 2009 the so called "Recalculated database" is used with increased production of waste including the "below threshold producers" in total waste production.

Table 6: Production and municipal waste management in the Czech Republic in the years 2009 - 2012

Municipal waste	PRODUCTION	RECOVERED	Out of this MATERIAL RECOVERY	Out of this ENERGY RECOVERY	DISPOSED	Out of this LANDFILLED	OTHER MANAGEMENT
Year 2009	5.3 mil. t	29%	23%	6%	64%	64%	7%
Year 2010	5.4 mil. t	33%	24%	9%	59%	59%	8%
Year 2011	5.4 mil. t	42%	31%	11%	55%	55%	3%
Year 2012	5.2 mil. t	42%	30%	12%	54%	54%	4%

Source: Ministry of the Environment, WMIS

Note: Data in the evaluation have been used according to the valid methodology for the given year - "Mathematical representation of calculation of the system of waste management indicators", in accordance with Decree no. 383/2001 Coll., on details of waste management, as amended, applicable at the time.  
Since 2009 the so called "Recalculated database" is used with increased production of waste including the "below threshold producers" in total waste production.

### **Trend:**

From the perspective of the management of all waste from 2009 until today, there is a continuous positive trend of gradual increase in the share of recovered waste to the waste disposed.

This is mainly caused by the changes in technology ensuring greater efficiency in the manufacturing sector, as well as in the actual waste management and in the perception waste as a source of raw materials. The financial support for the recovery of waste from OPE 2007-2013 was also significant.

Since 2009, there was a slight decline in the share of waste disposed in the total waste production. This may have been caused by the manifestation of economic and financial crisis in the industrial sector and the concurrent diversion of some material streams from the waste status to a status of a by-product usable as a substitute for primary raw materials.

In the long term, landfilling dominates the municipal waste disposal.

### **Waste management structure:**

In terms of the structure of recovery and material recovery of waste, no significant changes are apparent in the past few years. In 2012, the use waste for landscaping still belongs among the most common ways of waste recovery (mainly construction and demolition waste is used in this way), together with recycling and reclamation of other inorganic materials.

The most common method of disposal of all types of waste still remains the placement at or below ground level, i.e. landfilling.

In municipal waste, disposal by landfilling dominates in the long term.

**The current trend of waste management in the Czech Republic generally reflects the waste management hierarchy, nevertheless in the area of municipal waste management the state complying with this hierarchy is not being achieved in the long term.**

Proper waste management as well as the conditions of operation of waste management facilities are regularly inspected by the Czech Environmental Inspection.

## **2.1.1 Overview of current waste management indicators**

Table No. 7 shows the current values of waste management indicators in 2012 from waste management indicator system.



Table 7: Waste management indicators in 2012

	GDP per inhabitant in PPS (as of October 3, 2013 source: Czech Statistical Office)	In PPS	20 297
	Average population in 2012 (source: Czech Statistical Office [online] October 3, 2013)	Inhabitants	10 509 286
	All waste	Unit	2012
I.1v	Total waste production	1000 tons/year	30 023.111
I.2v	Total waste production per unit of GDP	t/1000 PPS/year	0.14
I.3v	Share of total waste production	% of total production of all waste	100
I.4v	Production of all waste per inhabitant	kg/inhabitant/year	2857
I.5v	Share of all waste recovered (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	% of total production of all waste	79.26
	Quantity of all waste recovered (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15),	1000 tons/year,	23 794.832
I.6v	Share of all waste (R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	% of total production of all waste	75.76
	Quantity of materially recovered of all waste (R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	1000 tons/year	22 744.385
I.7v	Share of all waste used for energy recovery (R1)	% of total production of all waste	3.50
	Quantity of all waste used for energy recovery (R1)	1000 tons/year	1 050.446

I.8v	Share of all waste deposited in landfills (D1, D5, D12)	% of total production of all waste	12.65
	Quantity of all waste deposited in landfills (D1, D5, D12)	1000 tons year	3 798 915
I.9v	Share of all waste disposed of by other deposition (D3, D4)	% of total production of all waste	0.09
	Quantity of all waste disposed of by other deposition (D3, D4)	1000 tons/year	27.038
I.10v	Share of all waste disposed of by incineration (D10)	% of total production of all waste	0.25
	Quantity of all waste disposed of by incineration (D10)	1000 tons/year	76.275
I.1n	Total production of hazardous waste	1000 tons/year	1 636.790
I.2n	Total production of hazardous waste per unit of GDP	t/1000 PPS/year	0,008
I.3n	Share of total hazardous waste production in total production of all waste	%	5.45
I.4n	Hazardous waste production per inhabitant	kg/inhabitant/year	155.75
I.5n	Share of recovered hazardous waste (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	% of total production of hazardous waste	40.50
	Quantity of recovered hazardous waste (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	1000 t/year	662.860
I.6n	Share of materially recovered hazardous waste (R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	% of total production of hazardous waste	37.97
	Quantity of materially recovered hazardous waste (R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	1000 t/year	621.409
I.7n	Share of waste used for energy recovery (R1)	% of total production of	2.53

		hazardous waste	
	Quantity of hazardous waste used for energy recovery (R1)	1000 tons/year	41.451
I.8n	Share of hazardous waste disposed of by landfilling (D1, D5, D12)	% of total production of hazardous waste	2.09
	Quantity of hazardous waste disposed of by landfilling (D1, D5, D12)	1000 tons/year	34.178
I.9n	Share of hazardous waste disposed of by other deposition (D3, D4)	% of total production of hazardous waste	0.00
	Quantity of hazardous waste disposed of by other deposition (D3, D4)	1000 tons/year	0.000
I.10n	Share of hazardous waste disposed of by incineration (D10)	% of total production of hazardous waste	4.33
	Quantity of hazardous waste disposed of by incineration (D10)	1000 tons/year	70.943
	Other waste		2012
I.1o	Total production of other waste	1000 tons/ year	28 386.321
I.2o	Total production other waste per unit of GDP	t/1000 PPS/year	0.133
I.3o	Share of total production of other waste in production of all waste	%	94.55
I.4o	Production of other waste per inhabitant	kg/inhabitant/year	2 701.07
I.5o	Share of recovered other waste (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	% of total production of other waste	81.49
	Quantity of recovered other waste (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	1000 tons/year	23 131.972
I.6o	Share of materially recovered other waste (R2, R3, R4,	% of total production of	77.94

	R5, R6, R7, R8, R9, R10, R11 R12, N1, N2, N8, N10, N11, N12, N13, N15)	other waste	
	Quantity of materially recovered other waste (R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	1000 tons/year	22 122.976
I.7o	Share of other waste used for energy recovery (R1)	% of total production of other waste	3.55
	Quantity of other waste used for energy recovery (R1)	1000 tons/year	1009.00
I.8o	Share of other waste deposited in landfills (D1, D5, D12)	% of total production of other waste	13.26
	Quantity of other waste disposed of by landfilling (D1, D5, D12)	1000 t/year	3 764.736
I.9o	Share of other waste disposed of by other deposition (D3, D4)	% of total production of other waste	0.10
	Quantity of other waste disposed of by other deposition (D3, D4)	1000 tons/year	27.038
I.10	Share of other waste disposed of by incineration (D10)	% of total production of other waste	0.02
	Quantity of other waste disposed of by incineration (D10)	1000 tons/year	5.331
	<b>Municipal waste</b>		<b>2012</b>
I.1k	Total municipal waste production	1000 tons/year	5 192.784
I.2k	Total municipal waste production per unit of GDP	t/1000 PPS/year	0.024
I.3k	Share of total production of municipal waste in total waste production	%	17.30
I.4k	Production of municipal waste per	kg/inhabitant/year	494.11
I.5k	Share of recovered municipal waste (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8 N10, N11, N12, N13, N15)	% of total production of municipal waste	42.11

	Quantity of recovered municipal waste (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15),	1000 tons/year	2 186.886
I.6k	Share of materially recovered municipal waste (R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	% of total municipal waste production	30.36
	Quantity of materially recovered municipal waste (R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, N1, N2, N8, N10, N11, N12, N13, N15)	1000 tons/year	1 576.519
I.7k	Share of municipal waste used for energy recovery (R1)	% of total municipal waste production	11.75
	Quantity of municipal waste used for energy recovery (R1)	1000 tons/year	610.367
I.8k	Share of municipal waste disposed of by landfilling (D1, D5, D12)	% of total production of municipal waste	53.64
	Quantity of municipal waste disposed of by landfilling (D1, D5, D12)	1000 tons/year	2 785.555
I.9k	Share of municipal waste disposed of by other deposition (D3, D4)	% of total production of municipal waste	0.00
	Quantity of municipal waste by other deposition (D3, D4)	1000 tons/year	0.00000
I.10k	Share of municipal waste disposed of by incineration (D10)	% of total production of municipal waste	0.04
	Quantity of municipal waste disposed of by incineration (D10)	1000 tons/year	2.109
	Supplementary indicators		2012
I.19	Number of hazardous waste collection sites	site	116

I.20	Share of hazardous waste from health care in total production of medical waste	%	87.87
	Total waste production from human health care	t	35 741
	Total quantity of hazardous waste from human health care	t	31 407
I.21	Production of separately collected municipal waste and packaging (subgroup 20 01 and 15 01 from municipalities)	kg/inhabitant/year	123.45
I.22	Share of biodegradable municipal waste (BDMW) deposited in landfills, compared to 1995 reference level	%	79.57
	Quantity of BDMW landfilled	t	1 237 661
<b>Specific indicators</b>			<b>2012</b>
I.23	Share of construction and demolition waste in total waste production	% of total waste production	46.26
	Total production of construction and demolition waste	t	13 888 042.42
I.24	Share of recovered construction and demolition waste	% of total production of construction and demolition waste	95.14
	The total amount of recovered construction and demolition waste	t	13 212 856.51
I.25	Share of construction and demolition waste disposed of in landfills	% of total production of construction and demolition waste	3.93
	Total quantity of construction and demolition waste deposited in landfills	t	546 111.86
I.27	Total production of waste containing PCBs	t/year	178
I.28	Total production of waste oils	t/year	26 184
I.29	Total production of waste batteries and accumulators	t/year	28 763
I.30	Total production of sludge from sewage treatment plants	t/year	162 040
I.31	Share of sludge from sewage treatment plants used on agricultural land	% of total production of sludge	22.07
	Total quantity of sludge from sewage treatment plants on agricultural land	t	35 762.41
I.32	Total production of asbestos waste	t/year	28 356

I.33	Total production of wrecked cars	t/year	116 611
I.34	Fulfilling performance objectives for recycling and recovery of packaging waste, per structure of Annex no. 3 of the Act on Packaging	%	see below

I.34	Fulfilling performance targets for recycling and recovery of packaging waste, per structure of Annex no. 3 of the Act on Packaging	<b>Indicator I.34 for the Czech Republic - 2012</b>	
	<b>Material</b>	Recycling in %	Total recovery in %
	Paper and cardboard	86	86
	Glass	82	82
	Plastic	66	66
	Metals	68	68
	Wood	26	30
	<b>Total</b>	<b>72</b>	<b>72</b>

Source: Ministry of Environment

## 2.3 Summary of analytical part of WMP CR

Waste management in Czech Republic has undergone considerable changes in the past 20 years to reach the current level, i.e. when a system that generally corresponds to the current requirements of European legislation is in place.

In terms of further development, it is necessary to adjust and complete some waste management areas, in accordance with the principle of strengthening the shift to higher levels of the hierarchy of waste management (particularly the area of waste prevention, recycling and recovery, including energy recovery from waste).

Substantial changes in legislation are currently being implemented, mainly reflecting the development of EU waste management legislation.

### 2.3.1 Trends and evaluation of waste management

#### Production of waste

On the basis of data evaluation from the period 2009 - 2012 from the Waste Management Information System (WMIS), the total waste production in recent years has a stagnating or a slightly decreasing trend, with the production ranging around 30 million tons.

The total production of waste category "other" has a parallel trend to the total waste production. Developments in the most important groups of waste (by weight) within the category "other", indicate a decrease in the production of most waste. Production of waste

from construction (group 17) is variable, depending on the developments in the construction industry, in relation to the developments in the economy. The production of municipal waste (group 20 and subgroup 15 01 (from municipalities) of the Waste Catalogue<sup>3</sup>) has been rather stagnant in recent years (2009-2012).

Hazardous waste represents a relatively small part of the total waste production, only about 6%. Clear trends for production of hazardous waste cannot be described. Hazardous waste production is mainly driven by the state of the economy and industry. In the last three years (2010 - 2012) it has stagnated. The production varies overall and also in the majority groups of hazardous waste.

## **Waste management**

The share of recovered and materially recovered waste in the total waste production over the entire study period (2009 - 2012) grew steadily. In 2012, the recovery in total waste production achieved 79% and material recovery 76% of total waste production. Recovery of energy from waste out in total waste production is low; throughout the whole period it was around 3%.

The share of waste deposited in landfills in the total waste production amounted to 12.7% in 2012. Another method of waste disposal is incineration, which has a minority share in total waste production disposal, only about 0.25%.

From the perspective of all waste management, from 2009 until today, there is a continuously positive trend of gradual increase in the proportion of recovered waste to the waste disposed. This was mainly due to the changes in technology leading to a greater efficiency both in the manufacturing sector and in the area of waste management itself, and due to the perception of waste as a source of raw materials. Also significant was the financial support for waste recovery facilities from OPE 2007-2013.

With the exception of municipal waste, recovery prevails among all of the major groups of waste.

Since 2009, there was a slight decline in the share of waste disposed in the total waste production. This may have been caused by the manifestation of economic and financial crisis in the industrial sector and the concurrent diversion of some material streams from the waste status to a status of a by-product usable as a substitute for primary raw materials.

In terms of the structural types of recovery and material recovery of waste, no significant changes were recorded over the past several years. In 2012, amongst the most common methods of waste utilization were landscaping, recycling, and reclamation of other inorganic materials.

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<sup>3</sup> Decree no. 381/2001 Coll., laying down the Catalogue of Waste, List of Hazardous Waste and lists of waste and countries for the purpose of export, import and transit of waste and the procedure for granting permission for export, import and transit of waste (The Waste Catalogue).



The most common method of disposal of waste (category O-other and H-hazardous) is still the deposition at or below ground level (landfilling).

The most common way of hazardous waste management is the treatment of waste. By this adjustment, waste may lose one or more of the hazardous properties and thus its waste category may be changed to the status of "other" waste. Most of hazardous waste, however, will likely be disposed of in the future. In the final disposal of hazardous waste incineration prevails over deposition in a secure landfill.

The current trend of waste management in the Czech Republic generally corresponds to waste hierarchy, however, in municipal waste management the state corresponding to this hierarchy is not being achieved in the long term.

Proper waste management and operating conditions of waste management facilities are inspected by CEI.

### **Municipal waste**

In 2012, 54% of municipal waste (group 20 and subgroup 15 01 (from municipalities) of the Waste Catalogue) out of the total municipal waste produced, was landfilled, 42% recovered, 30 % materially recovered, and 12% achieved energy recovery. At the current production of around 5.3 million tons of municipal waste per year, there is still room to increase the capacity of facilities for the material and energy recovery of municipal waste.

The share of recovered and materially recovered municipal waste (related to the production of municipal waste) in the period (2009 - 2011) increased. In 2012 it remained at the same level as in 2011.

When comparing the quantity of landfilled municipal waste over the last four years (2009 - 2012), it can be seen that gradually every year there is a slight decrease in the quantity of municipal waste deposited at landfills, in 2012 the quantity of landfilled municipal waste decreased compared to 2009 by 624 217 tons.

The most common method of disposal of municipal waste in 2012 was the deposition at or below ground level (landfilling). The share of municipal waste disposed of by landfilling in the total production of municipal waste, decreased since 2009 from 64% to 54% in 2012, which represents a decrease of about 10 percentage points.

### **Biodegradable municipal waste**

The most important types (by weight) of biodegradable municipal waste (BDMW) which can be considered as problematic in terms of management, are mixed municipal waste (MMW) and bulk waste. The predominant form of waste management of municipal waste is landfilling. Most municipal waste deposited at a landfill is represented by mixed municipal waste. Separate collection of BDMW in the Czech Republic is currently mainly focused on green waste from gardens and parks and other suitable waste of plant origin. At present, most mixed municipal waste is landfilled at S-OO type landfills or is used for energy recovery in facilities for the energy recovery of municipal waste (waste to energy installation - WTEI).

In 2012 about 2.3 million tons of mixed municipal waste and 0.4 million tons of bulk waste were landfilled. In 2012, compared to 2009, a decrease in the quantity of disposed mixed municipal waste was observed, by about 471 166 tons. Additionally, in 2012 approximately 0.6 million tons of municipal waste was energy recovered in WTEI. The capacity of WTEI in the Czech Republic is currently at 654 000 tons of MW/year.

As an environmentally acceptable way of utilization of the residual mixed municipal waste (after sorting materially recoverable components) in the Czech Republic, seems to be the energy recovery in facilities for energy recovery (WTEI) with direct combustion, potentially in other facilities for this purpose, in accordance with current applicable legislation.

The priority to meet the strategic diversion from BDMW landfilling is to support the construction of facilities for the recovery of mixed municipal waste. The Czech Republic does not consider the mechanical-biological treatment of waste as waste final recovery.

### **Fulfilment of European objectives and targets**

In accordance with the Commission Decision 2011/753/EU, establishing rules and calculation methods for verifying compliance with the objectives set out in the Directive of the European Parliament and Council Directive 2008/98/EC on waste, using method 2 of calculating the objective, the Czech Republic in the year 2010 attained 45.5 % recycling of paper, metal, plastic, glass - components of household waste and similar waste. The assumption is that in 2020 the objective of the Waste Directive (50%) will be achieved.

Collection of the four commodities (paper, plastic, glass, metal), which is required by the Waste Directive, has now been introduced by about 1/4 of municipalities (70% of inhabitants). In most municipalities, separate containers are provided for the collection of paper, plastics, and glass. The availability of containers for recoverable waste collection in municipalities is constantly improving, as evidenced by the increasing density of the collection network and decreasing delivery distance. The collection of metals most commonly occurs in collecting yards and at scrap metal traders.

The levels of recycling and recovery of construction and demolition waste in the Czech Republic are in the long term very high (in 2012 over 90%), so even now the European objective for the recovery rate of construction and demolition waste is complied with.

By taking into account the methodology for calculating the production of BDMW in 1995, and when compared with the maximum quantity of BDMW that could be in 2010 deposited in landfills, the Czech Republic in 2010 has met the objective of Council Directive 1999/31/EC on the landfill of waste. The Czech Republic is aware of the provisions of the Directive on the reduction of the share of BDMW landfilled also in the target years 2013 and 2020. There is a possibility that it would not be possible to meet these objectives, therefore it is necessary to take certain precautions, see the binding part of WMP CR.

## **End-of-life products**

The Czech Republic has introduced a system of take-back and separate collection of end-of-life products.

The Czech Republic has a fully functional and developed integrated system for the collection of packaging waste; a relatively accessible and dense collection network has been created. The rate of recycling and the overall recovery of packaging waste are increasing every year. In the whole monitored period (2005 - 2012), despite the impact of the economic crisis on the recycling industry in the years 2008 and 2009, the quantity of waste recycled increased, and the share of recycled and recovered packaging waste has been around 70% in the long term. The Czech Republic fulfils the European objectives in waste management.

Take-back services for electrical equipment in the Czech Republic are provided by several collective systems. The Czech Republic meets the EU quotas for minimum collection efficiency and the recovery of electrical and electronic equipment. The Czech Republic is struggling with illegal processing or removing of valuable components from waste electrical and electronic equipment. Also, the electrical waste streams are insufficiently recorded and it is necessary to strengthen the function of monitoring of the collective systems.

In 2011, thanks to the collection system of portable batteries and accumulators, the Czech Republic managed to meet early the objectives set for 2012. The efficiency of collection mainly of automotive batteries and accumulators is at a high level in the Czech Republic. Despite the problems, the Czech Republic will apparently attain the minimum efficiency of collection of portable batteries for 2016 (45%). To achieve this objective, focus will be needed on information campaigns and motivation of end users to promote the proper management of waste batteries and accumulators.

In 2002 tires were included among the products with compulsory take-back. This obligation, however, was complied with only by a part of the liable parties. Some liable parties either did not fulfil their obligations at all or only to a minimal extent. For this reason, in 2013 the Waste Act was amended to implement mandatory registration in the list of liable persons and a minimum level of take-back of 35% was implemented for the first time for 2014. To meet the minimum level of take-back, which will increase over time, a collective compliance with the obligations of liable persons will be allowed.

Wrecked cars as specific selected end-of-life products are collected only in locations that have the consent of regional authorities to collect wrecked cars. These collection points must meet the requirements provided in the Decree no. 352/2008 Coll. The excessive number of collection points and treatment facilities, however, reduces the possibility of facility operation oversight and the quality of wrecked cars processing. Wrecked cars do not have a set collection rate, but Member States should establish a system that allows deregistration of a vehicle only upon a presentation of a certificate of acceptance issued by a wrecked cars collection facility. It follows that the number of vehicles collected should be the same or should approach the number of vehicles taken off the central vehicle register.

## **Fulfilment of European objectives and targets**

The Czech Republic meets the requirements of the European Directive on Packaging and Packaging Waste, Waste Electrical and Electronic Equipment Directive, Directive on batteries and accumulators and waste batteries and accumulators.

The Czech Republic is aware of the difficulty of achieving the target, i.e. the level of collection of portable batteries and accumulators of 45%, in accordance with the Directive 2006/66/EC, for the year 2016.

Also at the European level, the question of the attainability of new targets for the separate collection of waste electrical and electronic equipment, according to the revised Directive 2012/19/EU, for the year 2021 at 65%, remains.

In 2013 the Czech Republic has met the set objectives for the re-use and recovery of accepted selected end-of-life vehicles (wrecked cars) and their parts, to the extent of at least 85% of their average weight, and the re-use and recycling of these vehicles and their parts to the extent of at least 80% of their average weight. From 2015 the objectives for re-use and recovery of accepted selected end-of-life vehicles and their parts will be increased, pursuant to the Directive 2000/53/EC on end-of-life vehicles, to 95% of their average weight and the re-use and recycling of the vehicles and their components to 85% of their average weight. To meet these ambitious objectives the Czech Republic must tighten the requirements for the processing facilities and refine the method of reporting.

## **Waste management facility network**

The details of currently operated facilities for waste management are very important for the strategic management of the waste management sector, and therefore a comprehensive legislation amendment is anticipated to ensure the provision of relevant data on the facilities.

To meet all of the objectives of the European legislation and to fulfilling the forecasted development of waste management, it will be necessary to provide a comprehensive and effective network of waste management facilities at national and regional<sup>4</sup> level, in accordance with the general principles of "self-sufficiency and proximity" and also with the intent to comply with the European waste management hierarchy.

Investments in waste management facilities and other waste management infrastructure will be fundamental for the future.

The network of waste management facilities will include different types of facilities of different capacities and importance, with regard to the integration of the single facilities into waste management system.

Emphasis will be placed on modern innovative technology.

With the development of separate collection, new facilities will be established and also it will be necessary to reconstruct and expand the existing facilities.

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<sup>4</sup> For the purpose of this WMP CR document, the term region may be considered to represent an administrative region.

Waste management facilities operated in the Czech Republic are the mainstay of functional waste management.

### **Existing waste management facility network**

At the end of 2013, 1530 waste collection yards, more than 14 800 locations for electrical and electronic equipment take-back, more than 17 000 locations for take-back of portable batteries and accumulators operated the Czech Republic. At the end of 2013, a total of 534 legal entities had a valid consent to operate a facility for the collection and processing of wrecked cars.

In the year 2014, 479 facilities for waste sorting operated in the Czech Republic. Important are the facilities for the treatment of sorted materially recoverable components of municipal waste (commodities), especially the facilities for the processing of glass, paper, plastics, and metals. 116 final sorting lines are currently operated in the Czech Republic. The majority of products manufactured by the final sorting and processing of separately collected waste are freely tradable on the international market. Part of the raw materials derived from municipal waste is processed in the Czech Republic.

The processing of treated waste is particularly undertaken by: foundries, large glassworks (2 facilities), paper mills (20 facilities, 16 licensed by IPPC), single-plastics processing facilities (50) and mixed plastics processing facilities (approximately 5).

In 2014, the number of registered facilities for recycling waste was 583 (this number includes all facilities performing: acquisition/recovery of solvents, recycling/recovery of metals and metallic compounds, recycling/recovery of other inorganic materials, extracting catalyst components).

The facilities for waste disposal are a part of the network of facilities.

As of June 30, 2014 a total of 178 landfills were operated on the territory of the Czech Republic.

Waste of the category "other" and "hazardous" may be deposited in landfills S-IO, S-OO, S-NO, in accordance with the provisions of Decree no. 383/2001 Coll., on details of waste management and Decree no. 294/2005 Coll., on conditions of depositing waste at landfills, as amended, and in accordance with the operating rules of each facility .

In 2014, waste of the category "other" may be deposited at a total of 152 landfills with free capacity exceeding 30 million m<sup>3</sup>.

At present (2014), 39 landfills, where inert waste may be deposited (S-IO), are operated on the territory of the Czech Republic.

Additionally, in 2014, 25 landfills capable of accepting hazardous waste, designated according to the Decree no. 294/2005 Coll., on conditions of landfilling as S-NO, operated in the Czech Republic. Of this number, only 4 are landfills exclusively accepting hazardous waste. In 2014, the total free capacity of landfills accepting hazardous waste was 6509946 m<sup>3</sup>.

3 facilities for energy recovery from waste (combined heat and power generation), so called WTEI, with an annual capacity of 654,000 tons, are currently in operation on the territory of the Czech Republic.

Energy recovery from hazardous waste (category N) and alternative fuels produced from waste occurs during co-incineration in facilities for the production of cement (cement plants). The number of these facilities in the Czech Republic is 5, with a capacity of 250 000 t/year.

Additionally, in 2014, 9 hazardous waste incinerators with a total annual capacity of 60658 tons/year operated the Czech Republic.

Operation of all of these facilities complies with the current legislative requirements.

At the end of 2013, facilities capable of incinerating medical waste numbered 27 in total (these are the facilities where in 2013 this waste was incinerated and reported, and the facilities possess the relevant permits).

At the end of 2013, the network of authorized collection and treatment facilities for wrecked cars numbered 534 businesses, of which 498 entities were active businesses. In 2013, out of the total number of active facilities 498, 244 facilities on the average accepted less than 10 wrecks per month, and 206 facilities accepted 11-50 wrecked cars per month.

In 2014, among other facilities registered for waste management were the facilities for crushing waste (number 766), including facilities for crushing wrecked cars (4), and facilities for crushing electric waste (number 13).

The number of other facilities, e.g. for dismantling of electrical and electronic waste, is 119.

Important parts of the facility network are the facilities for the processing of bio-waste in the Czech Republic.

In the Czech Republic, according to actual data provided by the regional authorities, there are 189 composting facilities authorized under § 14, paragraph 1, of the Act, 143 community composting facilities, and small facilities according to § 33b, of the Act, and 60 composting facilities under the IPPC regime.

At present, according to the Czech Biogas Association, a total of 326 biogas stations producing electricity with an installed capacity of 224.17 MW are operated in the Czech Republic. Biogas stations in operation processing municipal waste number 8, according to the Czech Biogas Association.

One facility for mechanical sorting and treatment of biological waste components is currently under construction in the Czech Republic. It is the so called mechanical/biological processing of waste (MBT) with an annual design capacity of 60 000 t of processed waste.

## 2.4 Forecast of municipal waste production in the Czech Republic for the year 2024

The Ministry of Environment commissioned the Masaryk University (MU) in Brno<sup>5</sup> [1] to draw up the forecast of municipal waste production. In 2013, in collaboration with the Ministry of Environment, the report was finalized and is based on historical trends in municipal waste production and waste management in the Czech Republic and the EU, taking into account the development and prognosis of the Czech economy, the objectives of European legislation and all of the relevant documents of the EU and the Czech Republic in the field of waste management, especially the draft WMP CR 2015 - 2024 and the methodological guidelines of the European Commission for Waste prevention programmes.

Furthermore, publicly available data on population and macroeconomic indicators provided by the Czech Statistical Office, Ministry of Interior, Ministry of Regional Development, Komerční banka, Ministry of Finance Czech Republic, were taken into account. Also used was research conducted by the Institute of Biostatistics and Analyses (IBA MU).

**The forecast of municipal waste production in the Czech Republic for the period of 10 years (until the year 2024) has been developed,** with municipal waste divided into the following categories:

- **Municipal waste** (group of 20 from all subjects and 15 01 from the system of municipalities)
- **Municipal waste** (group of 20 from municipalities and 15 01 from the system of municipalities);
- **Mixed municipal waste** (total from all subjects);
- **Mixed municipal waste** (from the system of municipalities)
- **Biodegradable municipal waste** (This waste is provided in Table no. 8 and recalculated using the content share coefficients)

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<sup>5</sup> The Report „Forecast of municipal waste production and management in the Czech Republic in the period 2013 - 2024“ was prepared on the basis of a contract between the Ministry of Environment and the Institute of Biostatistics and Analyses, Masaryk University, concluded in 2013.

<b>Catalogue number of waste type</b>	<b>Designation</b>	<b>Coefficients of biodegradable waste share in municipal waste</b>
15 01 01 <sup>a</sup>	Paper and cardboard packaging	1
20 01 01	Paper and cardboard	1
20 01 08	Biodegradable kitchen and canteen waste	1
20 01 10	Garments	0.75
20 01 11	Textile materials	0.75
20 01 38	Wood other than catalogue no. 20 01 37	1
20 02 01	Biodegradable waste (from gardens and parks)	1
20 03 01	Mixed municipal waste	0.48
20 03 02	Waste from marketplaces	0.75
20 03 03	Street sweepings	0.10
20 03 07	Bulk waste	0.30

Legend: <sup>a</sup> Waste catalogue no. 150101 from municipalities

- **Materially recoverable components of municipal waste**

This is the forecast for commodities: **paper; plastics; glass; composite packaging; textiles; metals.**

Recoverable components of municipal waste include waste of the group of 20, provided in Table no. 9.

<b>Catalogue number of waste type</b>	<b>Designation</b>
20 01 01	Paper and cardboard
20 01 02	Glass
20 01 39	Plastics
20 01 40	Metals
20 01 10	Garments
20 01 11	Textile materials
15 01 01	Paper and cardboard packaging
15 01 02	Plastic packaging
15 01 04	Metallic packaging
15 01 05	Composite packaging
15 01 07	Glass packaging
15 01 09	Textile packaging

A component of recoverable municipal waste is also the used packaging that can be collected within the municipal collection systems, and which is reported in sub-group 15 01 of the Waste Catalogue. Specific types of waste of group 20 and group 15 01 of the Waste catalogue are provided in Table 9. Additionally, the share of materially recoverable



components is determined in mixed municipal waste (20 03 01) and added to the total weight of materially recoverable components in municipal waste.

- **Hazardous components of municipal waste** (municipal waste group 20 designated as hazardous in the Waste Catalogue) are provided in Table no. 10.

<b>Table 10: Hazardous components of municipal waste</b>	
<b>Catalogue number of waste type</b>	<b>Designation</b>
20 01 13	Solvents
20 01 14	Acids
20 01 15	Bases
20 01 17	Photochemicals
20 01 19	Pesticides
20 01 21	Fluorescent tubes and other mercury containing waste
20 01 23	Discarded equipment containing chlorofluorocarbons
20 01 26	Oil and fat other than those mentioned in 20 01 25
20 01 27	Paints, inks, adhesives and resins containing hazardous substances
20 01 29	Detergents containing hazardous substances
2001 31	Unspent cytostatic medicines
20 01 32	Other unspent medicines than those mentioned in 20 01 31
20 01 33	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries
20 01 35	Discarded electrical and electronic equipment containing hazardous substances other than those mentioned in 20 01 21 and 20 01 23
20 01 37	Wood containing hazardous substances

The source of the data for determining the production and methods of waste management was the Waste Management Information System WMIS (recalculated database WMIS).

The forecast of municipal waste production was developed by a mathematical<sup>6</sup> model. The model was used to forecast production of the following *waste streams* in the period 2013-2024:

- *municipal waste,*
- *mixed municipal waste,*
- *biodegradable municipal waste*
- *materially recoverable components of municipal waste,*
- *hazardous components of municipal waste.*

The term *waste stream* is used for a set of waste similar to each other in their physical and chemical parameters or in origin. For the purposes of the model calculation, the production

<sup>6</sup> The model is based on a model for the analysis of municipal waste production, which was an output from a project funded by the Ministry of Environment "Analysis of cost and price relationships in waste management in the Czech Republic "(prof. RNDr. Jiří Hřebíček, PhD., et al. 2009).

of the individual waste streams is defined as the weighted averages of production of waste types, according to the Waste Catalogue.

The model consists of three sub-models using different methods of modelling time-series production of individual waste streams given by exactly defined weighted sums of waste types according to the Waste Catalogue. The primary output of the model for each waste stream is three scenarios which are used to develop the most likely variant of developments of production.

*Submodel I* works on the principle of *linear regression* of production distributed in the individual municipalities and in the resulting average it has a weight of 0.25.

*Submodel II* uses the fitting of *exponential trends to the nationwide aggregated data* and in the resulting average it also has a weight of 0.25.

*Submodel III* consists of an *expert multidimensional linear model* for municipalities, the result is influenced by the weight of 0.5.

*Submodel IV* consists of a modified *submodel III* for non-municipality entities, the result is influenced by the weight of 0.5.

## Production forecasts of municipal waste in the Czech Republic in the period 2014-2024

Data for the years 2008 - 2011 were generated from WMIS (recalculated database WMIS). The calculation of the production of individual waste codes was managed by the methodology of "Mathematical representation of calculation of the system of waste management indicators" For 2008, a "backwards" recalculated database was used; therefore the values for 2008 cannot be compared with previously published official data of MoE.

<b>Table 11: Aggregation of waste types into waste streams</b>	
<b>Title of waste stream per model specification</b>	<b>Aggregated types of waste – Catalogue Number.</b>
Municipal waste	15 01 01, 15 01 02, 15 01 03, 15 01 04, 15 01 05, 15 01 06, 15 01 07, 15 01 09, 15 01 10, 15 01 11, 20 01 01, 20 01 02, 20 01 08, 20 01 10, 20 01 11, 20 01 13, 20 01 14, 20 01 15, 20 01 17, 20 01 19, 20 01 21, 20 01 23, 20 01 25, 20 01 26, 20 01 27, 20 01 28, 20 01 29, 20 01 30, 20 01 31, 20 01 32, 20 01 33, 20 01 34, 20 01 35, 20 01 36, 20 01 37, 20 01 38, 20 01 39, 20 01 40, 20 01 41, 20 01 99, 20 02 01, 20 02 02, 20 02 03, 20 03 01, 20 03 02, 20 03 03, 20 03 06, 20 03 07, 20 03 99
Mixed municipal waste	20 03 01
Biodegradable municipal waste	15 01 01 <sup>a</sup> , 20 01 01, 20 01 08, 20 01 10, 20 01 11, 20 01 38, 20 02 01, 20 03 01, 20 03 02, 20 03 03, 20 03 07
Materially recoverable components of municipal waste	15 01 01, 15 01 02, 15 01 04, 15 01 05, 15 01 07, 15 01 09, 20 01 01, 20 01 02, 20 01 39, 20 01 40, 20 01 10, 20 01 11, 20 03 01
Hazardous components of municipal waste	20 01 13, 20 01 14, 20 01 15, 20 01 17, 20 01 19, 20 01 21, 20 01 23, 20 01 26, 20 01 27, 20 01 29, 20 01 31, 20 01 33, 20 01 35, 20 01 37

Legend: <sup>a</sup> Waste catalogue no. 150101 from municipalities

### **Biodegradable municipal waste (BDMW)**

In accordance with the methodology of calculation of the indicator I.22 (indicator system WMP CR 2013 - coefficients for the year 2001) coefficients were chosen according to the assignment of MoE. The coefficients for weight aggregation of biologically degradable municipal waste are provided in Table no. 8. This means that aggregation is not a simple sum, but a weighted sum of individual types of waste with coefficients from Table no. 8.

### **Materially recoverable components of municipal waste**

In the case of materially recoverable waste (MRW), the aggregation is also the weighted sum of individual types of waste from Table no. 9.

As materially recoverable components of municipal waste are considered those waste types where a separate collection method may be practically provided, with their subsequent processing into a raw material ("secondary raw material") and the processing of these raw materials in the production processes. The recoverable groups of municipal waste include waste types listed in Table no. 9, i.e. Waste Catalogue no. 20 01 01, 20 01 02, 20 01 39, 20 01 40, and for limited recovery waste types no. 20 01 10 and 20 01 11 may also be considered. A part of municipal waste is also used packaging, specifically Waste Catalogue no. 15 01 01, 15 01 02, 15 01 04, 15 01 05, 15 01 07 and 15 01 09 in Table no. 9.

Also is included is the share of materially recoverable waste in mixed municipal waste.

Additionally, it is considered that part of the materially recoverable waste not recoverable.

From the materially recoverable waste in municipal waste and mixed municipal waste is subtracted the proportion of material unsuitable for material recovery (recycling).

Due to the fact that the concept of materially recoverable waste is not clearly defined in the legislation, in cooperation with MoE four variants were drawn up for predicting materially recoverable waste in municipal waste, where different coefficients in the aggregation of individual types of materially recoverable waste were used.

The variant MRW4 - includes materially recoverable types of municipal waste from group 20 and subgroups 20 15 01 from separately collected waste in municipalities and the share of materially recoverable components in mixed municipal waste. The coefficients for each type of municipal waste, which were reduced as a result of contamination or improper design of the products, were provided by MoE.

## 2.4.1 Forecast final output data

### 2.4.1.1 Municipal waste

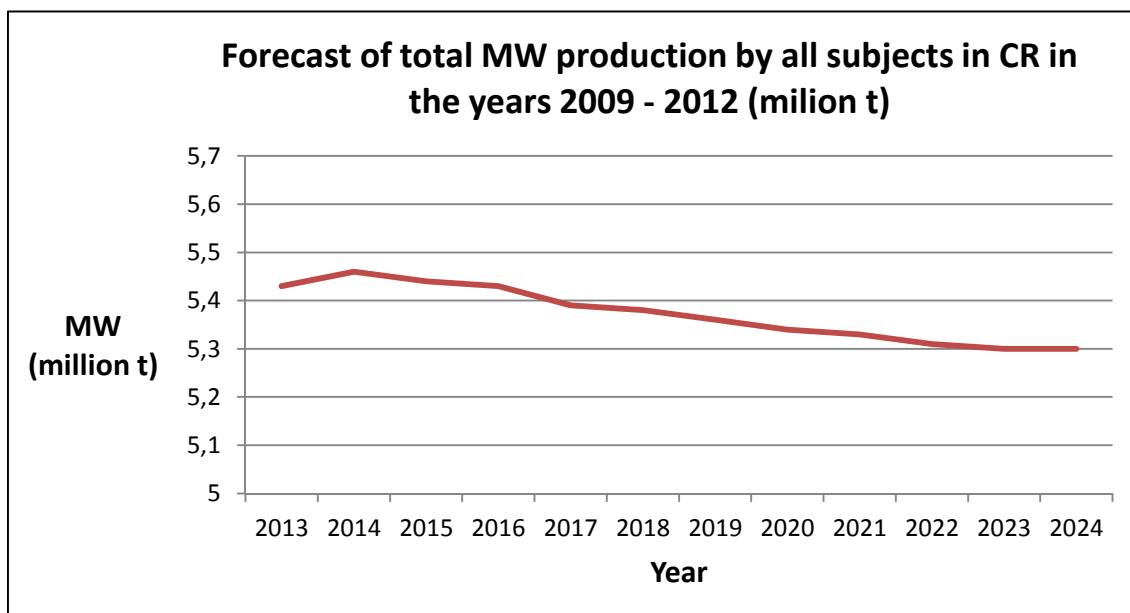
#### Municipal waste production forecast

(from all subjects)

Total municipal waste production in Table no. 12 corresponds approximately to the constant trend in the production of municipal waste in municipalities and shows only a slight decrease in the production of municipal waste by about 2.3% in 2024, relative to municipal waste production in 2013. Between the years 2013 and 2014, the production of municipal waste will grow slightly, but by 2015 the production of municipal waste will decline by approximately 0.18% per annum, see Table no. 12 and Figure 7.

Table 12: Forecast of total production of municipal waste by all subjects in the Czech Republic (million tons)												
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total	5.43	5.46	5.44	5.43	5.39	5.38	5.36	5.34	5.33	5.31	5.30	5.30
Municipalities	3.93	3.97	3.97	3.97	3.94	3.94	3.94	3.94	3.94	3.93	3.93	3.94
Non-municipal entities	1.50	1.49	1.47	1.46	1.45	1.43	1.42	1.41	1.39	1.38	1.37	1.36

Figure 7: Forecast of total production of municipal waste by all subjects in the Czech Republic in the period 2013 – 2024.



## 2.4.1.2 Mixed municipal waste

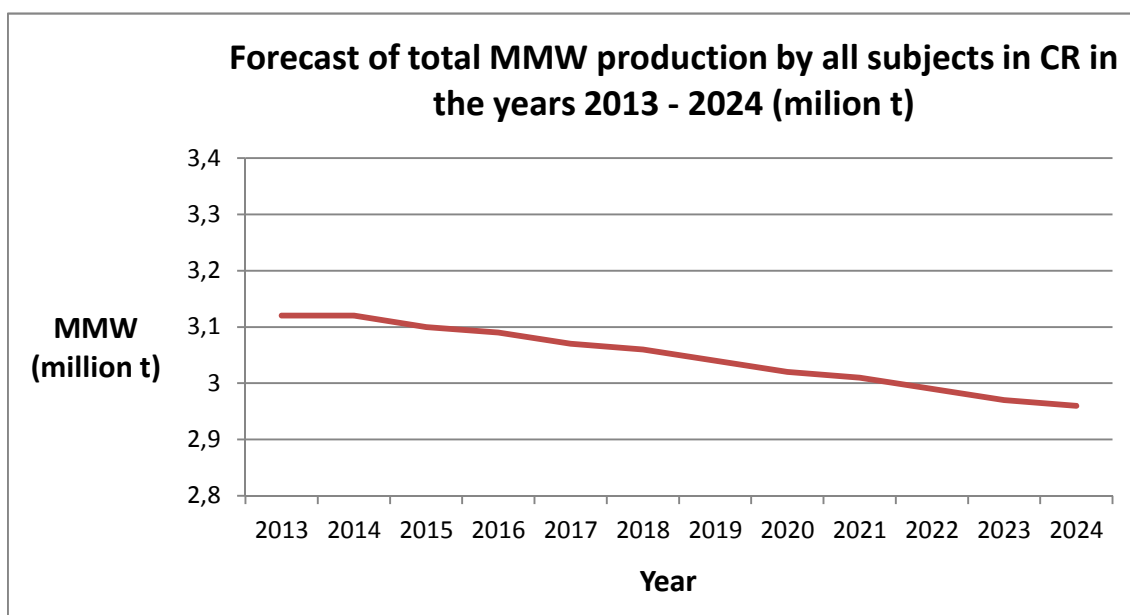
### Forecast of mixed municipal waste production

(from all subjects)

Total production of mixed municipal waste in Table no. 13 displays a slightly decreasing trend, influenced primarily by the decrease in the production of mixed municipal waste in communities, while the production from non-municipal mixed municipal waste entities will be approximately constant. By the year 2024 a decline in production of mixed municipal waste may be expected, by about 5.1% in comparison with the year 2013, which translates into a linear decrease in mixed municipal waste of 0.4% annually until 2024. This is in line with the current trends of mixed municipal waste production and prevention approaches being prepared (Waste prevention programme, etc...)

Table 13: Forecast of total MMW production by all subjects in the Czech Republic (million tons)												
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total	3.12	3.12	3.10	3.09	3.07	3.06	3.04	3.02	3.01	2.99	2.97	2.96
Municipalities	2.22	2.22	2.21	2.19	2.17	2.16	2.14	2.12	2.11	2.10	2.08	2.06
Non-municipal entities	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90

Figure 8: Forecast of total production of mixed municipal waste by all subjects in the Czech Republic in the period 2013 – 2024.



### 2.4.1.3 Biodegradable municipal waste Forecast of biodegradable municipal waste production

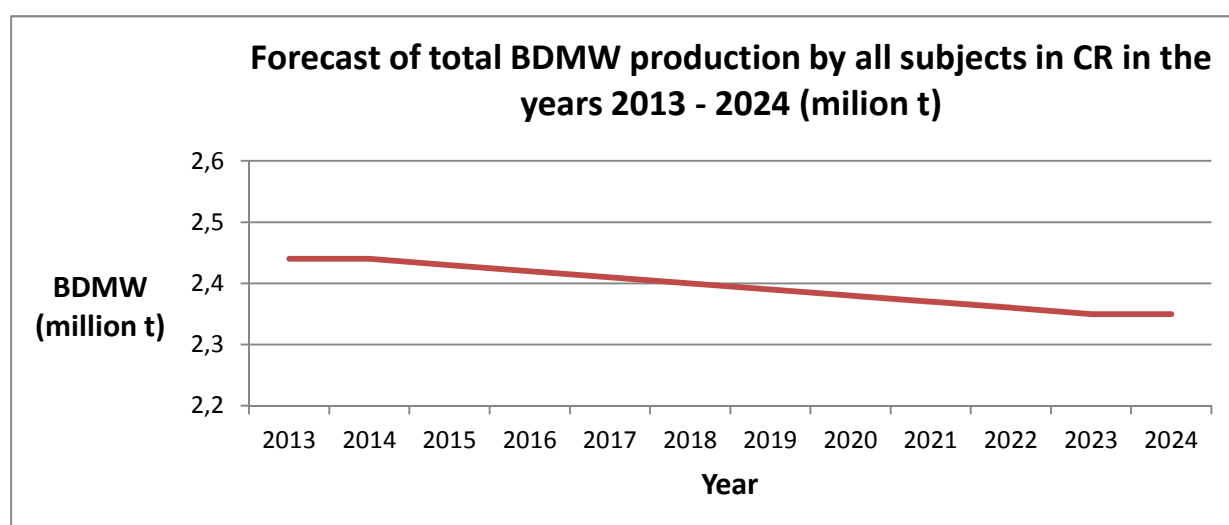
(from all subjects)

Biodegradable municipal waste displays an overall decreasing trend, which corresponds to the prediction of municipalities and non-municipal entities, which reflects the likely effects of current restraining measures of waste prevention (e.g. community composting), which lead to the reduction of biodegradable municipal waste in municipal waste. It also corresponds to the fact that the production of biodegradable municipal waste will continue to be, in the coming years, strongly influenced additional in prevention measures (e.g. the Programme of waste prevention.)

Table 14: Forecast of BDMW production by all subjects in the Czech Republic (mil. t)												
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Total</b>	<b>2.44</b>	<b>2.44</b>	<b>2.43</b>	<b>2.42</b>	<b>2.41</b>	<b>2.40</b>	<b>2.39</b>	<b>2.38</b>	<b>2.37</b>	<b>2.36</b>	<b>2.35</b>	<b>2.35</b>
Municipalities	1.70	1.71	1.71	1.70	1.70	1.70	1.70	1.69	1.69	1.69	1.68	1.70
Non-municipal entities	0.74	0.73	0.72	0.72	0.71	0.70	0.69	0.69	0.68	0.67	0.67	0.66

The total production of biodegradable municipal waste in Table no. 14 corresponds approximately with the downward trend in the production of biodegradable municipal waste of municipalities and displays only a slight decline in the production of biodegradable municipal waste of about 3% in 2024 relative to the production in 2011. Between 2013 and 2014, the production of biodegradable municipal waste will be approximately constant, but by 2015 the production will decline approximately by 0.25% per year, see Table no. 14 and Figure no. 9.

Figure 9: Forecast of BDMW production by all subjects in the Czech Republic for the period 2013 - 2024.



## 2.4.1.4 Materially recoverable components of municipal waste

### Forecasts production of materially recoverable components of municipal waste (from all subjects)

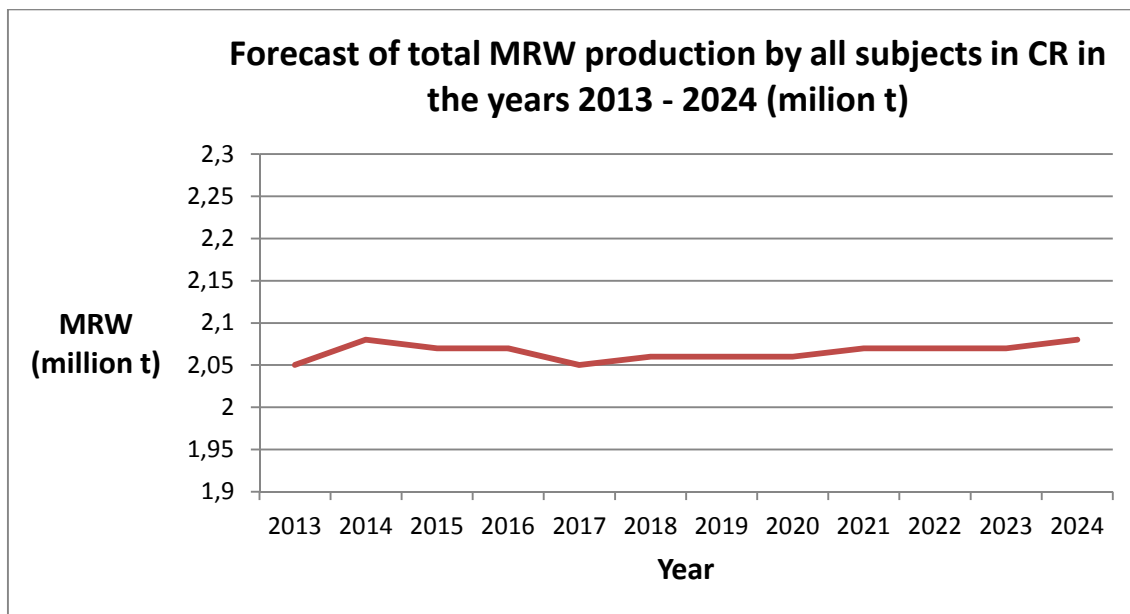
#### Materially recoverable components of municipal waste - Variant 4 (MRW 4)

This variant is based on the coefficients for calculating the materially recoverable waste as provided by the Ministry of Environment.

The variant is influenced by the weight of the significant share of materially recoverable waste coming from mixed municipal waste, whose production declines in municipalities by the year 2024. The result is therefore approximately a statistically insignificant increase of production materially recoverable waste by about 1.8 % in 2024 relative to 2013 (about 0.15% per year) without large fluctuations until 2024, see Figure no. 10.

Table 15: Forecast of MRW total production - Variant 4 from all subjects in the Czech Republic (mil. t)												
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total	2.05	2.08	2.07	2.07	2.05	2.06	2.06	2.06	2.07	2.07	2.07	2.08
Municipalities	1.58	1.62	1.62	1.62	1.63	1.63	1.63	1.63	1.65	1.65	1.65	1.66
Non-municipal entities	0.47	0.46	0.45	0.45	0.44	0.43	0.43	0.43	0.42	0.42	0.42	0.42

Figure 10: Forecast of materially recoverable waste total production by all subjects in the Czech Republic for the period 2013 - 2024.



## 2.4.1.5 Hazardous components of municipal waste

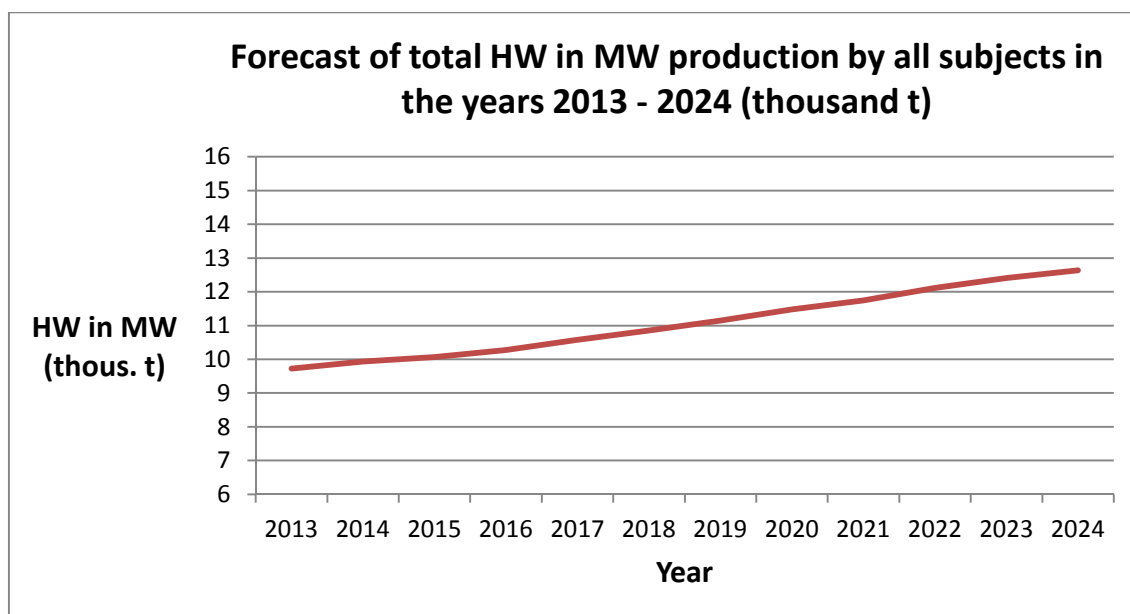
### Forecast of the production of hazardous waste (HW) components in municipal waste

(from all subjects)

Due to the distortion in the case of hazardous components of municipal waste from non-municipality producers, also the model of the total amount of hazardous components in municipal waste is distorted and the result is burdened by a high error (uncertainty). In general, hazardous components in municipal waste until the year 2024 display a rising trend driven also mainly by production of hazardous components in municipal waste in communities, where it is possible to expect an increase of about 30% in 2024 relative to the year 2013, i.e. approximately 2.5% per annum between 2013 and 2024. However, in view of the total share of hazardous components in total municipal waste (<0.23%), this growth is not significant.

Table 16: Forecast of total production of hazardous components in MW (thousand tons)												
Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Total</b>	<b>9.72</b>	<b>9.93</b>	<b>10.07</b>	<b>10.27</b>	<b>10.58</b>	<b>10.85</b>	<b>11.15</b>	<b>11.48</b>	<b>11.74</b>	<b>12.11</b>	<b>12.41</b>	<b>12.64</b>
Municipalities	7.45	7.82	8.07	8.35	8.72	9.02	9.34	9.68	9.94	10.31	10.60	10.81
Non-municipal entities	2.27	2.11	2.00	1.92	1.86	1.83	1.81	1.80	1.80	1.80	1.81	1.83

Figure 11: Forecast of production of hazardous components in municipal waste from all subjects in the Czech Republic for the period 2013 – 2024





## 2.5 Forecast of municipal waste management development in CR until 2014

The Ministry of Environment commissioned the Masaryk University (MU) in Brno<sup>7</sup> [1] to draw up the forecast of municipal waste production in the Czech Republic for the period of 10 years (until the year 2024) in accordance with the hierarchy of waste management and in relation to the forecasted production of waste, in accordance with the current overall state of waste management in the Czech Republic, the current state of waste management and network of waste management facilities in the Czech Republic, requirements of European regulations, preferred technologies and proposed objectives in WMP CR, as well as taking into account environmental and economic perspectives.

The protection of the environment and human health is related to the prevention of adverse effects (or reducing the adverse effects) of waste, including *municipal waste* and its management, reduction of the overall impact of resource use and increasing the efficiency of such use when applying the following hierarchy for waste management stemming from the Framework Waste Directive: *prevention, preparation for re-use, recycling, other recovery, disposal*.

In the Czech Republic, a considerable potential for improvement exists in the management of municipal waste. The objectives of WMP CR for the period 2015-2024 are: better utilization of resources, opening of new markets, creating new jobs in waste management, and reducing dependence on imports of raw materials that can be re-used from the separate collection of recyclable components of municipal waste, while limiting the impacts on the environment.

This forecast of municipal waste management in the Czech Republic for the ten year period (until the year 2024) should contribute to the assessment of the possibilities of the Czech Republic both to fulfilling the objectives of the 7th Action Programme of for the Environment EU (Decision no. 1386/2013/EU) in the area of waste management and the requirements arising from the EU and Czech Republic waste legislation, in order to maximize the contribution of EU the legislation on the basis of their better implementation.

The forecasts were processed using data from the Waste Management Information System (WMIS). The forecast for municipal waste management is based on the results of municipal waste production until 2024 (see chapter 2.4) and uses input data from WMIS on the management of municipal waste in municipalities in the period 2009-2012. Additionally, the database of facilities for waste management was also used. Also more precise information about the facilities was cooperatively provided by the regional authorities, who provided

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<sup>7</sup> The Report „Forecast of municipal waste production and management in the Czech Republic in the period 2013 - 2024“ was prepared on the basis of a contract between the Ministry of Environment and the Institute of Biostatistics and Analyses, Masaryk University, concluded in 2013.

data on the effectively operating facilities, which constitute the network of facilities for waste management in the Czech Republic.

## 2.5.1 Potential of municipal waste management with respect to its composition

According to the methodology, "Mathematical representation of calculation of the system of waste management indicators", the methods of waste management may be divided in particular:

- **MRW: material recovery of municipal waste** (regeneration, recycling, etc.), see the respective codes in Table no. 17;
- **WER: energy recovery from municipal waste** (utilization of waste principally as a fuel or other means to generate energy) code R1;
- **Landfilling: disposal of municipal waste by landfilling and other deposition** (landfilling of waste), see the appropriate codes in Table no. 17;
- **Incineration: disposal of municipal waste by incineration** (waste incineration on land) code D10.

For the purpose of forecasting the methods of waste disposal were additionally supplemented by:

- **Composting: composting** (which includes aerobic and anaerobic utilization of biodegradable waste) codes N13 and R3 in the management of biodegradable waste;
- **Other: other disposal** (which includes the remaining codes for disposal)

Table 17: List of selected waste management methods	
Management code	Waste management method
<b>Energy recovery from waste (WER)</b>	
R1	Use of waste principally as a fuel or other means to generate energy
<b>Material recovery of waste (MRW)</b>	
R2	Recovery/regeneration of solvents
R3	Recycling/ recovery of organic substances which are not used as solvents (including biological processes excluding composting and biological decontamination)
R4	Recycling / recovery of metals and metal compounds
R5	Recycling / recovery of other inorganic materials
R6	Regeneration of acids and bases
R7	Recovery of components used for pollution abatement
R8	Recovery of components from catalysers
R9	Refining of spent oil or other ways to re-use oil
R10	Application to soil resulting in benefit to agriculture or improvement of ecology
R11	Recovery of waste generated under the designation R1 to R10

<b>Table 17: List of selected waste management methods</b>	
<b>Management code</b>	<b>Waste management method</b>
R12	Pre-treatment of waste for the application of any of the procedures listed under R1 to R11
N1	Recovery of waste for landscaping, etc.
N2	Transferring WWTP sludge for use on agricultural land
N8	Forwarding (parts, waste) for re-use
N10	Sale of waste as raw material ("secondary raw materials")
N11	Waste recovery for landfill reclamation
N12	Deposition of waste as construction material to secure a landfill
N13	Composting
N15	Tyre retreading
<b>Disposal of waste in landfills and other deposition</b>	
D1	Store at or below ground level (landfilling)
D3	Deep injection (e.g. injection of pumpable liquid waste into wells, salt caverns or naturally occurring open spaces, etc.)
D4	Deposition into surface impoundment (e.g. discharge of liquid or sludge waste into pits, ponds, lagoons, etc.).
D5	Deposition into surface impoundment (e.g. the discharge of liquid or sludge waste into pits, ponds, lagoons, etc.).
D12	Final or permanent deposition (e.g. the storage containers in a mine)
<b>Disposal of waste by incineration</b>	
D10	Incineration on land

### 2.5.1.1 Municipal waste management in the years 2009 - 2012

Tables 18 and 19 summarize data (weight and percentage related to waste management) on the management of municipal waste in the years 2009 – 2012. The data relate to the material (MRW) and energy (WER) recovery, composting, and disposal by landfilling, incineration and other disposal in the individual surveyed waste streams (i.e. a total MW, MMW, BDMW, MRW4 and HW in MW). The input data on the management of municipal waste was obtained from the database WMIS for municipalities and non-municipal subjects. Other disposal methods, however, are not included for all streams in Tables 18 and 19, they are omitted in waste streams which are insignificant in relation to other forms of management. However, they were included for the waste stream total MW, as it provides an idea of the overall situation in MW waste management. Composting is also not provided for all streams in Tables 18 and 19, it is provided only for the stream BDMW.

**Table 18: Waste stream management: MW total, MMW, BDMW MRW4, and HW in MW in the years 2009 - 2012 (t)**

Waste stream	Type of management	2009	2010	2011	2012
<b>Total MW</b>	<b>MRW</b>	1 687 741	1 712 451	2 059 706	1 906 312
	<b>Composting</b>	188 590	205 779	257 884	225 796
	<b>WER</b>	335 347	492 447	602 577	632 182
	<b>Landfilling</b>	3 568 924	3 328 152	3 106 510	2 885 571
	<b>Incineration</b>	790 111	1809	807	540
	<b>Other disposal</b>	27 064	28 753	29 244	35 663
<b>MMW</b>	<b>MRW</b>	17 352	30 500	48 333	65 856
	<b>Composting</b>	0	0	0	0
	<b>WER</b>	292 229	436 198	541 286	572 606
	<b>Landfilling</b>	2 756 828	2 580 278	2 420 432	2 285 662
	<b>Incineration</b>	101	185	130	168
	<b>Other disposal</b>	0	0	0	0
<b>BDMW</b>	<b>MRW</b>	858 662	759 988	848 314	842 206
	<b>Composting</b>	188 590	205 779	257 884	225 796
	<b>WER</b>	165 662	240 963	292 677	307 708
	<b>Landfilling</b>	1 510 808	1 408 112	1 324 913	1 241 984
	<b>Incineration</b>	895	935	792	537
	<b>Other disposal</b>	8 266	15 269	18 234	22 192
<b>MRW4</b>	<b>MRW</b>	1 305 519	1 312 316	1 627 096	1 472 863
	<b>Composting</b>	0	0	0	0
	<b>WER</b>	102 951	147 715	180 369	189 319
	<b>Landfilling</b>	872 679	817 144	766 602	722 181
	<b>Incineration</b>	1 195	1 118	1 175	895
	<b>Other disposal</b>	0	0	0	0
<b>HW in MW</b>	<b>MRW</b>	8930	5291	7103	4335
	<b>Composting</b>	0	0	0	0
	<b>WER</b>	536	219	222	453
	<b>Landfilling</b>	1 420	950	554	327
	<b>Incineration</b>	1 266	1 468	1 679	1 606
	<b>Other disposal</b>	0	0	0	0

Source: Ministry of the Environment, WMIS  
Recalculated database WMIS (2009-2012)

**Table 19: Treatment of waste streams: MW total, MMW, BDMW MRW4 and HW in MW in 2009 - 2012 (%) relative to the total weight of the stream**

Waste stream	Type of management	2009	2010	2011	2012
<b>Total MW</b>	<b>MRW</b>	29.05%	29.68%	34.00%	33.52%
	Composting	3.25%	3.57%	4.26%	3.97%
	WER	5.77%	8.54%	9.95%	11.12%
	Landfilling	61.43%	57.69%	51.28%	50.74%
	Incineration	0.03%	0.03%	0.03%	0.03%
	Other	0.47%	0.50%	0.48%	0.63%
<b>MMW</b>	<b>MRW</b>	0.57%	1.00%	1.61%	2.25%
	Composting	0.00%	0.00%	0.00%	0.00%
	WER	9.53%	14.31%	17.98%	19.58%
	Landfilling	89.90%	84.68%	80.41%	78.16%
	Incineration	0.00%	0.01%	0.00%	0.01%
	Other	0.00%	0.00%	0.00%	0.00%
<b>BDMW</b>	<b>MRW</b>	31.64%	29.05%	31.33%	32.00%
	Composting	6.24%	7.31%	8.23%	8.25%
	WER	6.10%	9.21%	10.81%	11.69%
	Landfilling	55.68%	53.82%	48.93%	47.19%
	Incineration	0.03%	0.04%	0.03%	0.02%
	Other	0.30%	0.58%	0.67%	0.84%
<b>4 MRW</b>	<b>MRW</b>	57.20%	57.60%	63.18%	61.75%
	Composting	0.00%	0.00%	0.00%	0.00%
	WER	4.51%	6.48%	7.00%	7.94%
	Landfilling	38.24%	35.87%	29.77%	30.28%
	Incineration	0.05%	0.05%	0.05%	0.04%
	Other	0.00%	0.00%	0.00%	0.00%
<b>HW in MW</b>	<b>MRW</b>	73.49%	66.74%	74.31%	64.50%
	Composting	0.00%	0.00%	0.00%	0.00%
	WER	4.41%	2.76%	2.32%	6.74%
	Landfilling	11.69%	11.98%	5.80%	4.87%
	Incineration	10.42%	18.52%	17.57%	23.90%
	Other	0.00%	0.00%	0.00%	0.00%

Source: Ministry of the Environment, WMIS  
Recalculated database WMIS (2009 - 2012)

The values provided in Table 19 may in some cases vary slightly from the results published earlier by MoE. Deviations within tenths to several percent may be caused by different versions of the database WMIS on which the calculations were performed, as well as a slightly different classification of waste management e.g. for example composting and material recovery is usually part of the flow of material recovery, and others.

### 2.5.1.2 Analysis of municipal waste composition in 2012

Table 20 summarizes data from the production of single waste types in municipal waste, calculated from the recalculated database WMIS for municipalities and non-municipality subjects in 2012, including the percentage share in the total amount of 5 192 784 tons of

MW produced in 2012. It also shows the share in the total quantity of MW, how each waste type is included in waste streams in BDMW, MRW1 to MRW4.

**Table 20: Production of various types of waste types in MW, obtained from the recalculated database WMIS for municipalities and non-municipality subjects in 2012 and coefficients of how the different types of waste are included in waste streams BDMW and MRW4**

Cat. No.	Type of waste	Production [t]	Share of MW	BDMW	MRW4
<b>20 03 01</b>	<b>Mixed municipal waste</b>	<b>2 932 787</b>	<b>56.5%</b>	0.48	0.309
20 03 07	Bulk waste	476 859	9.2%	0.3	0
20 01 40	Metals	436 160	8.4%	0	0.98
20 01 01	Paper and cardboard	376 788	7.3%	1	0.98
20 02 01	Biodegradable waste (from gardens and parks)	275 962	5.3%	1	0
15 01 01	Paper and cardboard packaging	93 824	1.8%	1	0.98
20 03 03	Street sweepings	89 518	1.7%	0.1	0
20 01 02	Glass	81 090	1.6%	0	0.977
20 01 39	Plastics	74 233	1.4%	0	0.808
15 0107	Glass packaging	40 911	0.8%	0	0.977
15 01 02	Plastic packaging	40 285	0.8%	0	0.808
20 01 38	Wood other than catalogue no. 20 01 37	37 222	0.7%	1	0
20 01 08	Biodegradable waste from kitchens and canteens	22 894	0.4%	1	0
20 03 02	Waste from marketplaces	9671	0.2%	0.75	0
20 01 11	Textile materials	5121	0.1%	0.75	0.5
20 01 10	Garments	4749	0.1%	0.75	0.5
15 01 05	Composite packaging	2864	0.1%	0	0.98
15 01 04	Metal packaging	1215	0.0%	0	0.98
15 01 09	Textile packaging	1267	0.0%	0	0.5
<b>Total</b>		<b>5 003 421</b>	<b>96.4%</b>	<b>2 381 093</b>	<b>2 016 160</b>
	<b>Total MW</b>	<b>5 192784</b>	<b>Share in MW</b>	<b>45.9%</b>	<b>38.9%</b>

Source: Ministry of the Environment, WMIS  
Recalculated database WMIS (2009 - 2012)

In the provided data on MW waste management, all of the management codes and the respective quantities were generated from information from all entities that submitted reports on production and management in the given region regardless of their type (i.e. from entities such as a company, firm without identification number, municipality). The quantity of waste managed, by management codes, was listed as the sum of waste for each region

without resolution of the specific entities (registered entities). Therefore, the sums of total production of the single waste types in group 20 and subgroup 15 01 and in individual monitored streams MW, MMW, BDMW MRW4 and HW in MW created in *production forecasts of MW* do not exactly coincide with the values obtained by the summing up of total production obtained from the data received from municipalities on the management of MW in the *MW waste forecast*. These data totals on waste management were between 5% and 10% higher than the totals of the received data on production. This error should be taken into account when comparing the results of *MW waste management forecast* and *MW production forecasts*.

Figure 17 shows the composition of MW in 2012, based on data from Table 20.

Figure 17: Composition of MW in 2012 - individual waste type components

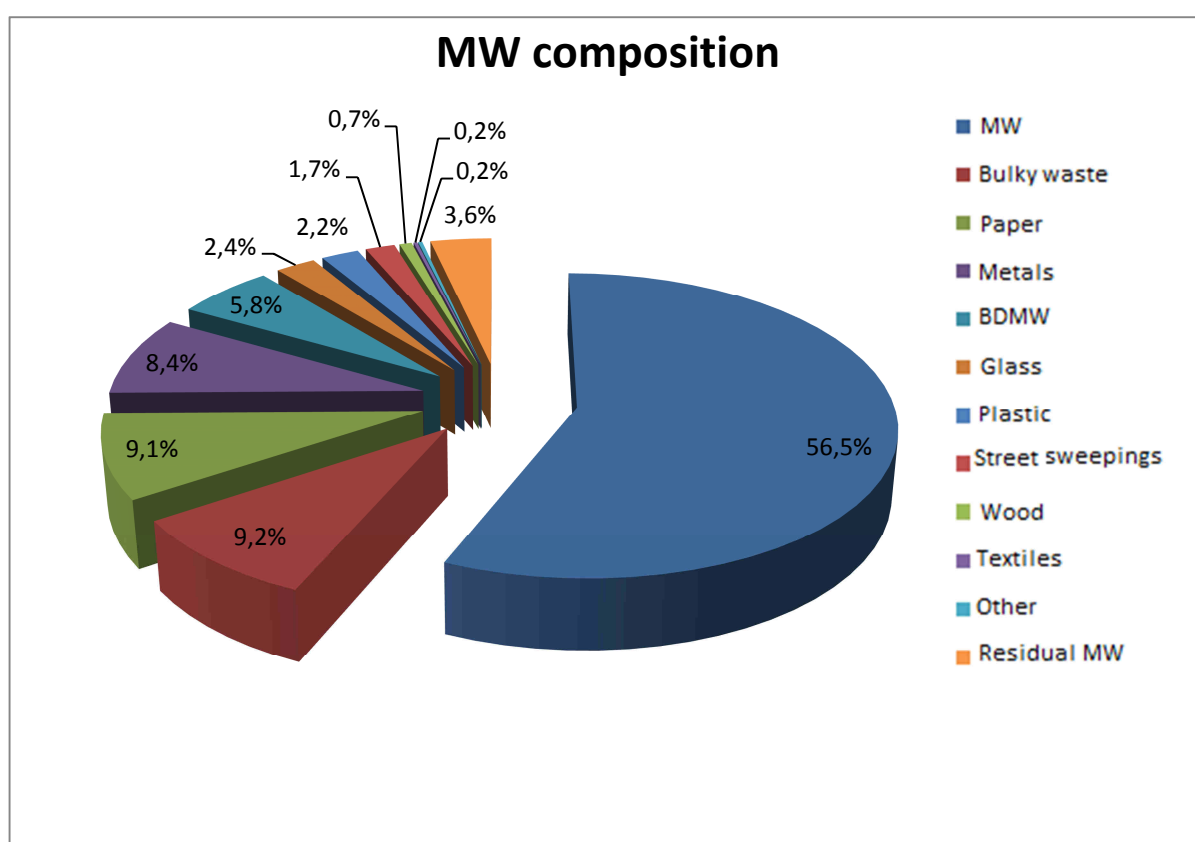
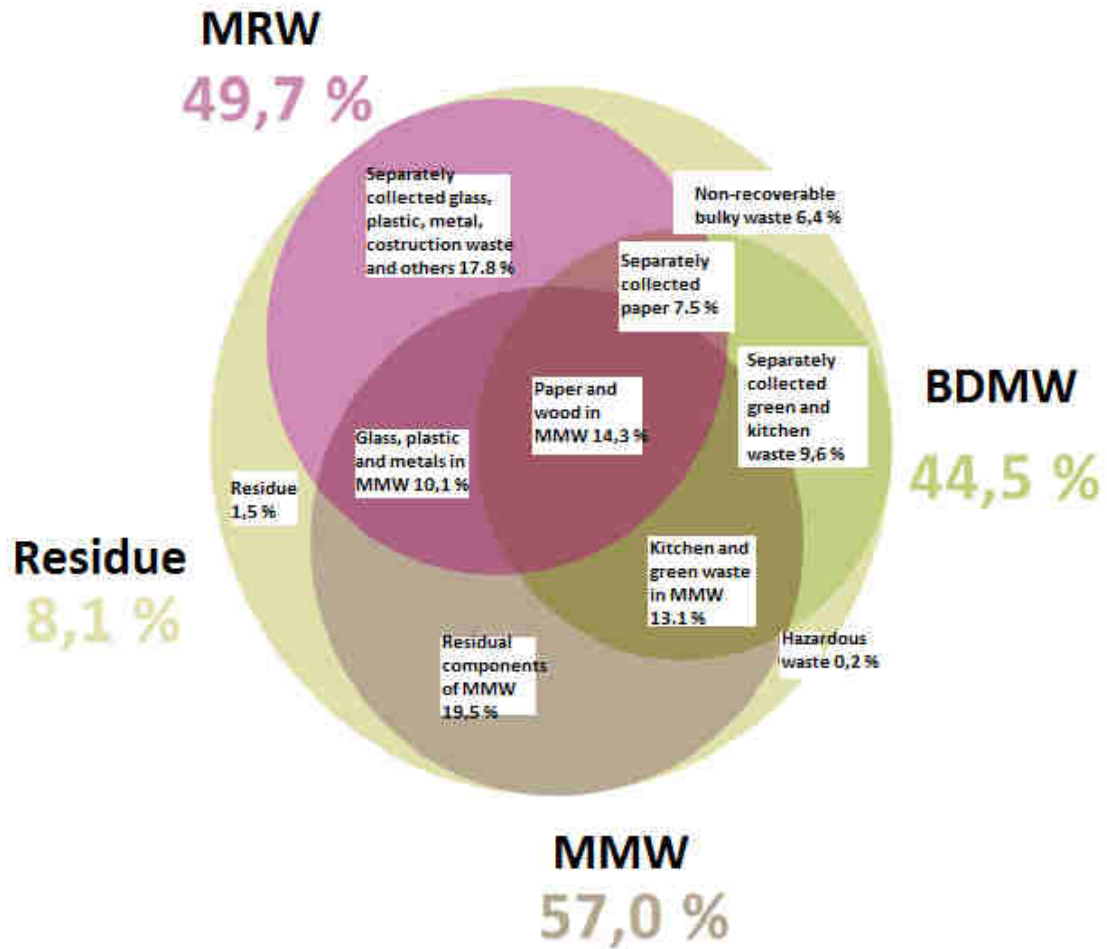


Figure 18 shows the distribution of municipal waste production in 2012 by waste sub-streams shown on Figure 17.

MW represents in Figure 18 the whole gray green circle, and individual MRW waste streams (purple circle), MMW (gray circle), and BDMW (green circle) intersect each other in the common individual types of waste in MW. Figure 18 shows for illustration the indicative shares of waste sub-streams, in percent, discussed below.

Figure 18: MW composition in 2012 - waste streams MRW, BDMW, and MMW



In the *purple circle* MRW showing the quantity of potentially recoverable waste material are provided, in % the single species of separately collected materially recoverable waste from MW, and this circle is blended with the *gray circle* MMW, where the separable materially recoverable components from MMW are considered, based on the model MRW4, and overlap with *green circle* BDMW, where they have in common separately collected paper and wood separable from MMW. The gray circle of MMW provides in % the potentially separable individual species of recyclable waste and unrecoverable residual components of MMW. The green circle BDMW provides % of individual species of biodegradable municipal waste. These three waste streams MRW, MMW and BDMW overlap each other in the waste paper separable from MMW.

All three waste streams MRW, MMW, and BDMW are contained in the gray green circle, which represents the overall composition of MW included in streams MMW, MRW, and BDMW and it also includes the *residual MW*, which represents unrecoverable bulky waste,



residual fraction (street sweepings, biodegradable and non-recoverable material component of MMW etc.) and hazardous components HW in MW.

Figure 18 shows the distribution of MW production into streams of MRW, MMW and BDMW and then their sub-streams displayed above.

## 2.5.2 Initial assumptions for waste management forecast

The waste management model for municipal waste was created in accordance with the structure of model production for **five aggregated waste streams**:

- **MW** -total municipal waste
- **MMW** - mixed municipal waste
- **BDMW** – biodegradable municipal waste
- **MRW** - material recoverable components of municipal waste (MRW4)
- **HW in MW** - hazardous waste components in municipal waste

and **five types of waste management**:

- **MR** - material recovery
- **ER** - energy recovery
- **Composting** - composting and anaerobic digestion
- **Landfilling** - disposal to landfills and other deposition
- **Incineration** – disposal by incineration and Others – other disposal

as a complex **system of seventy-six general nonlinear equations**, which **describe in detail the relationship between the single waste streams and sub-streams** managed by one of the listed methods.

### 2.5.2.1 Breakdown of municipal waste streams into sub-streams

Already from the MW production model for the production forecast it is obvious that the considered individual waste streams are not disjoint, see Figure 18. This property is evident already from the fact that one of the streams is the total *municipal waste* (MW), which includes all other sub-streams. Intersections are also obvious amongst the *mixed municipal waste* (MMW), *biodegradable municipal waste* (BDMW) and *materially recoverable components of municipal waste* (MRW). Specifically, the MW management model includes waste paper, which belongs to the intersection of MMW, BDMW and also MRW; part of kitchen and garden waste, which belongs to the intersection of MMW and BDMW; separately collected wood and paper, which belongs to the intersection BDMW and MRW, and glass, plastic, beverage cartons and metals in MMW as a common component of total production MMW and also MRW (see Figure 18). In addition, MW components also

separately modelled are the *hazardous components of MW* (HW in MW), i.e. set, which has non-empty intersection with all the previously mentioned streams.

The simple sum of individual production waste streams MMW, MRW and BDMW (or HW in MW) thus returns quantity significantly exceeding the total forecasted production of MW and to obtain accurate results of management of MW, MMW, MRW and BDMW (possibly HW in MW), it is required to use the set principle of inclusion-exclusion, which requires the determination of the size of the intersection of individual streams. To describe the changing relationships among the five streams, wherever appropriate, waste sub-streams were introduced based on catalogue numbers (c.n.) of the Waste Catalogue group 20 and subgroup 15 01, allowing the description of the relationship among the streams as set intersections or differences of the above listed five streams.

In the created model for forecasting MW waste management, the following *waste sub-streams* are introduced (code used for naming the model variables<sup>8</sup> is provided in parentheses), see Figure 18:

1. Total municipal waste (*ko*)\*
2. Separately collected waste materially recoverable with the exception of paper (*mvo*)
3. Separately collected BDMW with the exception of paper (*brko*),
4. Residual (non-recoverable) MMW (*sko*),
5. Separately collected paper and wood (*brkomvo*),
6. Part of kitchen and garden waste (*brkosko*),
7. Glass, plastic, metal and cardboard in MMW (*mvosko*)
8. Paper in MMW (*brkomvosko*),
9. Residue (*zbytek*),
10. Hazardous components in municipal waste (*no*).\*

Sub-streams were selected so that with the exception of sub-streams marked with an asterisk (list above), their sum was equal to the total production of municipal waste:

$$ko = mvo + brko + sko + brkomvo + brkosko + mvosko + brkomvosko + zbytek \quad (1)$$

The sub-streams marked with an asterisk (i.e. HW in MW and total MW) are not included in the total because they have a non-empty intersection with the individual summands. In the case of HW in MW, the addends in (1) could be split in pairs of sub-streams, i.e. sub-streams with and without hazardous properties, and thus obtain a total of 16 sub-streams, however the classification into hazardous and other waste is independent of those sub-streams and therefore this procedure would not bring any advantage, while doubling the number of

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<sup>8</sup> These codes are written deliberately in small italics, to avoid confusion of the code with the abbreviation generally written in capital letters, because the variable definition does not match the definition of the term as described above and as is commonly used. E.g. the variable *sko* does not contain all mixed municipal waste, but only its residual part, etc. In addition, we are talking about waste codes and not variables, because these waste codes will be hereinafter used to introduce different variables corresponding to the different types of management of the given waste sub-stream.

model equations. Furthermore, the quantity of HW in MW is very small (0.0075%) compared to the total quantity of MW, therefore HW in MW were therefore modelled separately in a simpler manner by extrapolation existing trends.

### 2.5.2.2 Diversion of mixed municipal waste components

Another complication in the model was to create equations for the description of MMW as the sum of the residual part (and therefore inseparable and useless) of MMW and the derivable components of MMW (i.e. components separable on the location of origin by citizens) while divertable components of MMW may be subdivided into materially recoverable and biodegradable (at their intersection is paper), which are be in part managed in different ways. The precondition for this division is primarily the strengthening of the continuing trend of improvement in MMW sorting directly by citizens, but at the same point the model should also reflect the operation of the mechanical or mechanical-biological treatment of waste, which would allow the separation of materially recoverable or biodegradable components (possibly both) from MMW.

Two different approaches are proposed in terms of the model design for forecasting MW waste management (with regard to the production of MMW from part of the production forecast):

1. ***Do not consider separately collected components as part of MMW***, which are now a part of MMW, but due to the improvements in sorting (or due to awareness campaigns or the influence of operation of facilities for mechanical and biological treatment) will be in the future diverted from this stream. This approach seems to be logical at the first glance, however it faces the following problems:
  - Because the separation is dependent on changing of the behaviour of citizens, it was not possible to implement this impact into the equations of the model defined in the section of production forecasts, which assumes forecast of MMW production under unchanged conditions – i.e. as a sum of sorted and unsorted components. Thus, if we would now consider as MMW only the remaining unsorted part, a conflict of both numeric values would arise .
  - Because the components derived from the MMW stream will not represent separate variables in the model, it will not be clear to what extent the diversion has occurred. This approach is not able to determine what quantity of MRW and BDMW was diverted from MMW, since these values become part of other sub-stream subject to other influences, and therefore their changes in time (increase) may not be used to infer the quantity of waste originating from MMW.
2. ***To consider diverted components of MMW still to be a part of the MMW stream***, although they are not physically present in MMW. The advantage of this approach is the ability to define the variables *brkosko*, *mvosko*, and *brkomvosko* in the model equations, which are included in the original forecasted production of MMW in the forecast of

production, and by using them, immediately obtain information on the quantity of diverted components from MMW. However, also this second approach faces a problem of a rather logical character:

- The diverted components of MMW are not physically a part of MMW, therefore their inclusion in this stream may give the wrong impression about the amount of MMW actually collected in the form of MMW.

To limit the above problems as much as possible, the MMW stream is discussed below in both versions and both variants are also shown in graphical and numerical model outputs.

### 2.5.2.3 Energy recovery of municipal waste

In the forecast, it is assumed that, based upon trends in some EU countries (Denmark, the Netherlands, Germany, Austria, Sweden, Switzerland, etc.), that an increasingly important role in the management of municipal waste will be played by its energy recovery, which should gradually replace MW disposal to landfills. The current capacity of the installations for energy recovery is insufficient. Therefore, a survey was conducted regarding the planned capacities of installations for energy recovery both on the basis of the status quo (3 WTEI operated in the Czech Republic (Prague, Brno and Liberec) with an aggregate capacity of 654000 tons/year) and on the basis of information on upcoming projects in various stages of completion.

The waste management forecast model will work on the assumption that the facilities for waste energy recovery will not be put into operation immediately at full operational capacity and therefore in the first year of operation only half capacity is assumed, which in the course of one year will reach the planned capacity. The resulting forecasted increase of the facility's capacity for energy recovery from municipal waste in the Czech Republic, as considered in the forecast of the Ministry of the Environment, is presented in Table 21.

<b>Table 21: Annual capacity of facilities for energy recovery from municipal waste (Mt)</b>												
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Capacity	0.63	0.63	0.68	0.72	0.72	0.72	0.80	0.95	1.15	1.25	1.37	1.47

### 2.5.2.4 Model basis

The model was designed as a dynamic, deterministic, partly descriptive and partly normative model. It is based on the forecast of municipal waste production and the composition of MMW, BDMW, MRW, and HW in MW. In the normative part the model solves the change in the management of particular waste streams in time by a system of equations defined both by legislative requirements (compliance is required, waste management in the Czech Republic should be focused in this direction by 2024), and also technical and logical requirements (e.g. limitations of the set intersections and union of sets of the respective

streams, etc.). Within these limits, the remaining degrees of freedom in the model (system of equations) are used by extrapolations of the current trends in waste management (descriptive part) or eventually described by expert inputs and assumptions chosen in such a way, so that the resulting system of MW management could be the best to execute and form a logical and operational unit.

**Basic assumptions of the model used and described in Section 2.5.2 were as follows:**

1. *The production of the waste streams total MW, MMW, BDMW, MRWs and HW in MW in the period 2013 to 2024 is provided by the results of the production of MW forecast model.*
2. *The totals of sub-streams relevant to the individual streams MMW, BDMW, MRW correspond to the total production in the given stream part of the production forecasts and the totals of each type of waste stream management match the production in this stream (no waste can be lost and all produced quantity must be processed) from the part of production forecast.*
3. *The requirement of the Waste Framework Directive (increase by 2020 to at least 50 % by weight the overall level of preparing for re-use and recycling, at least for waste consisting of materials such as paper, metal, plastic and glass, originating from household waste and possibly of other origin, if these waste streams are similar to waste from households), based on methodology no. 2, pursuant to the Decision no. 2011/753/EU will be reached (estimated 46.5% in 2013) in 2017, see Table 18, (however, minor variations on the order of tenths of a percent are present, so it is possible to achieve the objective by a policy of active material recovery even earlier), while the magnitude of the share will continue to grow at a rate of about 1% per year throughout the forecasted period.*
4. *The projected increase of the capacity of the facilities for energy recovery (see Table 21) will be fully utilized.*
5. *The share of paper in MMW will grow slightly in a linear manner from 2013 to 2024. The trend of increase in the share of paper in MMW is one of the most significant processes in the composition of MMW according to the existing surveys conducted in various Czech cities.*
6. *The share of "residual waste" in MW with the exception of MMW, BDMW and MRW (i.e. part of bulky waste, street sweepings, sewage sludge, waste from markets, soil and stones etc.), see Figure 2, will slightly linearly decrease from 2013 to 2024. (This follows from the results of the model forecast for production, i.e. will decline from 9.4 % MW in 2013 to 5.2 % MW in 2024).*
7. *Composting and anaerobic digestion are only permitted for BDMW. For waste streams with the exception of BDMW, these technologies may not be used, in addition we assume that even paper will not be composted and anaerobically treated, but that it will be materially and energy (contaminated) recovered.*

8. *Materially recovered will be particularly the waste included in the MRW stream, however, in a minor way materially recovered will be also other waste included in streams MMW, BDMW and "residual waste" not included in these streams. Because there is no forecast for this waste, it is based on data from WMIS in the period 2009 – 2012, the quantity is considered to be constant over the period 2013 - 2024 (about 550000 t/year, represented mainly by waste 20 02 02 Soil and stones, 20 03 03 Street sweepings and others, according to the data from 2012).*
9. *Only such MRW will be used for energy recovery that is contaminated or not recoverable, and the share of this waste will linearly decrease from 8.0% in 2013 to 2.6% in 2024. This value corresponds to the results of a survey of materially recoverable waste components from separate collection (i.e. the assumption that all of the materially recoverable waste will gradually be collected in a way that reaches 97.4% of "purity") - ideally by separated collection by citizens).*
10. *The share of energy recoverable separately collected MRW and also the share of MRW diverted from MMW in the total energy utilization of MRW will be constant over the period 2013-2024.*
11. *Most of separately collected MRW in MW will be materially recovered and this share (i.e. the materially recovered separately collected MRW with respect to the total of separately collected MRW) is approximately constant over the period 2013-2024. This assumption is due to the currently already high proportion of materially recovered components collected separately (> 85% in 2012, i.e. the proportion of actually materially recovered MW without MMW to the total of separately collected materially recovered MW without MMW in 2012), further the lack of forecast that would evaluate the expected impact of the introduction of new technologies. Nevertheless, it can be assumed that this share should neither decrease considerably nor grow and therefore this uncertainty affects the results of the model only minimally.*
12. *Approximately 50% of paper diverted from the current MMW stream will be materially recovered.*
13. *The share of materially recovered waste diverted from MMW compared to the total content of materially recoverable components in MMW converges to the proportionate share for MRW, i.e. MRW materially recovered with respect to the total production of MRW excluding MMW (> 85% in 2012).*
14. *The quantity of composted and anaerobically recovered waste diverted from MMW linearly approaches the value of 44% of BDMW content in MMW which is the maximum possible share of the diverted BDMW, according to analyzes conducted at various locations in the Czech Republic.*
15. *Hazardous waste HW in MW will not be composted and anaerobically recovered.*
16. *Material recovery of separately collected paper linearly approaches 98% (i.e. the average of the years 2010-2012, which is considered as an achievable maximum limit).*
17. *The share of materially recovered separately collected garden and kitchen waste is no different from the share of materially recovered BDMW as a whole.*

18. *Almost the entire amount (100%) of BDMW production may be composted or anaerobically recovered.*
19. *The share of "residual waste" in MW excluding MMW, BDMW and MRW (i.e. part of 20 03 07 bulky waste, 20 03 03 street sweepings, 20 03 02 waste from marketplaces, 20 02 02 soil and stones etc.) deposited in landfills will decrease (estimated target value is about 35% of landfilled "residual waste" by 2024).*
20. *The amount of hazardous waste disposed of by incineration in individual streams is provided by extrapolation of waste management for the years 2009 -2012.*

These conditions briefly define the framework of *the system of model equations (a total of 76 equations)*, which allow the calculation of a solution for all variables - waste sub-streams provided in chapter 2.5. 2.

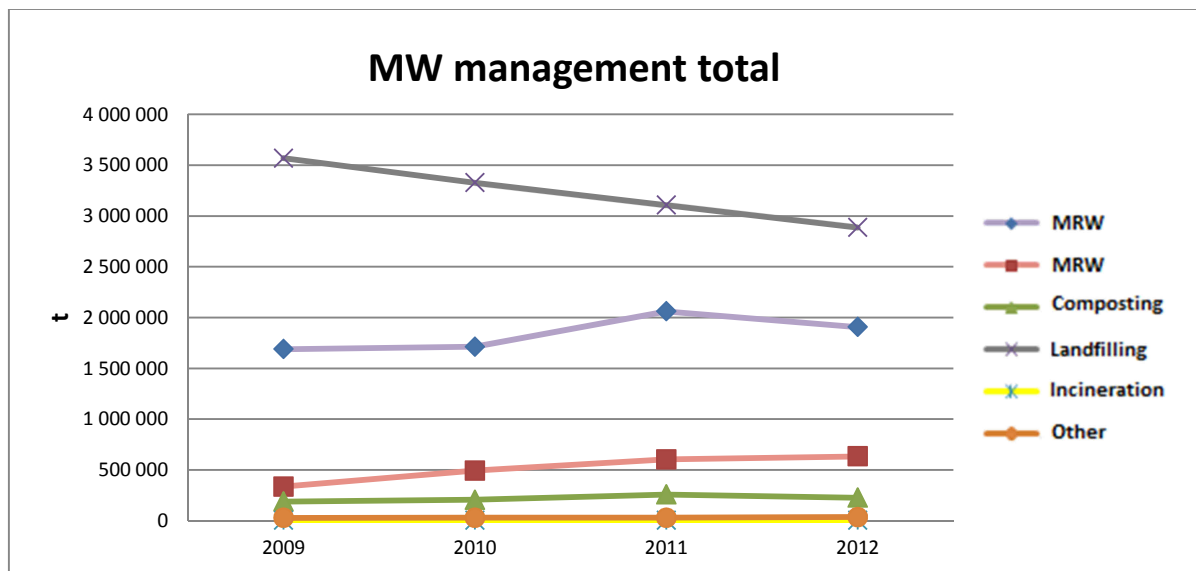
## 2.5.3 Forecast final output data

This chapter describes the forecast of municipal waste management of waste streams total MW, MMW, BDMW, MRW, and HW in MW.

### 2.5.3.1 Municipal waste Trends in 2009-2012

Tables 18 and 19 provide data on the management of MW in the years 2009 - 2012 and Figure 19 shows graphs for each type of waste.

Figure 19: Management of MW in the period 2009 - 2012 (t).



Source: Ministry of the Environment, WMIS

## Municipal waste management forecast for 2013 to 2024

The developed forecasts of MW production imply that municipal waste production between 2013 and 2024 will decline slightly. Table 22 and Figures 27 and 28 show the results of forecasts calculated under the above assumptions provided in chapter 2.5.2. It can be seen that on the basis of these assumptions, due to the diversion of materially recoverable components of MMW, in the years 2013-2024 a decrease in landfilling occurs, compensated by a significant increase in material recovery of MW, by the development of composting and anaerobic digestion, and last but not least, by energy recovery.

The capacity forecast of facilities for power recovery from waste was made on the basis of the status quo (3 facilities in Prague, Brno and Liberec with an aggregate capacity of 630000 tons/year), and information about upcoming projects in various stages of completion.

By calculating waste management types to fit into the total production of MW, we acquire approximately linearly decreasing volume of landfilled MW, in a way ensuring compliance with specified requirements to restrict landfilling of biodegradable municipal waste stipulated by the Landfill Directive and material recovery of MRW stipulated in the Framework Directive. The trend of reduced landfilling thus corresponds to the expected ban or one of the variants of a significant reduction in landfilling of untreated waste (i.e. more or less waste of group 20, because the products of waste treatment are reported in group 19 and inert waste (soil etc. represents in group 20 a marginal item) in the period after<sup>9</sup> 2025.

The disposal of MW by incineration determined by extrapolating the current trend is and remains insignificant, see Tables 22 and 23 and Figures 20 and 21.

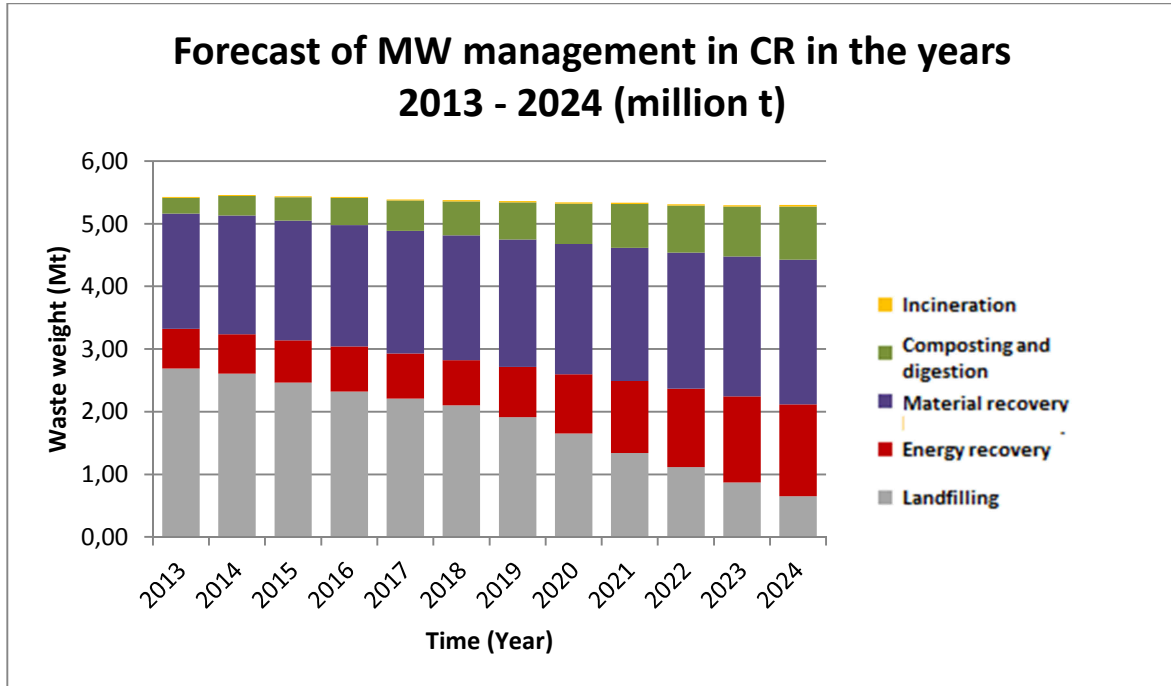
Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Material recovery</b>	1.84	1.89	1.91	1.94	1.96	1.99	2.03	2.07	2.12	2.17	2.23	2.31
<b>Composting</b>	0.25	0.31	0.37	0.43	0.49	0.54	0.60	0.65	0.70	0.75	0.80	0.85
<b>Energy recovery</b>	0.63	0.63	0.68	0.72	0.72	0.72	0.80	0.95	1.15	1.15	1.37	1.47
<b>Landfilling</b>	2.69	2.61	2.46	2.32	2.21	2.10	1.91	1.65	1.34	1.12	0.87	0.65
<b>Incineration</b>	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Figures 20 and 21 show the municipal waste management in the years 2013 - 2024

<sup>9</sup> No particular form of restriction/prohibition of landfilling is considered; this is not an assumption of the model, only the result, which says that it is realistic in the reviewed period to reduce landfilling by 2025, and then completely prohibit it.



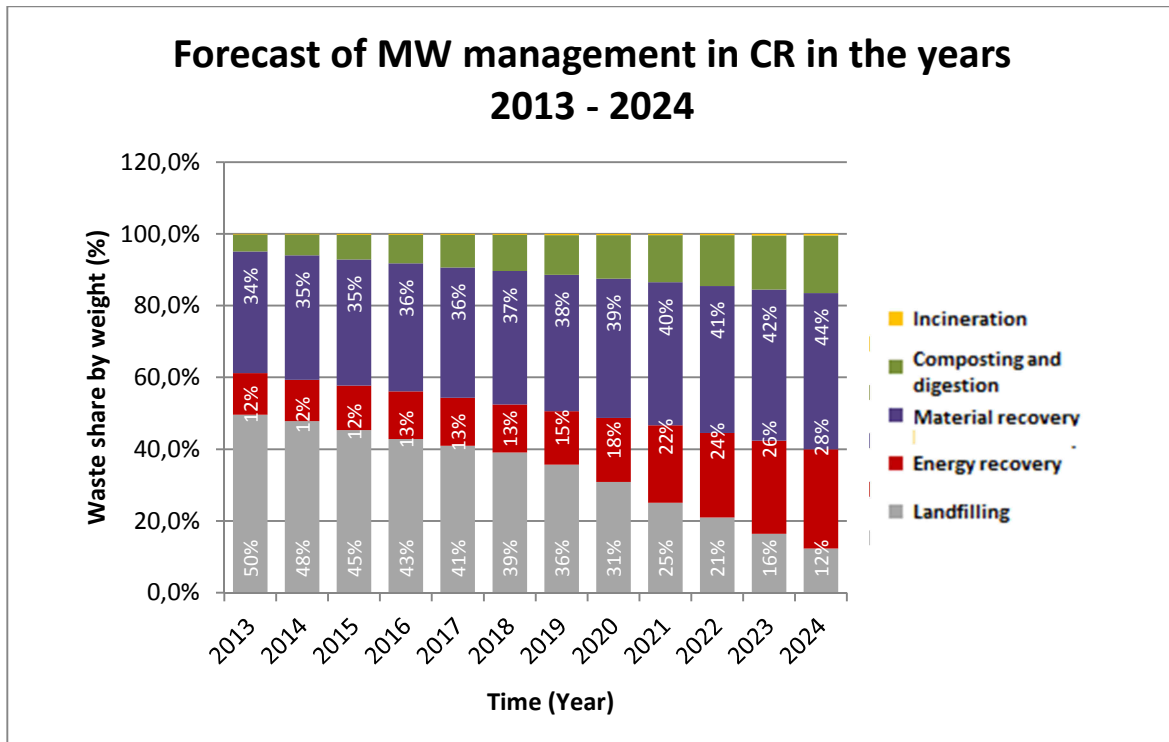
Figure 20: Forecast of municipal waste management (Mt).



**Table 23: Forecast of municipal waste management (%)**

Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Composting	4.7	5.7	6.9	8.0	9.0	10.1	11.1	12.1	13.1	14.1	15.1	16.1
Material recovery	33.9	34.7	35.1	35.7	36.3	37.1	37.9	38.8	39.8	40.9	42.2	43.5
Energy recovery	11.6	11.5	12.4	13.3	13.4	13.4	14.9	17.8	21.6	21.7	25.9	27.7
Landfilling	49.6	47.8	45.3	42.8	41.0	39.1	35.7	30.9	25.1	21.0	16.5	12.3
Incineration	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4

Figure 21: Forecast of municipal waste management in %



From the final waste management forecast (Tables 22 and 23 and Figures 20 and 21) it can be seen that:

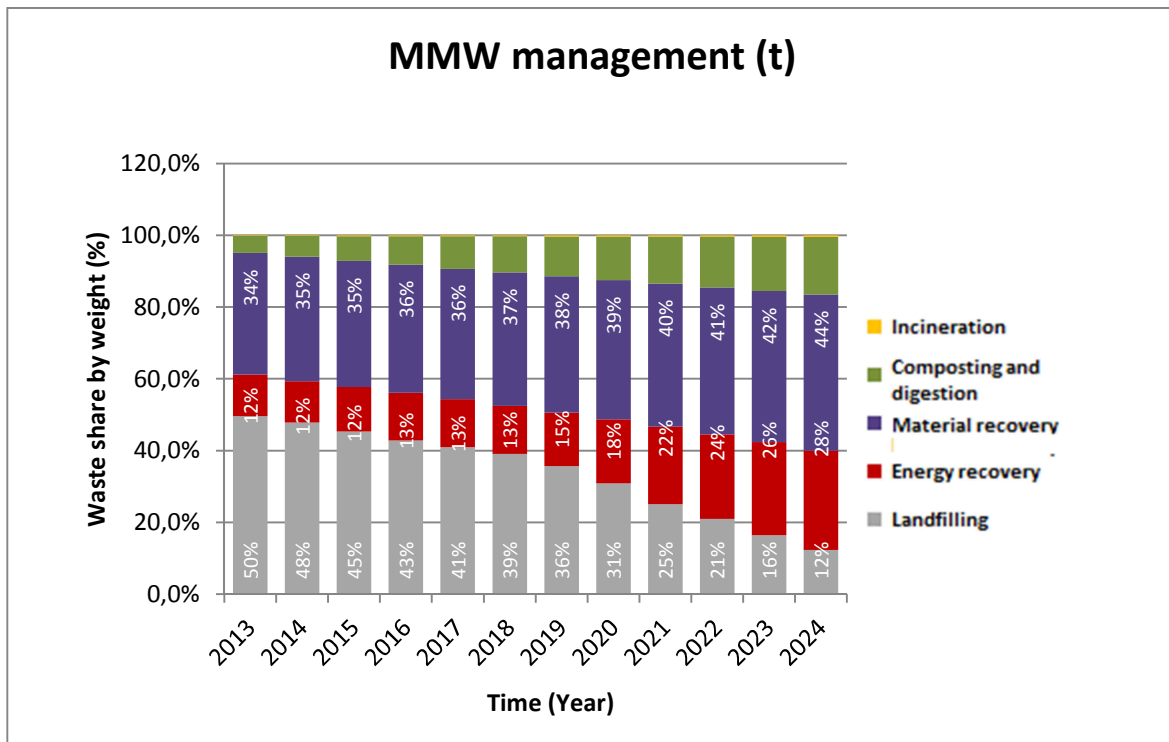
- *Composting of MW* should have in the years 2013-2024 a growing trend from 4.7% in 2013 to 16.1% in 2024, from the total MW production calculated in the production forecast, i.e. 1.03% per annum (= 22.1% of the original share annually),
- *Material recovery of MW* should increase in the years 2013 to 2024 from 33.9% in 2013 to 43.5% in 2024, from the total MW production calculated in the production forecast, i.e. 0.87% per annum (= 2.6% of the original share annually),
- *Energy recovery from MW* should increase in the years 2013 to 2024 from 11.6% in 2013 to 27.7% in 2024, from the total MW production calculated in the production forecast, i.e. 1.46% per annum (= 12.6% of the original share annually),
- *Disposal of MW by landfilling* should decrease in the years 2013-2024 from 49.6% in 2013 to 12.3% in 2024, from the total MW production calculated in the production forecast, i.e. 3.4% per annum (= 6.8% of the original share annually) and
- *Disposal of MW by incineration* should remain in the years 2013-2024 at the level of 0.03% from the MW production.

## 2.5.3.2 Mixed municipal waste

### Trends in 2009-2012

Tables 18 and 19 provide input data on the management of MMW in the years 2009 - 2012 and Figure 22 shows graphs for each type of waste management. Data on composting and anaerobic digestion were not systematically recorded in the MW waste management data in the years 2009 - 2012 and therefore are not provided in Tables 18 and 19 and Figure 22.

Figure 22: MMW management in the period 2009 - 2012 (t).



### Forecast of mixed municipal waste management for 2013 - 2024

The most important specific assumptions used in the forecasting model with regard to MMW may be summarized as follows:

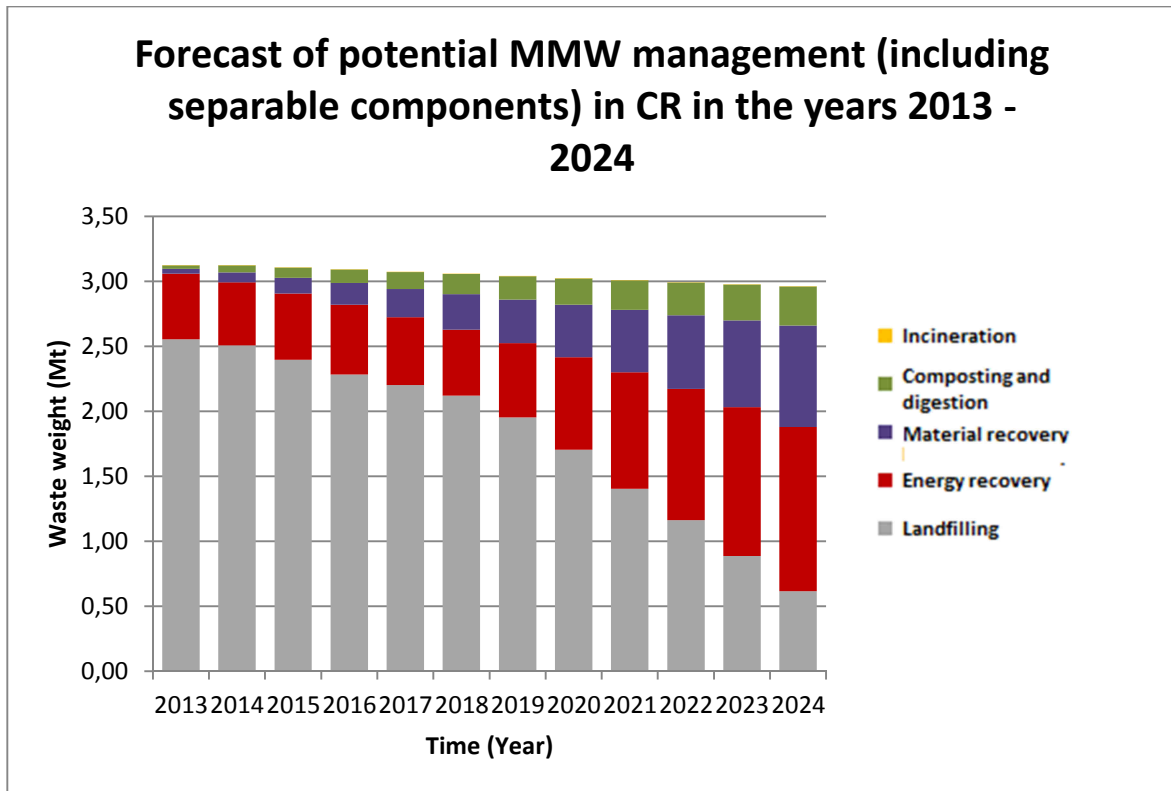
1. The production of MMW in the period 2013 - 2024 was adopted from the production forecast.
2. The requirement of the Framework Waste Directive (increase by 2020 to least 50%, by weight, the preparing for re-use and recycling) will be achieved no later than 2019.
3. The estimated capacity of the facilities for energy recovery is considered as shown in Table 21 and will be fully utilized.
4. The share of paper in MMW from 2013 to 2024 will slightly increase in a linear manner. The growth trend in the share of paper in MMW is one of the most significant processes in the composition of MMW according to surveys conducted in various Czech cities.

5. Material recovery will cover approximately 50% of paper diverted from the current MMW stream.
6. The share of other materially recovered waste diverted from MMW compared to the overall content of materially recoverable components in MMW converges to the respective share for MRW (i.e. the materially recovered MRW with regard to the total production of MRW, excluding MMW, e.g. is higher than 85% in 2012).
7. The amount of composted and anaerobically recovered waste diverted from MMW linearly approximates the value of 44% content of BDMW in MMW, which is the maximum possible share of the diverted BDMW according to analyses conducted at various locations in the Czech Republic.

It can be seen from Table 24 that the diversion of a part of the materially recoverable components of MMW in the years 2013-2024 should lead to a significant increase in material recovery of MMW and to the development of composting and anaerobic digestion of BDMW diverted from MMW.

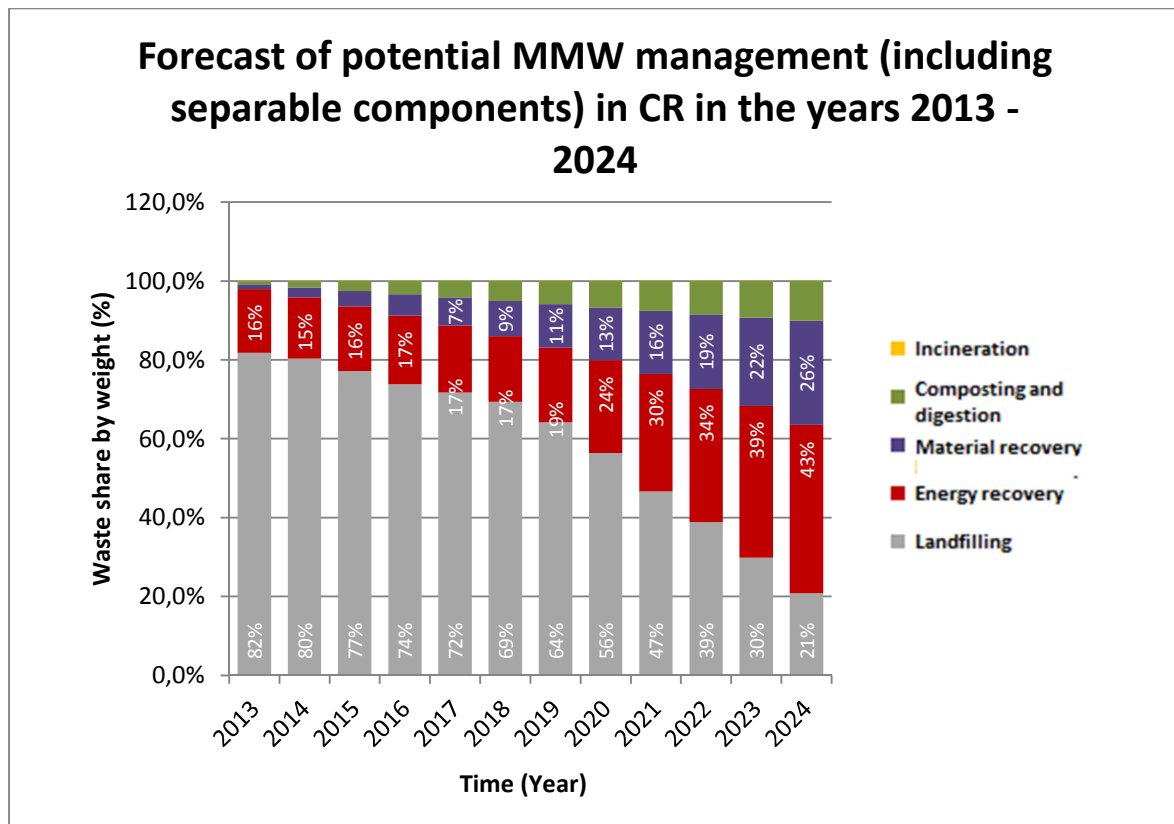
<b>Table 24: Forecast of management of potential mixed municipal waste (Mt)</b>												
<b>Management</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Composting</b>	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30
<b>Material recovery</b>	0.04	0.08	0.12	0.17	0.22	0.27	0.34	0.40	0.48	0.57	0.67	0.78
<b>Energy recovery</b>	0.51	0.48	0.51	0.54	0.52	0.51	0.57	0.71	0.90	0.91	1.15	1.26
<b>Landfilling</b>	2.55	2.51	2.39	2.28	2.20	2.12	1.95	1.70	1.40	1.16	0.89	0.62
<b>Incineration</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 23: Forecast of management of potential MMW (i.e. including separable components) (Mt).



Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Material recovery	0.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.6	8.4	9.3	10.1
Composting	1.2	2.5	3.9	5.4	7.1	9.0	11.0	13.4	16.0	19.0	22.4	26.4
Energy recovery	16.2	15.5	16.4	17.4	17.0	16.6	18.9	23.5	29.8	33.8	38.5	42.7
Landfilling	81.8	80.3	77.1	73.8	71.7	69.4	64.2	56.4	46.6	38.8	29.8	20.8
Incineration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 24: Forecast of management of potential MMW (i.e. including separable components) in %.



Figures 23 to 24 show the management of MMW in the years 2013 - 2024 as the total potential MMW (i.e. including separable components) where the total amount of MMW corresponds to the forecasted production of MMW in the production forecast.

Table 26 shows the MMW management forecast, without separable components.

Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Energy recovery	0.51	0.48	0.51	0.54	0.52	0.51	0.57	0.71	0.90	0.91	1.15	1.26
Landfilling	2.55	2.51	2.39	2.28	2.20	2.12	1.95	1.70	1.40	1.16	0.89	0.62
Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 25 shows the management of residual MMW, where the total quantity of MMW is shown without the separable components.

Figure 25: Forecast of MMW management excluding separable components (Mt).

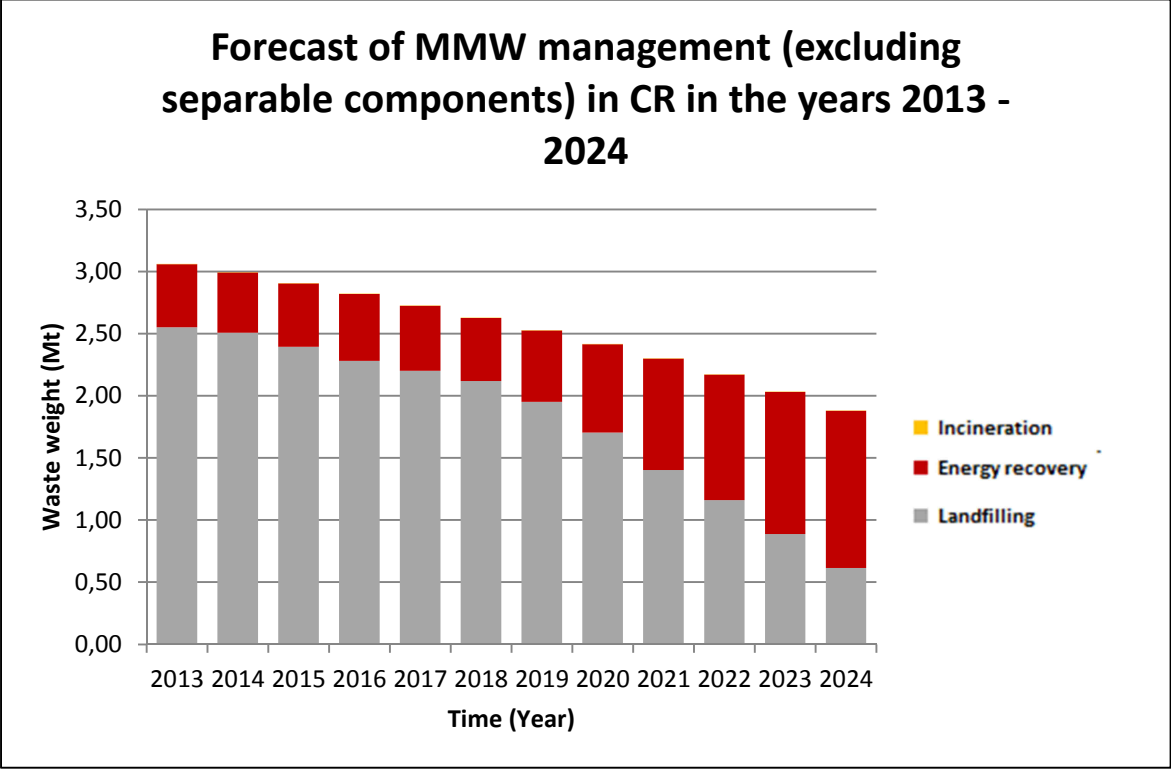


Figure 26 shows MMW management without separable components in %.

Figure 26: Forecast of MMW management without separable components in %.

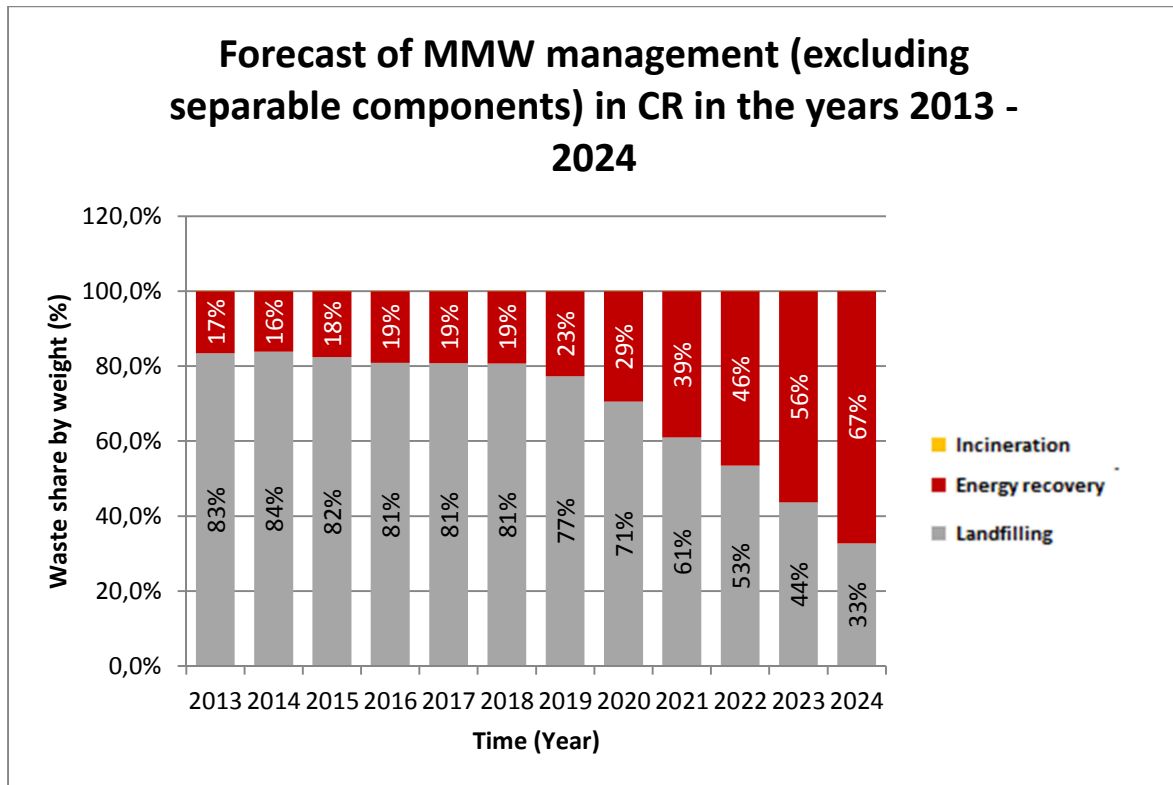


Table 27 then shows the forecast provided as percentage of the total represented by residual MMW (i.e. non-diverted = without separable components).

Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Energy recovery	16.5	16.2	17.6	19.1	19.2	19.3	22.7	29.4	39.0	46.5	56.3	67.2
Landfilling	83.5	83.8	82.4	80.9	80.8	80.7	77.3	70.6	61.0	53.5	43.6	32.8
Incineration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

From Tables 24 to 27 and Figures 23 to 26 it can be seen that according to the waste management forecast:

- *Composting and anaerobic digestion of separable components* of MMW should have in the years 2013 - 2024 a growing tendency from the forecasted 0.8% in the year 2013 to 10.1% in 2024, i.e. 0.9% per annum of potential MMW (= 105.7% of the original share annually), in the variant of MMW without separable components thus composting of MMW remains approximately zero.
- *Material recovery of potential MMW* (i.e. especially its *separable components* either by citizens or by mechanical and biological treatment) should increase in the years 2013 to 2024 from 1.2% in 2013 to almost 26.4% in 2024 from the total production of



MMW adopted from the production forecast, i.e. 2.3% per annum (= 190.9% of the original share annually); in the variant without separable components, the share of materially recovered MMW will not change and remains almost zero.

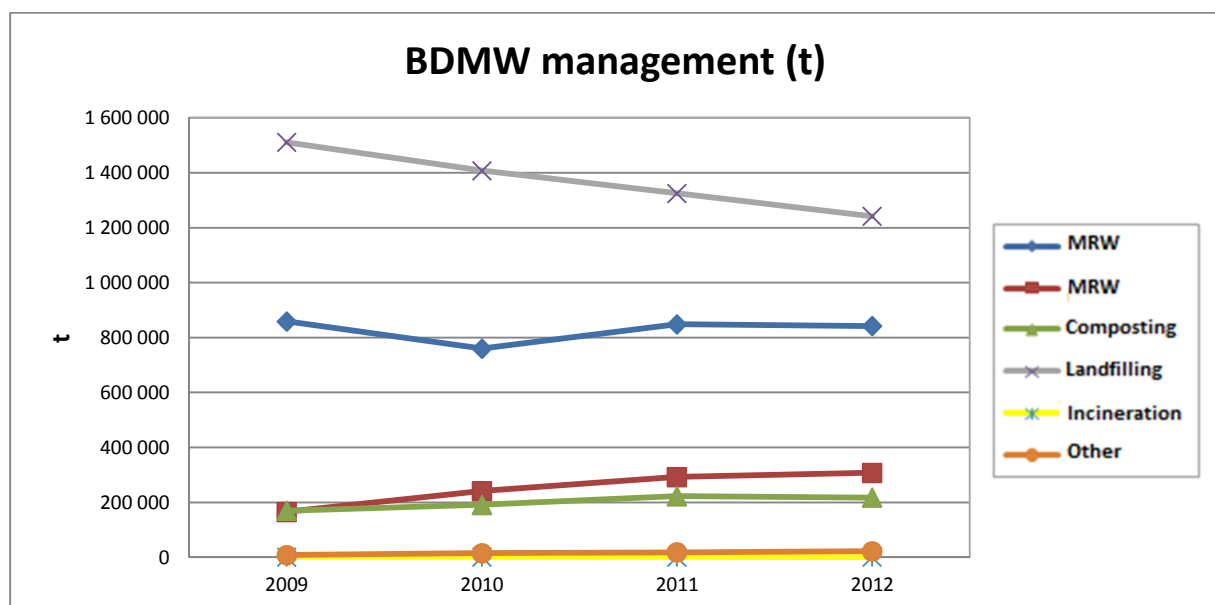
- *Energy recovery from potential MMW* (i.e. in the variant with separable components) should increase from about 16.2% in 2013 to 42.7% in 2024, from the total production of MMW adopted from production forecast, i.e. 2.4% annually (= 14.9% annually of the original share), *in the variant MMW without separable components, energy recovery increases* from 16.5% in 2013 to 67.2% in 2024, i.e. 4.8% per year (= 29.3, 7% of the original share annually).
- *Disposal of potential MMW* (i.e. in the variant with separable components) *landfilling* should fall in the years 2013-2024 from 81.8% in 2013 to 20.8% in 2024 from the total production of MMW adopted from production forecast, i.e. 5.5% annually (= 6.8% annually of the original share), in the variant MMW without separable components it decreases from 83.5% in 2013 to 32.8% in 2024, i.e. 4.8% (= 5.8% annually of the original share year).
- *Disposal of MMW* by incineration remains in the years 2013-2024 at the level of 0.03% of MMW production adopted from the production forecast.

### 2.5.3.3 Biodegradable municipal waste

#### Trends in 2009-2012

Tables 18 and 19 provide data on BDMW management in the years 2009 - 2012.

Figure 27: BDMW management in the period 2009 - 2012.



## Forecast of biodegradable municipal waste management for 2013 to 2024

The most important specific assumptions used in the forecasting model with regard to BDMW may be summarized as follows:

1. The production of BDMW in the period 2013-2024 was adopted from the production forecast model.
2. Composting and anaerobic digestion is only permitted for BDMW, these technologies may not be used for waste streams other than BDMW, additionally not even paper would be composted and anaerobically recovered.
3. Compost or anaerobically recover preferable the total production of BDMW.

A central role in BDMW management will be played in the near future on the one hand by the introduction of compulsory BDMW collection from citizens and promoting of composting and anaerobic digestion supported by convenient construction of new capacities (composting and biogas plants), which should provide composting capacity of up to 850 kt of BDMW in 2024.

The current capacity of composting plants is unevenly distributed in the Czech Republic and will need to be finalized where these capacities are missing.

From Tables 28 and 29 and Figures 28 and 29 it can be seen that a slight increase of about 12% occurs also in the material recovery of BDMW beyond composting and anaerobic digestion, i.e. recycling mainly of paper and wood, whose energy recovery should be restricted within the possibilities of material recovery of such waste. Energy recovery of BDMW is not significant even at present, however, its decline should continue down to 20 kt in 2024.

Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Composting	0.25	0.31	0.37	0.43	0.49	0.54	0.60	0.65	0.70	0.75	0.80	0.85
Energy recovery	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.04	0.02
Material recovery	0.84	0.88	0.92	0.96	0.99	1.03	1.06	1.10	1.14	1.17	1.21	1.24
Landfilling	1.11	1.02	0.94	0.85	0.77	0.68	0.60	0.53	0.45	0.38	0.30	0.23
Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 28 shows the management of biodegradable municipal waste in the years 2013 - 2024

Figure 28: Forecast of biodegradable waste management in (Mt).

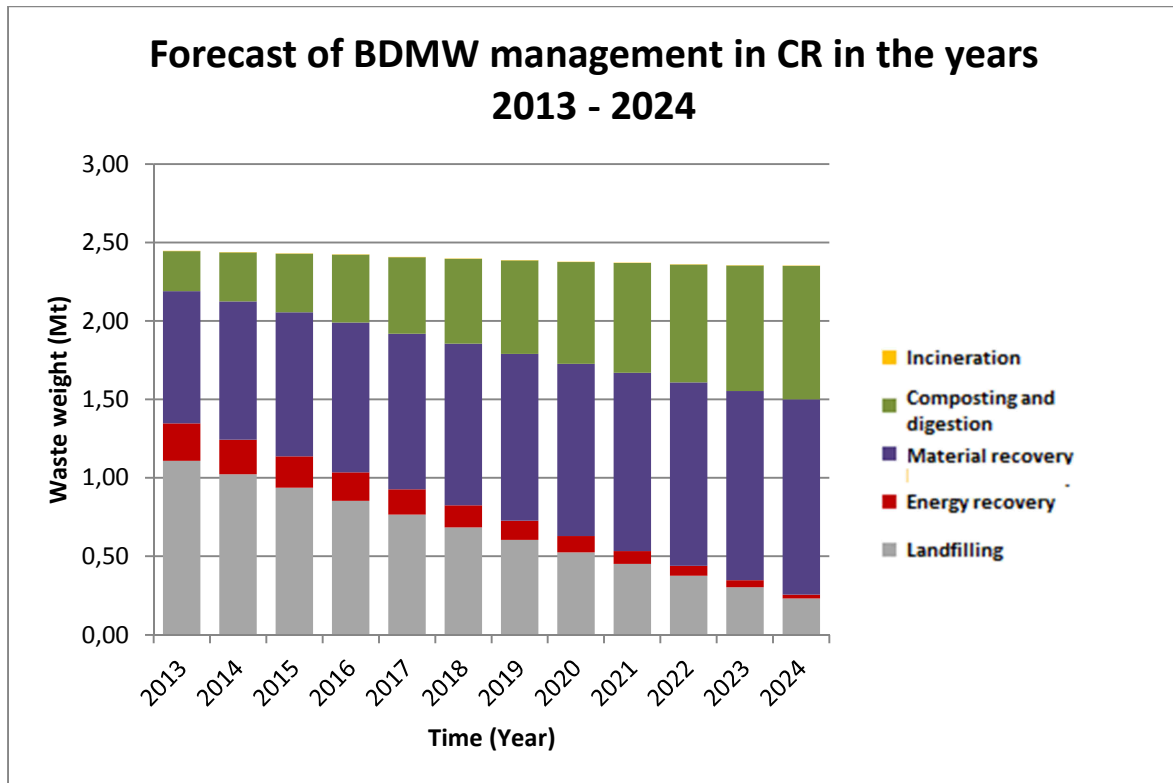
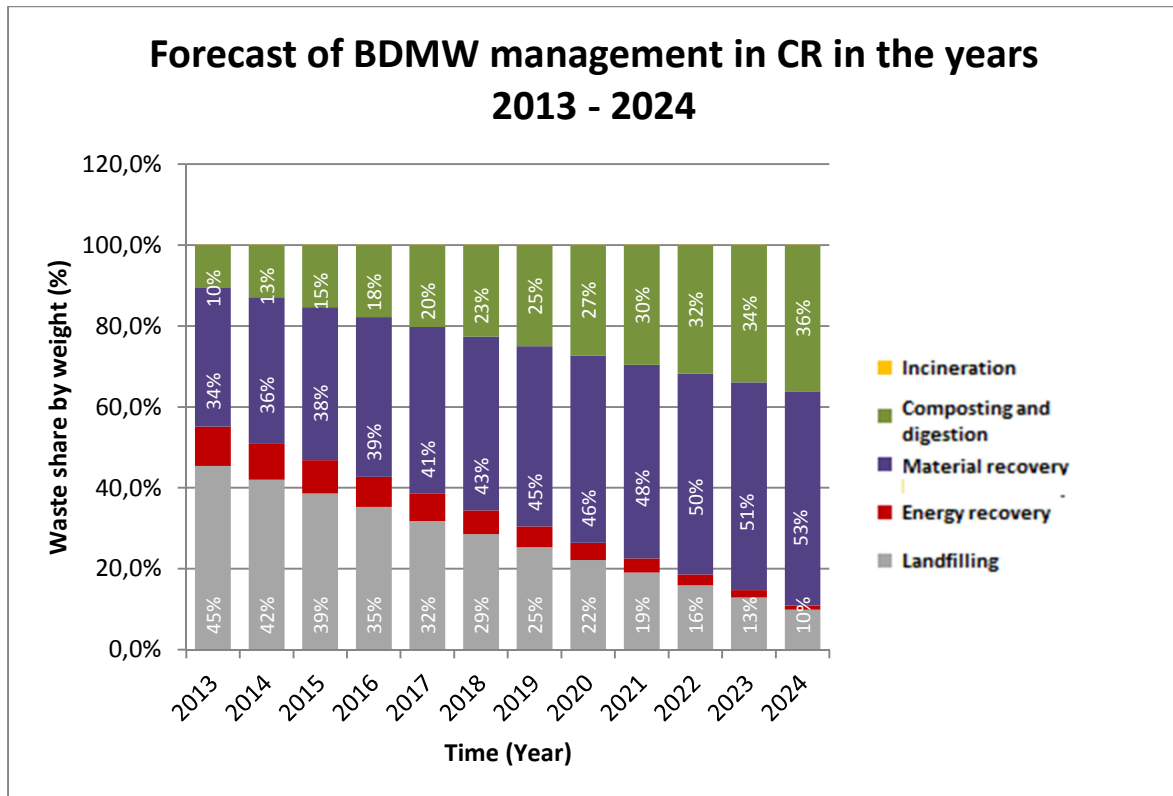


Table 29 and Figure 29 present and illustrate the management of biodegradable waste in %.

Table 29: Forecast of management of biodegradable municipal waste (%)												
Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Composting	10.4	12.9	15.4	17.8	20.2	22.6	25.0	27.3	29.6	31.8	34.0	36.2
Energy recovery	9.7	9.0	8.2	7.4	6.7	5.9	5.1	4.3	3.5	2.7	1.9	1.0
Material recovery	34.4	36.1	37.8	39.5	41.2	42.9	44.6	46.3	47.9	49.6	51.3	52.9
Landfilling	45.4	42.0	38.6	35.3	31.8	28.6	25.3	22.2	19.0	15.9	12.9	9.9
Incineration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 29: Forecast of biodegradable waste management in %.



From Tables 27 and 28 and Figures 28 and 29 it can be seen that according to the waste management forecasts:

- *Composting of BDMW* should have in the years 2013 - 2024 a rising trend from 10.4% in 2013 to about 36.2% in 2024 of total BDMW production adopted from the production forecast, i.e. 2.3% per annum (= 22.6% of original share annually).
- *Material recovery of BDMW* should increase in the years 2013-2024 from 34.4% in 2013 to 52.9% in 2024 of total BDMW production adopted from the production forecast, i.e. 1.7% per annum (= 4.9% of the original share annually).
- *Energy recovery from BDMW* should fall in the years 2013-2024 from 9.7% in 2013 to 1.0% in 2024 of total BDMW production adopted from the production forecast, i.e. 0.8% per annum (= 8.2% annually of the original share annually),
- *Disposal of BDMW by landfilling* should fall in the years 2013-2024 from 45.4% in 2013 to 9.9% in 2024 of total BDMW production adopted from the production forecast, i.e. 3.2% per annum (= 7.1% of the initial share annually),
- *Disposal of BDMW by incineration* in the period 2013 to 2024 will decline slightly from 0.02% in 2013 to 0.01% in 2024 of total BDMW production adopted from the production forecast.

### 2.5.3.3.1 Fulfilment of the Landfill Directive requirements

A specific requirement for the BDMW stream is the limitation of its disposal by landfilling imposed by the Landfill Directive, which stipulates that by 2010 no more than 75% of BDMW is landfilled, compared to 1995 (production 1.53 Mt), by 2013 no more than 50% of BDMW, and by 2020 no more than 35% of BDMW, compared to 1995. The percentages of compliance with the Landfill Directive requirement, according to the waste management forecasts and requirements of the Directive are provided in Table 30.

As in the case of materially recoverable waste the procedure of Directive compliance criteria calculation differs from the simple calculation of the total quantity of landfilled BDMW in Table 29, as in this criterion includes only BDMW (and its landfilled share) from the municipalities (including other involved entities), whose landfilled share compared to the total stream is lower.

<b>Table 30: Disposal of BDMW by landfilling and share of 1995 production</b>												
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>Weight [Mt]</b>	0.77	0.71	0.65	0.59	0.53	0.47	0.42	0.36	0, 31	0.26	0.21	0.16
<b>Share of 1995 production [%]</b>	50.0	46.1	42.2	38.5	34.5	30.9	27.2	23.7	20.3	16.9	13.7	10 5
<b>Directive [max%]</b>	50.0							35.0				

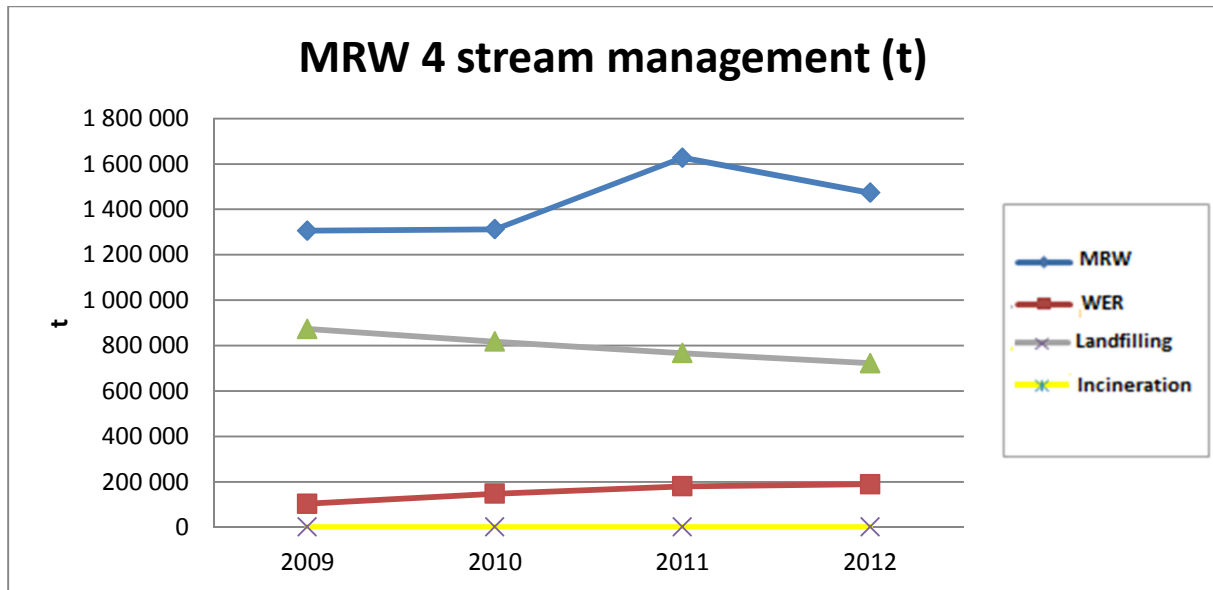
### 2.5.3.4 Materially recoverable components of municipal waste

This chapter deals with MRW 4, see Table 20.

#### Trends in 2009-2012

Tables 18 and 19 provide data on the management of the MRW 4 stream in the years 2009 - 2012. Data on composting and anaerobic digestion were not systematically recorded in the MW waste management data in the years 2009 - 2012 and therefore are not provided in Tables 18 and 19 and Figure 30.

Figure 30: Management of MRW 4 in the period 2009 – 2012



### Forecast of management of materially recoverable components of municipal waste for 2013-2024

The most important specific assumptions of the model with regard to the MRW stream may be summarized as follows:

1. The waste stream production of materially recoverable components in MW in the period 2013 to 2024 is based on the results of the production forecasts for the stream MRW 4.
2. The requirement the Framework Waste Directive (increase by 2020 to at least 50%, by weight, the overall level of preparing for re-use and recycling of waste, at least for materials such as paper, metal, plastic and glass, originating from household waste and possibly other of origin, if these waste streams are similar to waste from households), based on methodology no. 2, pursuant to the Decision No. 2011/753/EU, will be achieved no later than 2020, while the value of the share will continue to grow at a rate of about 1% per year throughout the forecasted period (according to the model, the objective will be achieved as early as 2017) .
3. Materially recovered will be particularly waste included in the waste stream MRW, however, in a minor way also other waste streams included in MMW, BDMW and residual waste outside of these streams will be materially recovered. Because there is no forecast for this waste stream, it is considered to be constant over the whole period 2013 - 2024 (about 550 000 t/year, mainly represented by waste 20 02 01, 20 02 02, 20 03 03 and others, according to the data in 2012).
4. Energy recovered will be only such materially recoverable waste that is contaminated or unusable, and the share of this waste will linearly decrease from 8.0% in 2013 to 2.6% in 2024. This value corresponds to the results of a survey of recoverability of separately collected materially recoverable components (i.e. the assumption that gradually all of

materially recoverable waste will be collected in a way that provides this percentage yield (purity) - ideally by separated collection by citizens).

5. The share of energy recoverable separately collected MRW and also MRW share diverted from MMW in total MRW energy recovered, will be approximately constant in the period 2013- 2024.
6. Most of separately collected MRW in MW will be materially recovered and this share (i.e. materially recovered separately collected MRW/total MRW collected separately) will be approximately constant over the period 2013 - 2024. The assumption is given by the already high proportion of material recovery of separately collected components (> 85% in 2012) and also by the absence of a forecast, that would evaluate the expected impact of the introduction of new technologies. However, it can be assumed that this share should not decrease/increase considerably and therefore this uncertainty affects the results of the model only minimally.
7. Paper diverted from the current MMW stream will be materially recovered by approximately 50%.
8. The share of materially recovered waste diverted from MMW compared to the overall content of materially recoverable components in MMW converges to the respective share for MRW, i.e. materially recovered MRW with respect to total MRW production excluding MMW (> 78% in 2012).
9. Material recovery of separately collected paper linearly approaches 98% (i.e. average value from the years 2010-2012 which is considered to be the achievable maximum limit).

The MRW management forecast is presented in Tables 31 and 32 and Figures 31 and 32. It can be seen that due to the fact that the forecasted production of MW in the period 2013 - 2024 will decrease slightly, landfilling of MRW will exhibit significant decrease to 272 kt in 2024 (i.e. a decrease of 54% compared to the forecast for 2013), as well as a decrease in energy recovery of MRW (this involves especially the diversion of materially recoverable components from MMW, whose energy utilization is on the opposite increasing) to the resulting 54.1 kt (a decrease of 66.9% compared to the forecast for 2013). As in other cases, the disposal of MRW by incineration without energy recovery has been, is and will be insignificant in the Czech Republic.

Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Composting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy recovery	0.16	0.16	0.15	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05
Material recovery	1.29	1.34	1.36	1.39	1.41	1.44	1.48	1.52	1.57	1.62	1.68	1.76
Landfilling	0.59	0.58	0.56	0.54	0.52	0.50	0.47	0.44	0.41	0.37	0.32	0.27
Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 31 shows management of materially recoverable components of municipal waste in the years 2013 - 2024

Figure 31: Forecast of management of materially recoverable components of municipal waste (Mt).

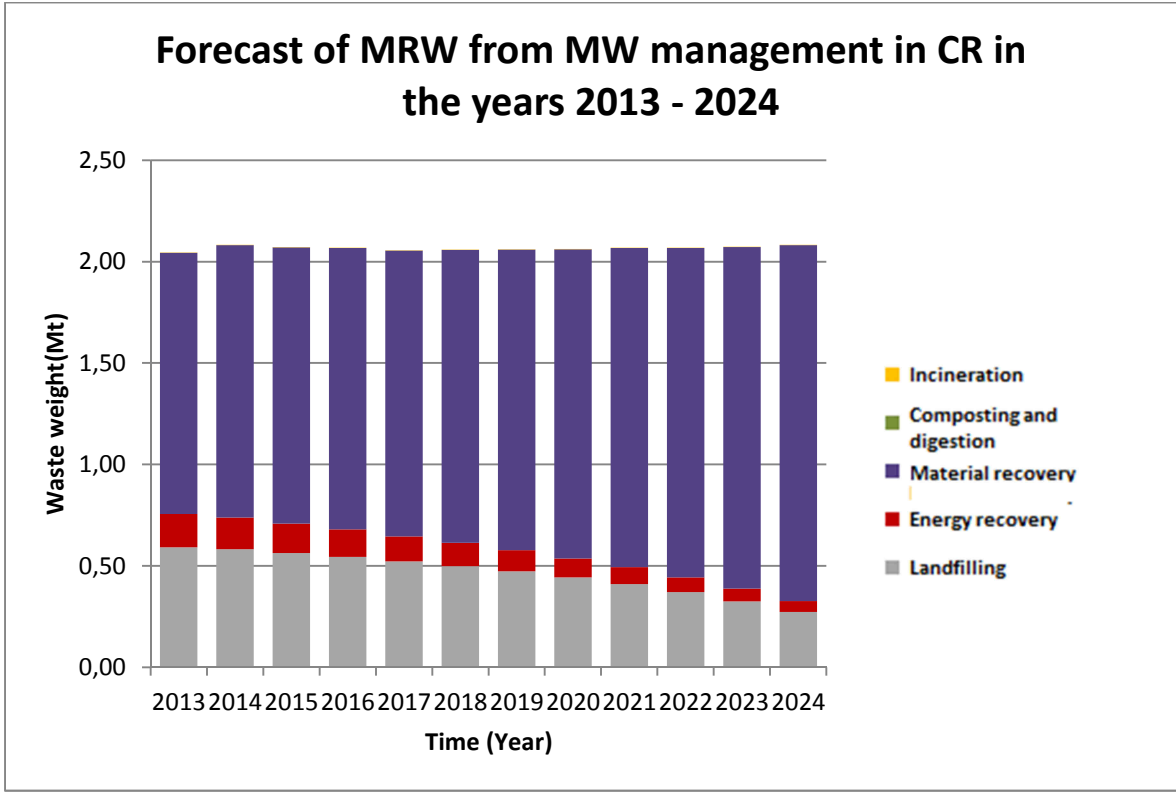


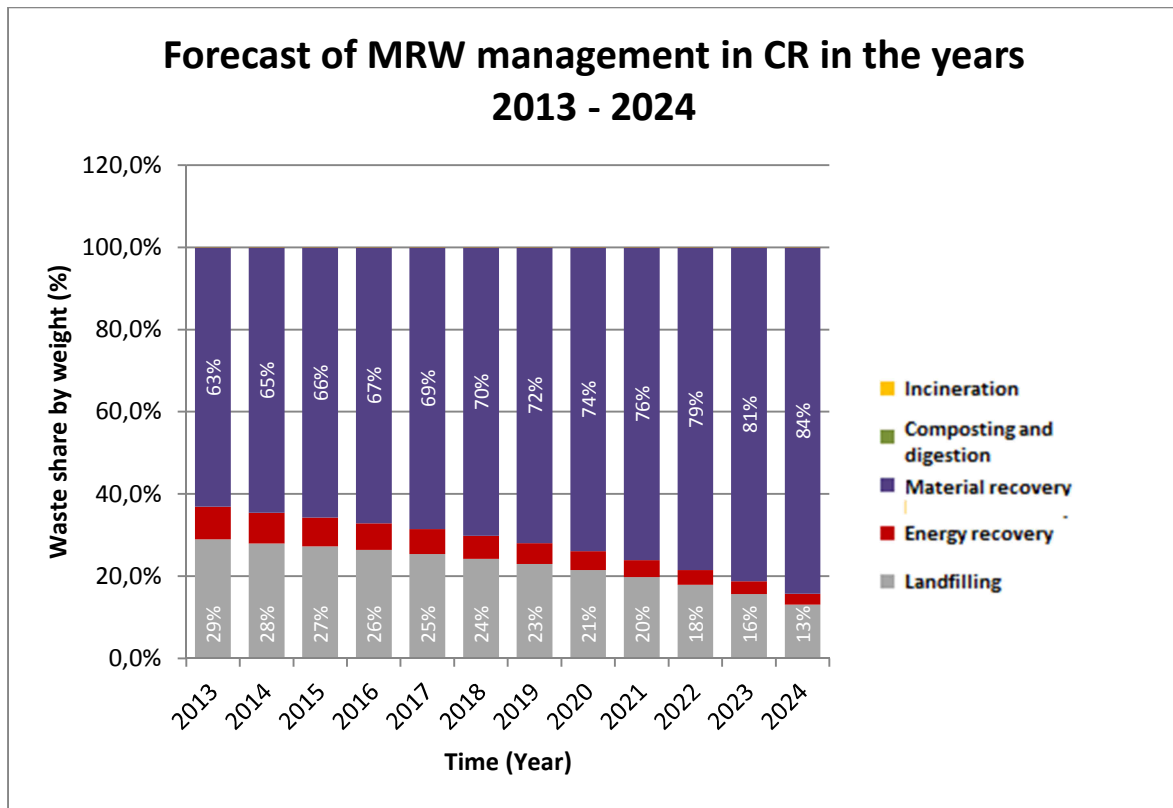
Table 32 and Figure 32 provide and illustrate the management of materially recoverable components of municipal waste %.

Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Composting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy recovery	8.0	7.5	7.0	6.5	6.0	5.5	5.1	4.6	4.1	3.6	3.1	2.6
Material recovery <sup>10</sup>	63.0	64.5	65.7	67.1	68.5	70.2	72.0	73.9	76.1	78.5	81.2	84.3
Landfilling	28.9	27.9	27.2	26.3	25.4	24.2	22.9	21.5	19.8	17.9	15.7	13.1
Incineration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

<sup>10</sup> The material recovery Indicator relates to all MRW without distinction, i.e. the production of municipalities and other non-municipal entities. This makes the values in this row of the table incomparable to those according to the methodology of calculation no. 2 of the Decision no. 753/2011/EC. The text therefore provides an estimate of fulfilling this criterion on the basis of the increase in the share of materially recoverable components relative to the value of this criterion in 2012, i.e. 45.5%.



Figure 32: Forecast of management of materially recoverable components of municipal waste in %.



From Table 30 and 31 and Figures 31 and 32 it can be seen that according to the management forecast:

- *Material recovery of MRW MW* should increase in the years 2013 to 2024 from 63.0% in 2013 to 84.3% in 2024, from the potential production of MRW MW (MRW 4 model is considered) of the forecast production, i.e. 1.9% per annum (= 3.1% annually of the original share).
- *Energy recovery of MRW MW* should decline in the years 2013 to 2024 from about 8.0% in 2013 to 2.6% in 2024, i.e. 0.49% per annum (= 6.1% annually of the original share).
- *Disposal of MRW MW by landfilling* should fall in the years 2013 to 2024 from 28.9% in 2013 to 13.1% in 2024, i.e. 1.4% per annum (= 5.0% annually of the original share).

#### 2.5.3.4.1 Fulfilment of the requirements of the Framework Waste Directive

The objective stipulated by the Framework Waste Directive is to achieve 50% utilization of materially recoverable components of MW in 2020, at the latest, according to the forecast, the Czech Republic will achieve no later than in 2017 a level exceeding 50% of recovered MRW (according to calculation methodology of no. 2 of Decision no. 753/2011/EC). In the

future years the approximately linear trend of increase with a moderate slowdown of materially recovered MW, as shown in Table 33, will continue.

<b>Table 33: Compliance with criteria for material recovery of MW components (methodology no. 2) (%)</b>												
<b>Management</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
<b>Percentage of recovered MRW</b>	46.4	47.5	48.4	49.4	50.5	51.7	53.0	54.5	56.1	57.9	59.9	62.1

The compliance criteria in Table 33 differ from row 3 of Table 32, since the values in this row apply to all MRW without distinction, i.e. the production of municipalities and non-municipal entities. As a result, they are not comparable with the criteria in Table 33, which is based on the calculation methodology no. 2 of Decision no. 753/2011/EC.

Special attention deserves the (potential) share of MMW included in the sum of MRW, which for all subjects (i.e. the total stream) represents in the assumption for 2013 18.3% and increases linearly to 31.6% in 2024. The increase is primarily due to the increasing share of waste paper in MMW. How much of this potential will be materially recovered according to the forecast to can be seen from the second row of Table 25.

**2.5.3.5 Hazardous waste in municipal waste**

The production forecast of HW in MW assumes an increase of HW in MW by 2024 by about 30% (Table 34), the clear trend here is the decrease in material recovery and increase in landfilling of hazardous waste. In view of the fact that the production of HW in MW represents only 0.0075% of the MW production, the quantification of interactions amongst the sub-streams MMW, BDMW, and MRW and the share of hazardous waste in them, is on the limit of a statistical error, so the forecast of HW management was not designed as a system of equations, but the same prediction methodology was used as in the production forecasts, i.e. extrapolation of individual types of waste management using linear and exponential trends over the data for the years 2009 - 2012.

The increase in the production of HW in MW is largely offset by the increase in incineration in hazardous waste incinerators, whose share in the processing of hazardous components of MW should increase from 18.8% to 30.6% in 2024. In contrast, there is a long-term trend of reduction of the share of recovered hazardous constituents in MW, which is expected to continue at a decreasing rate also in the future. However, it must be noted, that due to the relatively small quantities of HW in MW (9.72 kt in 2013 to 12.7 kt in 2024) the inertia of processes in this waste stream is substantially smaller than that of the preceding streams and the changes caused by the development of legislation and changes in economic conditions may have much stronger impact and be and less predictable.

Table 34: Forecast of management of hazardous waste components of municipal waste (kt)												
Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Composting	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy recovery	0.32	0.31	0.30	0.29	0.28	0.27	0.26	0.26	0.25	0.23	0.22	0.21
Material recovery	3.99	3.37	2.85	2.41	2.03	1.72	1.45	1.23	1.04	0.88	0.74	0.62
Landfilling	3.58	4.28	4.79	5.29	5.82	6.24	6.63	7.00	7.27	7.60	7.82	7.94
Incineration	1.83	1.97	2.13	2.28	2.45	2.62	2.80	3.00	3.20	3.41	3.63	3.86

Figure 33 shows the management of HW in MW in the years 2013 – 2024.

Figure 33: Forecast of management of hazardous waste components of municipal waste.

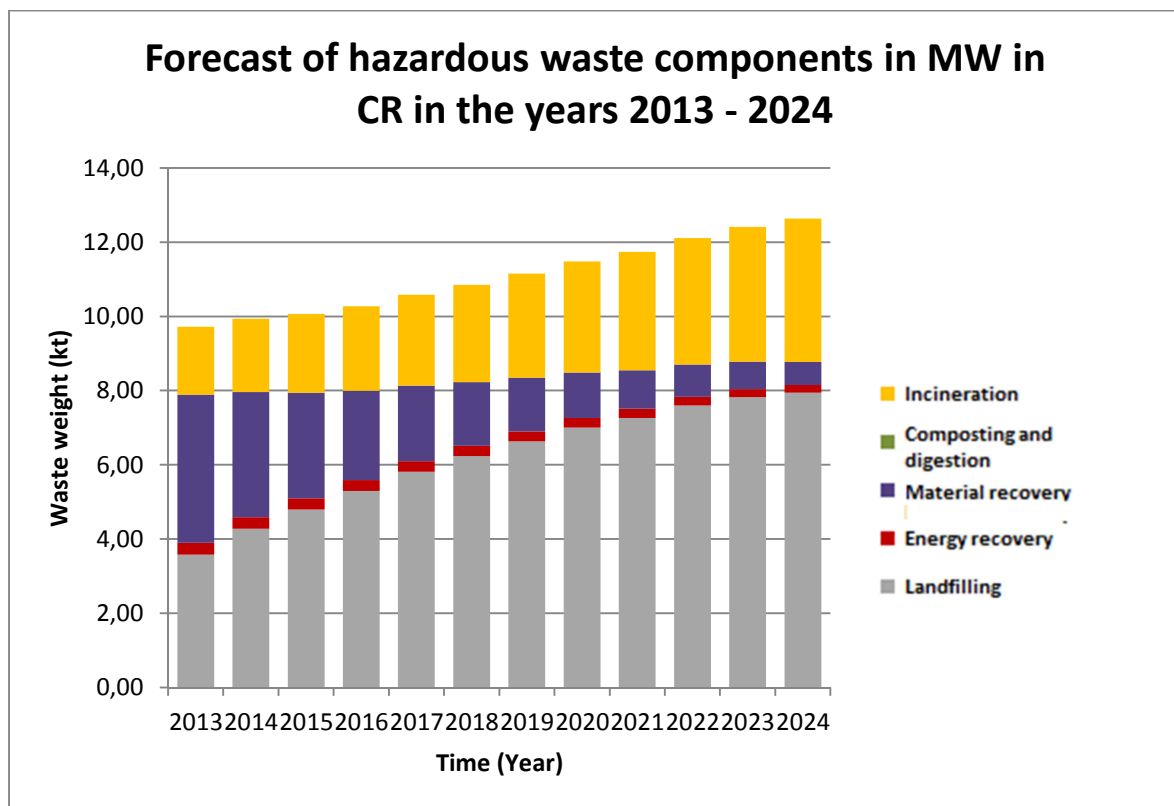
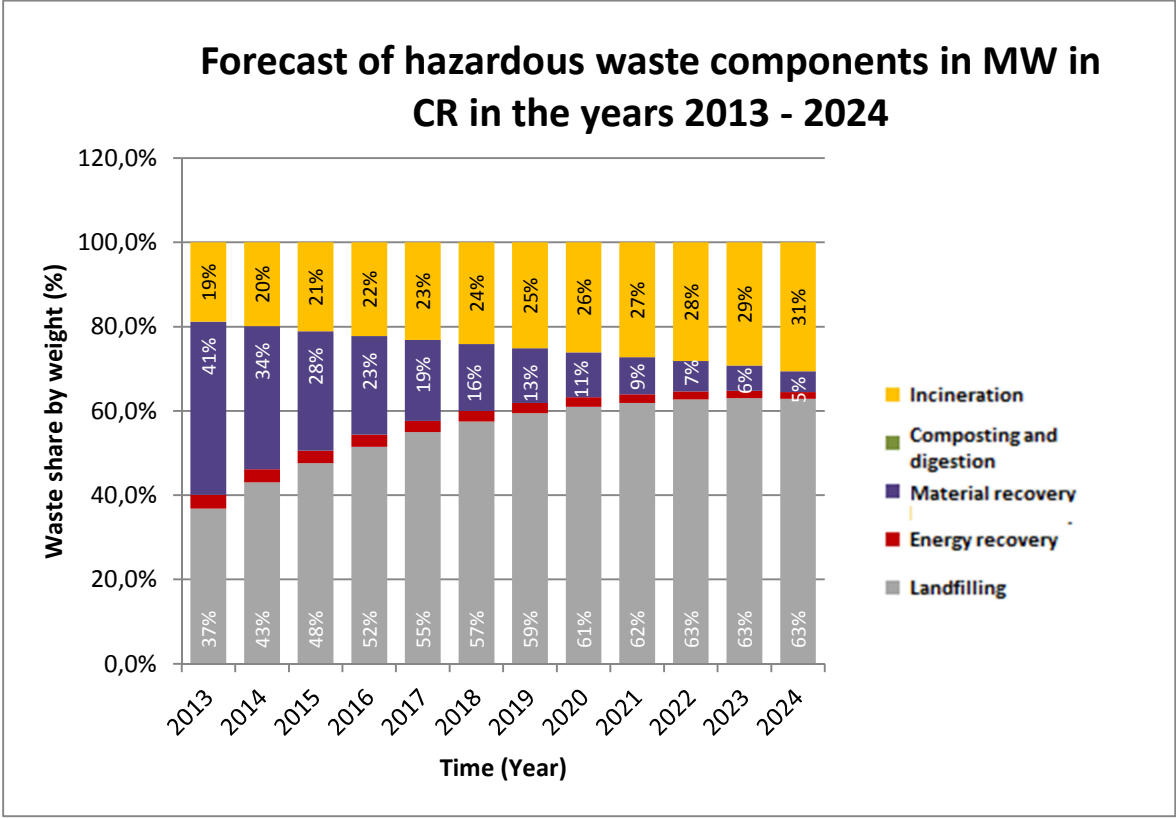


Table 35 and Figure 34 present and illustrate the management of hazardous waste components in municipal waste in %.

Table 35: Forecast of management of hazardous waste components of municipal waste (%)												
Management	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Composting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy recovery	3.3	3.1	3.0	2.9	2.7	2.5	2.4	2.2	2.1	1.9	1.8	1.6
Material recovery	41.0	33.9	28.3	23.4	19.2	15.8	13.0	10.7	8.8	7.2	6.0	4.9
Landfilling	36.8	43.0	47.6	51.5	55.0	57.5	59.5	61.0	61.9	62.7	63.0	62.8
Incineration	18.8	19.9	21.1	22.2	23.1	24.2	25.1	26.1	27.2	28.1	29.2	30.6

Figure 34: Forecast of management of hazardous waste components of municipal waste in %.



## 2.5.4 Summary of forecasts for the period 2013 - 2024

From the final forecasts of municipal waste management (see Tables 22 and 23 and Figures 20 and 21) it can be seen that:

- *Material recovery of MW should increase in the years 2013-2024 from 33.9% of total MW production (i.e. 1.84 Mt) in 2013 to 43.5% of total MW production (i.e. 2.31 Mt) in 2024, i.e. an increase of 0.87% per annum of the total MW production (= 2.6% of the original share annually).*
- *Composting of MW should have a rising trend in the years 2013 – 2024, from 4.7% of total MW production (i.e. 0.25 Mt) in 2013 to 16.1% of total MW production (i.e. 0.85 Mt) in 2024, i.e. 1.03% per annum (= 22.1% of the original share annually),*
- *Energy recovery from MW should increase in the years 2013 - 2024 from 11.6% of total MW production (i.e. 0.63 Mt) to 27.7% of total MW production (i.e. 1.47 Mt), i.e. 1.46% per annum (= 12.6% of the original share annually),*
- *Disposal of MW by landfilling should decrease in the years 2013-2024 from 49.6% of MW total production (i.e. 2.69 Mt) to 12.3% in 2024 of total MW production (i.e. 0.65Mt), i.e. 3.4% per year (= 6.8% of the original share annually) and*
- *Disposal of MW by incineration should remain in the years 2013-2024 at the level of 0.03% of MW production.*

Probably the most dynamic changes should take place in the period 2013-2024 in MMW management, which currently constitutes not only the most important weight component of MW, but also carries the greatest potential to achieve the changes required by the legislation and changes that are environmentally beneficial. Different pairs of graphs in Figures 23 and 24, respectively 25 and 26 correspond to the two concepts dealing with MMW: either using the potential hidden in the current MMW as it was produced in 2012, i.e. MMW is shown including components that can be diverted, or only as residual part of MMW, where MMW is considered only as unsorted mixed residue and the separated components are no longer presented as MMW (primarily, the efficiency of waste separation by citizens is expected to increase, nevertheless the diversion using mechanical or mechanical and biological waste treatment facilities is not excluded).

From the final forecasts of mixed municipal waste management (see Tables 24 to 27 and graphs on Figures 23 to 26) the following can be deduced:

- *Composting and anaerobic digestion of separable components of MMW should have in the years 2013-2024 a growing trend from forecasted 0.8% in 2013 to 10.1% in the year 2024, i.e. 0.9% per annum of potential MMW (= 105.7% of the original share annually), in the variant of MMW without separable components, composting of MMW then remains approximately zero,*
- *Material recovery of potential MMW (i.e. especially its separable components, because facilities for mechanical or mechanical and biological treatment are not assumed in the model) should increase in the years 2013 to 2024 from 1.2% in 2013 to almost 26.4% in the year 2024 from the total production of MMW from production forecast, i.e. 2.3% per annum (= 190.9% annually of the original share), in*

*the variant without separable components, the proportion of recovered material MMW will not change and remains almost zero,*

- *Energy recovery from potential MMW (i.e. in the variant with separable components) should increase from about 16.2% in the year 2013 to 42.7% in the year 2024, from total production of MMW from production forecasts, i.e. 2.4% per year (= 14.9% of the original share annually), in the variant MMW without separable components, energy recovery increases from 16.5% in the year 2013 to 69.6% in the year 2024, i.e. 4.8% per annum (= 29,3,7% annually of the original share),*
- *Disposal of potential MMW (i.e. in the variant with separable components) by landfilling should fall in the years 2013 to 2024 from 81.8% in the year 2013 to 20.8% in the year 2024 from the total production of MMW from production forecasts, i.e. 5.5 % per annum (= 6.8% annually of the original share), in the variant without separable components, decline is expected from 83.5% in the year 2013 to 30.4% in the year 2024, i.e. 4.8% (= 5.8% annually of the original share), and*
- *Disposal of MMW by incineration remains between the years 2013 to 2024 at a level of 0.03% of the production of MMW from production forecasts.*

The key element of most future changes in waste management in the Czech Republic, which is currently the only one that can lead in the medium term to some form of restriction or termination of landfilling of untreated waste, is the diversion of MMW from landfilling. This will be achieved by redirecting the MMW stream into more appropriate facilities, but also by a significant reduction in the production of residual MMW by separate collection at the source (citizens).

The waste management forecast model assumes an estimated potential capacity of facilities for energy recovery (see Table 21), which should be put into operation in the Czech Republic by the year 2024 according to this forecast, which will be utilized for energy recovery of MMW (1.26 Mt MMW in the year 2024) and at the same time will help to achieve the necessary reduction in landfilling.

This is primarily due to the need to reduce the amount of BDMW and MRW deposited at landfills as required by the Landfill Directive. This waste is currently landfilled in particular through MMW, of which it is an important part of.

The forecast defines the amount of MMW, which must be diverted in a separated form to a facility for material recovery respectively for composting or anaerobic digestion (MMW diversion from landfills amounts in the year 2024 to a total of 1.67 Mt, compared to the year 2012, while together with the new production it the amount of 0.03 Mt it will be distributed in the amount of 0.72 Mt for material recovery, 0.69 Mt for energy recovery and 0.30 Mt for composting).

The developed forecast of waste management assumes until the year 2024 an approximately linear decrease in the residual part of MMW to 63.5% of quantity from the year 2013, i.e. sorting of such quantity of waste, which exceeds one third of the current

MMW amount (in all, this represents 1.08 Mt of waste, which should be in the year 2024 sorted out of MMW compared to the situation in the year 2013, either by citizens or facilities for mechanical and biological treatment).

An important step towards achieving this goal is the introduction of compulsory collection of BDMW, which by itself is not sufficient. The usual experience after the introduction of a separate container collection of BDMW from citizens is an increase in the overall waste production, which results in only a small proportion of the diverted MMW of about 10%. Then in the final state in 2024 it will represent only 10.1% (i.e. 0.30 Mt), which corresponds to the empirical estimates of the effect of the diversion of BDMW from MMW using container collection.

The remaining 26.4% (i.e. 0.78 Mt) of the total potential production of MMW in the year 2024 (i.e. MMW including separable components), which will be necessarily diverted from the MMW stream (compared to the year 2013), is represented by *material recovery*, i.e. predominantly the diversion of paper, whose share in MMW continues to increase. (According to the comparison of experiences from pilot areas subject to repeated analysis of the composition of<sup>11</sup> MMW, by increasing the blue container collection grid density it is possible to achieve additional diversion of paper amounting to about 14% from MMW, beyond the already sorted paper and glass, plastics, and metals).

Additional room for reducing the amount of MMW therefore exists, and it is only a matter of approach, what proportion of the diverted 26.4%, compared with 2013, will consist of paper, plastic, glass and metals. In case that this distribution will correspond to the relative share of components in the current MMW, this represents a diversion of approximately 8.4% of MMW (i.e. 0.25 Mt) in the form of plastics, 12.9% of MMW (i.e. 0.38 Mt) in form of paper, 3.9% of MMW (i.e. 0.12 Mt) in the form of glass, and 1.1% of MMW (i.e. 0.03 Mt) in the form of metals.

An important role in reducing the amount of residual MMW should be in the future years played by the changes in legislation leading to improved design of products and their packaging, and generally the motivation of people to recycle.

It can be stated that the diversion of more than a *quarter (26.4%, i.e. 0.78 Mt) of MMW for material recovery* and approximately *one tenth of MMW (10, 1%, i.e. 0.30 Mt) in the form of separately collected BDMW* by the year 2024, compared to 2013, is realistic. However, the diversion of plastics, glass, and metals from MMW is also a critical point of the MW management forecasting model, whose fulfilment requires legislative changes leading to an increase in both positive and negative motivation (especially financial) of citizens to the responsible approach to the production and management of MW.

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<sup>11</sup> Kalina, J., Hřebíček, J. Comparison of MMW composition in Brno with other locations in the Czech Republic, Slovak Republic, and in Poland.

A crucial role in the management of BDMW will be played in the near future on the one hand by the introduction of mandatory collection of BDMW by citizens and on the other hand by promoting composting and anaerobic digestion, accompanied by suitable new construction of capacities (composting and biogas plants), which should provide up to 850 kt of composting BDMW in 2024. The current capacity of composting is unevenly distributed in the Czech Republic and will need to be constructed where such capacity is lacking.

From Tables 28 and 29 and graphs in Figures 28 and 29 it can be seen that the increase of about 19% in the quantity of BDMW (i.e. 0.4 Mt) occurs between the years 2013 and 2024 and also in material recovery of BDMW, excluding composting and anaerobic digestion, i.e. recycling mainly of paper and wood, whose energy recovery should be restricted, in view of the possibilities to materially recover such waste. Energy recovery of BDMW is not significant even at present, however, its decline should continue to the negligible quantity of 20 kt in the year 2024.

It can be seen from Table 30 that if the assumptions and basis of the management forecast will be fulfilled, then the requirements of the Landfill Directive will be achieved by the year 2020.

From the forecast of MRW management provided in Tables 31 and 32 and graphs in Figures 31 and 32, it can be seen that due to the fact that the forecasted production of MRW in the period 2013-2024 will decrease slightly, it will represent a significant decrease in the landfilling of MRW to 272 kt in the year 2024 (i.e. a decrease of 54% compared to the forecast for 2013) as well as a decrease in energy recovery from MRW (caused mainly by the diversion of materially recoverable components of MMW, whose energy utilization has been on the contrary increasing) to the resulting quantity of 54.1 kt (a decrease of 66.9% compared to the forecast for 2013). As in other cases, the disposal of MRW by incineration without energy recovery has been, is and will be for MRW insignificant in the Czech Republic.

From Table 33 it can be seen that if the assumptions and basis of the management forecast will be fulfilled, then the requirements of the Framework Landfill Directive regarding materially recoverable waste will be achieved by the year 2020.

## 2.6 Waste management policy in the Czech Republic

**Waste management policy of the Czech Republic is based on the general principles applied in waste management:**

- extended producer responsibility,
- polluter pays
- principle of self-sufficiency and proximity.



Waste management strategy of the Czech Republic for the period 2015 to 2024 is projected in the Waste management plan of the Czech Republic and the Waste prevention programme, which in accordance with the principles of sustainable development of the society set goals, principles, and measures that will be used as tools to influence consumer behaviour, waste producers and others.

Waste management strategy of the Czech Republic adopts the objectives and requirements of the European regulations.

WMP CR is the defining document for the development of waste management plans of the regions. Individual regions in the Czech Republic prepare their own strategies. WMP CR and also the waste management legislation are based on the principle of respecting the hierarchy of waste management.

Due to the fact that waste is also an important source of raw materials, the objectives, principles, and measures in WMP CR are linked to the Policy of secondary raw materials. WMP CR also reflects other important policies related to waste management.

## **2.6.1 Czech Republic policies related to waste management strategy**

- State Environmental Policy of the Czech Republic 2012-2020, which defines the plan for the implementation of effective environmental protection in the Czech Republic until the year 2020.
- Raw Material Policy of the Czech Republic 2012-2032. This document reflects the economic developments in Europe and in the world and the changes in global raw materials market. The document aims to ensure the raw material security of the state.
- Secondary raw materials policy of the Czech Republic – the basic vision of this document is "turning waste into resource." The document was created in order to create favourable conditions for the recovery of "secondary raw materials" from products and materials, which have completed their life cycle, and for their processing and recovery. The main objective is the replacement of primary natural resources by "secondary raw materials" and to contribute in this way to reducing material and energy intensity of production.
- Biomass Action Plan of the Czech Republic 2012-2020. The plan presents an analysis of the use of biomass in the Czech Republic for energy purposes and proposes appropriate measures for the sustainability of the connection between agriculture and energy sector until 2020.
- State Energy Policy of the Czech Republic 2012-2040. This is a strategic document defining the objectives of the state in energy management in accordance with the needs of economical and social development, including environmental protection, serving also for the development of territorial energy concepts.
- Strategy of regional development of the Czech Republic

The priorities taken into account in all national strategies presented above are waste prevention, assurance of maximum waste recovery, reduction of negative impacts on the environment and support of waste recovery as a substitute for natural resources, and as a source of energy.

## **2.7 Strategy and priorities of the Czech Republic in waste management for the period 2015 - 2024**

The strategy and priorities for further development of waste management are determined by the policy framework for the environment, the European requirements, obligations of the Czech Republic, the practical needs arising from the current state of waste management in the Czech Republic and the aspiration to get closer to the European recycling<sup>12</sup> society.

WMP CR and Czech waste management legislation are based on the principle of respect for the waste management hierarchy.

### **Waste management hierarchy:**

1. Waste prevention
2. Preparing for re-use
3. Waste recycling
4. Other recovery, e.g. energy
5. Waste disposal

The priorities of waste management address the major strategic objectives in the area of waste management (see the Binding part) and this hierarchy.

### **Main priorities of waste management in CR for the period 2015-2024:**

1. Waste prevention and reducing of hazardous properties of waste.
2. End-of-life product re-use.
3. Quality recycling and maximum recovery of suitable waste (material, energy, biological) and especially in relation to industrial segments in the regions (agriculture, energy, construction).
4. Optimizing the management of biodegradable municipal waste (BDMW) and other biodegradable waste (BDW) on the territory of the Czech Republic, with an emphasis on the compulsory introduction of separate collection of BDW.

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<sup>12</sup> The aspiration of the EU is to get closer to the "recycling society" through efforts to avoid waste and to use waste as a resource. In accordance with the hierarchy of waste management and the aim to create a recycling society, the Member States should encourage the use of recycled material, for example recyclable paper, and if possible, they should not support the landfilling or incineration of these recyclable materials. (Source: Waste Framework Directive 2008/98/EC).

5. Mandatory introduction of separate collection for waste consisting, at minimum, of the following: paper, metal, plastic, and glass by 2015.
6. Energy recovery from waste, municipal waste, particularly mixed municipal waste.
7. Substantial reduction of landfilling on the territory the Czech Republic.
8. Optimization of all activities in waste management with regard to the protection of human health and the environment.
9. Optimization of all activities in waste management with regard to the costs incurred and the economic and social sustainability.
10. Clarification of the state when waste ceases to be waste.
11. Ensuring the long-term stability and sustainability of waste management in the regions and in the Czech Republic.

**From these defined priorities it follows to:**

- Support separate collection, followed by recycling and recovery of materially recoverable components of municipal waste.
- Ensure sufficient capacity for material recovery of municipal waste and recovery of mixed municipal waste produced in the municipalities.
- Ensure biodegradable waste management especially mainly at the municipal level, from collection to final waste recovery/output products from facilities.
- Recover energy from municipal waste, particularly mixed municipal waste produced in the municipalities, in facilities provided for this purpose in accordance with the effective legislation.
- Ensure sufficient capacity for energy recovery of municipal waste, particularly mixed municipal waste produced in the municipalities.
- Improve the appropriate waste management systems of municipalities in the region.
- Provide information on the criteria set out at EU level, which must be met, so that specific substances or objects may be regarded as a by-product and not waste.
- Provide information on the criteria set by the EU for the state when waste ceases to be waste and methodically explain the procedures leading to the removal of the waste management mode.
- Determine national criteria for the condition where waste ceases to be waste, taking into account the current needs.
- Support in appropriate cases the emerging techniques<sup>13</sup> mentioned in particular in the Reference Document on Best Available Techniques<sup>14</sup> (BREF).
- Support processing facilities introducing certified environmental management systems EMS (Environment Management System) according to the international standard ISO 14001 or EMAS (Eco Management and Audit Scheme).

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<sup>13</sup> A novel technique for an industrial activity that could provide either a higher general level of protection of the environment or at least the same level of protection of the environment and higher cost savings than existing best available techniques (pursuant to Article 3, paragraph 14, Directive 2010/75/EU on industrial emissions).

<sup>14</sup> BREF - reference document on best available techniques, which describes the technique used, current emission levels and techniques considered for the determination of best available techniques (BAT) conclusions on BAT and emerging techniques for the industrial sector (pursuant to Article 3, paragraphs 11 and, 12 Directive 2010/75/EU on industrial emissions).

**To achieve these priorities, it is necessary to set the appropriate tools and measures** (see the Binding part of WMP CR).

To implement the defined priorities, activities were drawn up for the individual time periods:

**Short-term priorities and activities (mid 2015 to 2017):**

- New Waste Act will come into force, a new law on take-back of selected end-of-life products, new WMP CR for the period 2015 – 2024 will be announced, including Waste prevention programme until the year 2020, with a defined waste management strategy, objectives and actions to achieve them.
- The needs of expansion, modernization, and streamlining of regional and national networks for waste management will be assessed.
- New set of economic instruments in the context of waste management (landfilling fee, charging for MW waste management) will become effective.
- Small businesses will become a part of the municipal system for MW.
- Setting up a fully functional nationwide separate collection in municipalities in the Czech Republic (paper, plastics, glass, metals, and biodegradable waste - minimum of plant origin).
- Increasing the yield of separate collection of materially recoverable components in MW.
- Construction and commissioning of new facilities for waste management (e.g., final sorting lines, terminals, facilities for energy recovery from waste).
- Upgrading of existing facilities for waste management
- Increasing the share of material recovery of materially recoverable components in MW.
- Increasing the share of energy recovery of residual mixed municipal waste.
- Increasing the share of co-incinerated waste in facilities suitable for this purpose, in accordance with current legislation, in order to replace the primary sources.
- Link the BDMW agenda to the activities of the Ministry of Agriculture.
- Evaluation of the objectives of Directive 2008/98/EC on waste, for separate collection, for recovery of MW components, and objectives of Directive 1999/31/EC on Landfills for BDMW diversion from landfilling.

**Medium-term priorities and activities (from 2018 to 2019):**

- Evaluating the effectiveness of the landfilling charge as an economic tool for reducing landfilling.
- Evaluating the effectiveness of measures taken to fulfil the objectives of WMP CR, evaluation of the fulfilment of WMP CR objectives.
- Evaluating of BDMW diversion from landfilling, the role of facilities in the management of biodegradable waste, including the use of the output products from these facilities in relation to agricultural production. Potential adjustment of measures to achieve the objectives of the Landfill Directive.
- Evaluating of the real role of waste management facilities.
- Evaluating waste management systems set up in the regions.

### **Long-term priorities and activities (from 2020 to 2024):**

- Evaluation of the fulfilment of the objectives of WMP CR.
- Evaluation of fulfilment of objectives of the Landfill Directive and the effectiveness of the landfilling charge as an economic tool for limiting landfilling.
- Evaluation of the diversion of biodegradable waste from landfilling.
- Evaluation of meeting the objectives of the Waste Directive for the recovery and recycling of MW components.
- Evaluation of the overall development of waste management in relation to the environmental policy, energy and raw materials policy, and protection of human health in waste management.
- Evaluation of waste management systems at the regional and national levels and their contribution to the objectives of waste management.
- Economic evaluation of waste management.
- Evaluation of the objectives and benefits of waste prevention programmes in the Czech Republic.
- Establishing new priorities for further development of waste management in the Czech Republic.
- Development of the new WMP CR for the future period.

## **2.8 Development of waste management infrastructure**

The need for the development of infrastructure waste management facilities has been assessed, including new waste collection systems and additional waste management activities within the Czech Republic.

The objective which is outlined in the Binding part of WMP CR is the creation of a comprehensive and reasonably efficiently functioning network of waste management facilities at the national level and also the regional level, for more information see chapter 3.4 in the Binding part of this document.

The network will include groups of facilities of different capacities and importance, with regard to the incorporation of individual facilities into the waste management system (local, regional, trans-regional level).

Also, inter-regional cooperation will be taken into account in the utilization of facilities of inter-regional importance.

The basic structure, facility specifications, and their role in waste management systems are provided in Chapter 3.4.

### **2.8.1 Assessing the need for new collection systems**

The legal and factual conditions for the implementation of collection quota and subsequent material recovery of waste paper, plastic, glass, and metal, have now been created in the

Czech Republic. The Czech Republic has a dense network of locations for the separate collection of municipal waste components, which is still being extended.

It is assumed that the integrated collection system of materially recoverable municipal waste, including the packaging components will be preserved, and further development of this system will be supported. A stronger link between the collection networks and municipal systems of waste management is expected in handling of end-of-life products in the future.

The new legislation will have to define the conditions of separate collection in the communities.

The municipality will be required to determine the manner and provide space for separate collection of at least paper, plastics, glass, and metals from municipal waste to the extent that it would be sufficient to achieve the targets set by WMP CR in accordance with the Framework Waste Directive for the overall level of preparing for re-use and recycling of waste paper, metal, plastic, glass originating from household waste and waste of other origin, if their streams are similar to waste from households.

The municipality will also be required to determine the manner and provide space for the separate collection of biodegradable municipal waste of plant origin. Currently these collection systems have been introduced individually on selected sites throughout the Czech Republic, according to local conditions.

## **2.8.2 Waste management facility network**

Investments in facilities and other waste management infrastructure are crucial for future development. The largest direct public donor providing public financial support for subsidies has been for a long time the Czech State Environmental Fund (SEF). Through SEF activities and projects in the area of waste management were funded.

Expansion of the facility network was allowed also thanks to the financial support from the Operational Programme Environment (OPE) 2007-2013 within the implementation of EU structural support for the Czech Republic. OPE contributes to the objectives of WMP CR.

### **Facilities for municipal waste management supported by OPE in 2007 - 2013**

The projects that enabled the expansion and modernization of waste management infrastructure in Czech Republic were also carried out with the support of OPE 2007 - 2013 - Area of intervention 4.1 "Improvement of Waste Management" (EU Cohesion Fund). The quoted support area **has been allocated a total of 520258 million** EUR. The above completed projects will help to improve the state of waste management in the Czech Republic and will allow more consistent implementation of the waste management hierarchy.

Within the Area of intervention 4.1 "Improvement of Waste Management" OPE 2007-2013, the following types of projects or their combination could have been supported:

- integrated waste management systems:
  - a) regional system for mechanical and biological treatment (MBT) of MW,
  - b) facilities for energy recovery MW (WTEI).
- separate collection systems, storage, and handling of waste:
  - a) systems for the separation and local transportation of waste,
  - b) systems for the separation a local transportation of bio-waste,
  - c) collection yards,
  - d) MW terminals and depots,
  - e) systems for the separation of hazardous MW components,
  - f) systems for the separation of hazardous medical waste,
- facilities for the treatment or waste recovery, especially for sorting, processing and recycling of waste:
  - a) waste separation lines with additional technologies,
  - b) facilities for treatment or recovery of "other" waste,
  - c) facilities for energy recovery of medical waste,
  - d) facilities for the treatment of wrecked cars and recovery of spent oil,
  - e) facilities for the treatment electronic waste,
  - f) composting plants
  - g) biogas and bio-fermentation stations for processing bio-waste,
  - h) facilities for the management of hazardous waste (e.g. autoclaves, homogenizers, separators, thermal desorption, reactors, biodegradation facilities);
- reclamation of old landfills and elimination of illegal landfills:
  - a) rehabilitation of old landfills,
  - b) elimination of illegal landfills in specially protected areas (SPA), sites of European importance and bird areas.

At the time of preparation of this WMP CR, Area of intervention 4.1 "Improvement of Waste Management" OPE 2007-2013 announced **nine calls for individual projects** (up to 50 million EUR) and **one call for individual and large projects** (over 50 million EUR). The following calls were specifically involved: I, V, XI., XIX., XXVII., XL., XLV., LII., and LVIII. Following the amendment to WMP CR at the end of 2009, when it became possible to support facilities for energy recovery from municipal waste from public funds, a call could be announced also for their support (XV. call of OPE). This call also enabled support for the construction of facilities for mechanical-biological treatment (MBT) of municipal waste (MW). Thus a total number of ten calls of OPE 2007 - 2013 were announced to support projects in waste management. A list of all of the specific calls with their dates of publication and the period of their duration is shown below in Table 36.

Table 36: Calls for support OPE Intervention Area 4.1 "Improvement of Waste Management"

Call number	Period of Proposal Acceptance	Focus of the call	Allocation
I.	September 3 – October 26, 2007	All types of projects	Without allocation
V.	August 11 – October 10, 2008	All types of projects	Without allocation
XI.	August 3 – September 30, 2009	Bio waste, combined projects	1.5 billion CZK
XV.	January 4, 2010 – June 30, 2011	Energy recovery from waste, MBT	CZK 6 billion.
XIX.	May 3 – June 2, 2010	Bio waste, municipal waste, landfill reclamation projects, combined projects	1.5 billion CZK
XXVII.	May 16 – July 7, 2011	Municipal waste, bio waste	1 billion CZK
XL.	July 7 – September 20, 2012	Municipal waste, bio waste	Original allocation (1 billion CZK) was cancelled and supported all projects recommended for approval of about 1.7 billion CZK
XLV.	March 14 – April 4, 2013	Municipal waste, bio waste - only feasible quick projects	Without allocation
LII.	September 25, 2013 – January 15, 2014	Municipal waste, bio waste, landfill reclamation	Without allocation
LVIII.	March 5, 2014 – April 15, 2014	Municipal waste, bio waste - only projects without construction works and implementable by the end of 2015	1.5 billion CZK

Source: Ministry of the Environment

As of December 31, 2013, 1481 projects were supported from Priority Axis 4 with a total cost of 15 752 469 130 CZK (with eligible costs of 13 777 330 419 CZK). The amount of support for projects from the Cohesion Fund then represents 9 576 100 079 CZK. The largest share of these projects involved the improvement of quality of waste management. The construction of collecting yards, landfill reclamation, acquisition of facilities for waste treatment and other supported activities led not only to an increase in the proportion of recycled waste in the Czech Republic, but also to an increase the in share of recovered municipal waste in the Czech Republic. The increased number of collection yards, reclaimed areas of old landfills or the removal of three dumps from SPA helped to minimize negative effects on human health and the environment, and also improved the recovery of waste as a replacement for primary natural resources.



The OPE call no. XV. was opened, as mentioned above, to invite applications for the construction of MBT MW and WTEI. At the time of WMP CR preparation, three projects were approved under this call for the funding of construction of MBT MW with a total capacity of 160 thousand tonnes per year. None of these projects, however, has yet reached the final stage and has not yet been realized and financed from OPE. An overview of the above projects with a total estimated cost is provided in the following Tables no. 37 and no. 38

Table no. 37: Number and financial summary of approved projects under PA 4.1 OPE implemented in calls I. - XLV (excluding OPE call XV. (Status as of December 31, 2013)

According to the type of project	Supported projects			
	Number of projects	Total costs	Eligible costs	Requested aid (FS)
Collecting yards	309	2 781 949 612	2 590 015 112	2 182 807 788
Separate collection systems	501	2 138 696 538	1 847 747 965	1 351 095 806
Other facilities	247	5 082 039 421	4 202 304 924	2 271 495 683
Composting plants and biogas stations	262	2 635 044 925	2 183 079 148	1 488 441 181
Reclamation and removal of landfills	70	1 758 564 407 11	1 742 312 207	1 477 032 490
Combined projects	92	1 356 174 1227	1 211 871 063	805 131 131
<b>TOTAL</b>	<b>1 481</b>	<b>15 752 469 130</b>	<b>13 777 330 419</b>	<b>9 576 100 079</b>

Source: Ministry of the Environment

Table 38: Projects for the construction of MBT in preparation

Project name	Total project cost	Support by Cohesion Fund	Capacity (t/year)
Waste Management Centre Radim III - MBT with biogas station	718 468 066	233 834 642	75000
MBU - Ecological Centre Mníšek pod Brdy	302 786 014	85 789 371	40000
Centre for industrial processing of municipal waste Mladá Boleslav	591 845 838	1 52 925 404	45000

Source: Ministry of the Environment

Below is a brief list of potential support beneficiaries (examples):

- natural person authorized to do business and legal persons,
- local government entities and their associations,
- government departments and their directly managed organizations,

- legal entities created by the state for these purposes,
- state enterprises,
- organizations co-financed by the stat,
- civic associations and churches,
- foundations and endowment funds,
- organizations established under a special law.

## **OPE programming period 2014 - 2020, Priority Axis 3: Waste and material streams, environmental liabilities and risks**

The new OPE 2014 – 2020 is a direct continuation of OPE 2007-2013. In the new programming period projects will be co-financed under Priority Axis 3 "Waste and material streams, environmental contamination and risks", from the thematic objective no. 6 "Protecting the environment and promoting efficient use of resources", and this again from the Cohesion Fund. The Priority Axis 3 (Part Waste) is subdivided into three specific objectives (see below). Newly co-financed from OPE will also be projects promoting waste prevention and projects directly aimed at reducing the impact of hazardous waste production on the environment in the Czech Republic.

The priorities of project support in waste management are determined especially by WMP CR and also newly by the Programme of waste prevention of the Czech Republic.

### **Examples of supported projects within each specific objective**

#### **Investment Priority 1**

- **3.1 "Waste prevention"**
  - Supporting the implementation or upgrading of technologies resulting in lower quantity of waste produced per unit of product, primarily addressing the waste management of the given facility.
  - Building of sites for municipal waste prevention.
- **3.2 "Increase share of materially and energy recovered waste"**
  - construction and modernization of facilities for the collection, sorting, and waste treatment,
  - supplementing separate collection systems, storage and handling of waste,
  - building of new and upgrading of existing collection yards,
  - sorting and final sorting lines providing quality raw material output and lines with associated technologies,
  - supplementing depots and storage for MW and its separated components and for other waste that are not from the hazardous category,
  - building of systems for separate collection of bio-waste,

- support and development of the system of collection, concentration, and management of hazardous and medical waste,
  - building of composting plants using compost mainly on agricultural land,
  - building of collection and local transportation of gastronomy waste/kitchen waste
  - supplementing collection system for end-of-life products,
  - construction and modernization of facilities for waste material recovery,
  - facilities for the treatment or recovery of "other" waste
  - processing technology for construction insulation systems components (e.g. processing of construction polystyrene, construction elements of PVC),
  - construction of facilities for energy recovery of municipal waste (WTEI),
  - equipment for thermal waste treatment,
  - construction of biogas plants for bio-waste processing,
  - facilities for heat-treating medical and hazardous waste, or their modernization,
  - facilities for handling hazardous waste, or their modernization,
  - reconstruction of co-incineration facilities,
  - installation of boilers for waste incineration in heating plants.
- **3.3 "Remove illegal landfills and reclaim old landfills"**
    - reclamation of old technically unsecured landfills, in operation before the enforcement of Act no. 238/1991 Coll.

## **2.9 Evaluation of existing approaches and measures in waste prevention**

The subject of waste prevention or prevention covers a very wide scope and affects the general societal space.

The Directive of the European Parliament and Council 2008/98/EC on waste, requires that the Member States prepare Waste prevention programmes (hereinafter the "Programme"). Some Member States of the European Union have implemented prevention approaches in their countries (waste prevention programmes) much earlier than required by the Waste Directive.

Also, the Czech Republic has been pursuing this subject for a long time. In the current WMP CR (Government Decree no. 197/2003 Coll.), in chapter 3.1, the preventive measures are defined. Waste prevention is in the first place in the waste hierarchy and is therefore a part of the Waste Act. The implementation of the preventive measures provided for in the so far effective WMP CR was regularly evaluated.

## 2.9.1 Current state in the Czech Republic and fulfilment indicators of preventive measures

The existing defined measures in this area are provided in Government Decree no. 197/2003 Coll., on Waste management plan, in chapter 3.1. Measures to prevent waste, reduce its quantity and hazardous properties. The chapter contains 12 separate measures (points A - L).

According to the evaluation, the preventive measures of WMP CR fulfilled without reservation were as follows:

- a) To initiate and support by all available means changes in the production processes towards low-waste to no-waste technologies and if waste is generated, its improved recovery.
- c) Replace, assuming that it is technically and economically feasible, hazardous materials and components used as raw materials by less dangerous alternatives.
- d) Minimize the volume and weight of products while maintaining their functional properties.
- e) Create conditions to promote returnable reusable packaging.
- f) Support by all available means the introduction of environmental management systems, especially of the International Organization for Standardization, the National programme for implementation of company management systems and audits from the perspective of environmental protection.
- h) Strive at all levels of public administration to implement effective changes in waste management leading to improved quality control and accountability in decision making.
- i) Strive to change the behaviour of businesses and civic society toward favouring friendly products in terms of their impact on human health and the environment.
- j) Implement the programme of environmental education and awareness in the field of waste management, including improved public access to information about the state of waste management.
- k) Encourage all forms of voluntary activities in manufacturing and non-manufacturing sector.

Fulfilled with caveats were:

- b) Develop analyses regarding the possibility of substituting materials and products that may have an adverse effect on health of people and the environment during recovery or disposal following their end-of-life.
- g) Use within the individual sectors the National Cleaner Production programme and the SEF programmes for the dissemination and promotion of preventive practices to reduce waste and their hazardous properties.

Fulfilled were:

- l) Develop implementation programmes for the Czech Republic for specific groups of waste on the basis of analyses developed within this plan.

Prevention of hazardous waste is also addressed in point 3.2, letter e) – checking of products and equipment in connection with reducing their dangerous properties throughout their life cycle, and in point 3.2, letter f) - public motivation for separate collection of hazardous components of MW. The support for sorting of individual components of municipal waste and take-back of selected products is ensured by item 3.4, letter l).

Most of these existing measures for waste prevention focus more on the industry and production than on municipal waste and the citizen.

In the industry waste prevention works naturally. The owners (operators) try to achieve maximum economic effectiveness in the manufacturing process. The industries positively perceive information about low waste technologies and best available techniques and the possibilities to implement them.

The second area is the municipal sector (municipal waste). In this area the preventive approaches offer much more potential and specific efforts are directly focused on the citizen.

The principles of many measures set out in the current WMP CR are also incorporated into the new WMP CR (Programmes of waste prevention).

From the existing waste management indicators, in direct connection with the performance targets for waste prevention is the indicator: I.1- Total waste production 1000 tons /year, I.2 - Total waste generated per unit of GDP t/1000 EUR/year, I.3 - Share of total waste production % of total waste production, and I.4 - Production per inhabitant kg/inhabitant/year.

To evaluate the preventive measures only by the numerical values of production, however, is misleading.

In the future it will be necessary to find and define the best indicators for this area.

Among the more contemporary and appropriate evaluation criteria are: numbers of completed research projects and research and development projects (R & D) relating to waste prevention, the number of projects implemented with the support of the Operational Programme Environment and the State Environmental Fund, the number of cleaner production projects, the number of product categories in the National Programme for eco-labelling and the number of valid licenses for the use of eco-labels (EFP, ESS, EU Eco), the number of guidelines in the different areas of prevention, the amount of financial resources spent on research, development and support, and more.

Qualitative and quantitative criteria should always be established with regard to specific measures, the Programme will then be easier to monitor and the evaluation process itself should have a higher information value.

## 3. Binding part

The Binding part of the Waste management plan of the Czech Republic represents the mandatory basis for the processing of waste management plans of the regions and for decision-making and other activities of the relevant administrative authorities, regions and municipalities in the area of waste management.

The binding part reflects the strategy and prioritization of development of waste management for the upcoming period.

The binding part contains the objectives, principles, and measures that take into account environmental policy of the Czech Republic, European commitments of the Czech Republic and the needs of the current waste management in the Czech Republic. The binding part of the Waste management plan of the Czech Republic, is based on the principle of respect for the waste management hierarchy (hereinafter the "hierarchy").

### 3.1 Strategic waste management objectives of the Czech Republic for the period 2015-2024

1. **Prevention and reduction of specific waste production.**
2. **Minimizing of adverse effects of waste generation and waste management on human health and the environment.**
3. **Sustainable development of the society and moving closer towards the European "recycling society".**
4. **Maximum utilization of waste as a substitute for primary sources and the transition to the circular economy.**

### 3.2 Waste management principles

In order to meet the strategic objectives of the Czech Republic waste policy, it is necessary to embrace the principles of waste management.

#### **Principles:**

- a) Prevent waste through the fulfilment of the "Programme for waste prevention" and other measures to promote reduction of waste.
- b) Apply **the waste management hierarchy** in waste management. Manage waste according to the following ranking: prevention, preparation for re-use, recycling, other recovery (e.g. energy recovery), and last - disposal (safe disposal), and that in compliance with all requirements, laws, standards and rules to ensure the protection human health and the environment.

In applying the hierarchy, support the options that deliver the best overall result from the environmental perspective. Take into account the entire life cycle of products and materials, and focus on reducing the impact of waste disposal on the environment.

- c) Support waste management methods, which use waste as a source of raw materials, replacing primary natural resources.
- d) Support waste management, which leads to an increased economic utilization of waste.
- e) Support preparing for re-use and recycling.
- f) Do not support landfilling or incineration of recyclable materials.
- g) For specific waste streams, a deviation may be allowed from the established hierarchy of waste management, if it is justified by taking into account the total life cycle impact of this waste and its management.
- h) In applying the hierarchy to reflect the precautionary principle and prevent the adverse impacts of waste management on human health and the environment.
- i) In applying the hierarchy reflect the principle of sustainability, including technical feasibility and economic sustainability.
- j) In applying the hierarchy ensure the protection of raw materials resources, the environment, and human health with regard to economic and social impacts.
- k) The individual types of waste management in the Czech Republic must create an integral complex which guarantees minimum negative impacts on the environment and high level of protection of human health.

## **3.3 Management principles for selected types of waste**

### **3.3.1 Priority waste streams**

The below proposed objectives, principles, and measures are based on the requirements of the European legislation, particularly the provisions of the Framework Waste Directive, the Packaging Directive, the Directive on end-of-life products (electrical and electronic equipment, batteries and accumulators, cars) and the Landfill Directive and comply with the valid waste hierarchy.

When establishing the principles, objectives and measures, the priorities of waste management in the Czech Republic with regard to its status and possibilities were taken into account.

#### **3.3.1.1 Municipal waste**

In order to meet the objectives of the European Directive 2008/98/EC on waste, meet the defined objectives and targets.

## Objectives and Targets:

- a) By the year 2015 **introduce separate collection** at least for waste consisting of **paper, plastics, glass and metals**.
- b) By the year **2020, increase to at least 50% by weight, preparing for re-use and recycling** at least for such waste consisting of materials such as **paper, plastic, metal, and glass** originating from households, and possibly waste of other origin, if such waste streams are similar to waste from households.

The targets are based on Directive 2008/98/EC on waste.

The method of monitoring the targets will be determined in accordance with the applicable EU<sup>15</sup> legislation.

Table 39: For target b) the establishment of intermediate values in the specified years is proposed.

Year	Target
<b>2016</b>	<b>46%</b>
<b>2018</b>	<b>48%</b>
<b>2020</b>	<b>50%</b>

## Principles:

- a) Maintain, support and develop an independent separate commodity collection system (paper, plastic, glass, metal, drink cartons) with respect to the targets set for each material, with respect to the higher quality of thus collected waste.
- b) Maintain and develop the availability of separate collection systems for recoverable waste in the municipalities.
- c) Ensure (establish) obligatory separate (sorted) collection of recoverable components of municipal waste, at least of paper, plastics, glass, and metals, in the municipalities.
- d) The collection system of municipal waste in the community is established by municipality with regard to the requirements and the availability of technological waste processing. The collection system is established by the municipality under independent competence by a generally binding regulation.
- e) The scope and method of separate collection of components of municipal waste in the community is defined by the municipality with regard to technical, environmental, economic, and regional possibilities, and conditions for further processing waste; the separate collection must be sufficient to ensure the objectives of the Waste management plan for municipal waste.

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<sup>15</sup> Commission Decision 2011/753/EU of 18 November 2011, establishing rules and calculation methods for verifying compliance with the targets provided in Article. 11, paragraph 2 of the Directive of the European Parliament and Council Directive 2008/98/EC.



- f) The municipality is obliged to comply with the waste hierarchy, i.e. preferably offer the waste for recycling, then for other recovery, and only if the waste may not be recovered, transfer it for disposal. This hierarchy may be deviated from only in justified cases in accordance with the applicable legislation and if it does not endanger or harm the environment or human health, and when the procedure is in accordance with waste management plans.
- g) Prioritize environmentally beneficial, economically and socially sustainable municipal waste treatment technologies.
- h) Maintain and develop participation and cooperation with producers of packaging and other manufacturers under the principle of "polluter pays" and "extended producer responsibility" for ensuring collection (take-back) and recovery of appropriate components of municipal waste.
- i) Before changing the system of collection and municipal waste management on nationwide scale, always perform a thorough analysis including environmental, economic, and social aspects and subject it to a comprehensive discussion of all parties concerned.
- j) Processing of mixed municipal waste by sorting may be supported as a complementary technology of waste processing prior to material and energy recovery. This processing does not replace the separate collection of recoverable components of municipal waste.

#### **Measures:**

- a) Enact the obligation and conditions of separate collection of municipal waste in municipalities.
- b) Monitor consistently the function of separate collection of recoverable components of municipal waste, at least for paper, plastics, glass, and metals.
- c) Consistently monitor compliance with the hierarchy of waste management.
- d) Continuously evaluate the municipal system for municipal waste management and its capacity and propose measures for its improvement.
- e) Classify sorted waste, collected by a separate collection in municipalities as municipal waste (containing packaging components), i.e. as group of 20 of the Waste catalogue.
- f) Establish by legislation the conditions under which deviations from waste hierarchy may occur. These conditions should predominantly comply with environment and health protection; take into account the overall life cycle of waste and its environmental impact, technical feasibility, economic sustainability, and social impact.
- g) At the community level, inform once a year the citizens and other participants in the municipal system of municipal waste management, on the manner and extent of separate collection of municipal waste, recovery and disposal of municipal waste, and waste management of other waste in the municipal system. This also includes information about how to prevent and minimize the generation of municipal waste. At least once a year to publish the quantified results of community waste management.
- h) Regularly evaluate the system of municipal waste management at local and regional level.

### 3.3.1.1.1 Mixed municipal waste

Mixed municipal waste is waste classified according to the Waste Catalogue under the code 200301 and for the purpose of setting targets it is defined as residual waste after sorting of materially recoverable components, hazardous substances, and biodegradable waste that will be recovered.

Fulfil:

#### **Objective:**

- a) **Use mixed municipal waste** (after sorting of materially recoverable components, hazardous substances and biodegradable waste) **especially for energy recovery in facilities designed for this purpose in accordance with effective legislation.**

#### **Principles:**

- a) Significantly reduce landfilling of municipal waste.
- b) Reduce the production of mixed municipal waste by the introduction or extension of separate collection systems for recoverable components of municipal waste, including biodegradable waste.

#### **Measures:**

- a) Establish by legislation the possibilities and conditions for energy recovery of mixed municipal waste, especially in relation to the Framework Directive on Waste and the applicable energy efficiency of facilities therein, and with regard to the protection of the atmosphere.
- b) Continuously adjust the fee for recoverable municipal waste landfilling so that the amount disadvantages landfilling of such waste streams that will be banned from 2024 from landfilling, in accordance with the waste hierarchy, including mixed municipal waste, and that with regard to waste management adaptation to external conditions such as European Union legislation, the application of new technologies, competitive environment, etc., while maintaining a high degree of diversification and market principles with an equal measure of costs for waste producers, and with regard to the social acceptability for citizens.
- c) Classify mixed municipal waste as waste, which is expected to be prohibited from landfilling from the year 2024.
- d) Support the building of a correspondingly effective infrastructure needed to ensure and increase energy recovery of waste (especially mixed municipal waste.)
- e) On an adequate level recover energy from mixed municipal waste in facilities for energy recovery of waste without its prior treatment, or after its treatment by subsequent incineration/co-incineration, under compliance with applicable laws.
- f) Continuously evaluate the system of management of mixed municipal waste at municipal and regional level.

### **3.3.1.2 Waste from small enterprises**

For the purpose of economically balanced municipal waste management in municipalities and to ensure compliance especially with the provisions of the Framework European Waste Directive for the separate collection of waste consisting at least of paper, plastic, glass, metal and with the recycling targets of the Waste Directive, accept and abide by:

#### **Principles:**

- a) Provide to the small enterprise producers of waste, i.e. legal entities and natural persons authorized to business, producing municipal waste in the municipality (small enterprises, non-industrial manufacturing sector entities, administration, services, and trade) an opportunity to participate in the municipal waste management within the municipality, if the municipality has established a system of municipal waste management which includes waste from small enterprises.
- b) In communities, within the framework of municipal waste management system, establish also waste management for waste produced by legal entities and natural persons authorized to do business participating in the municipal system of municipal waste management. Establish a method for collecting the individual types of waste, but at minimum for a separate collection of paper, plastic, glass, metal, biodegradable waste, and mixed municipal waste produced by legal entities and natural persons authorized to do business participating in the municipal system of municipal waste management.
- c) Impose a charge on entrepreneuring legal entities and natural persons authorized to do business for the participation in the municipal system of municipal waste management.
- d) In municipal waste management, the participating legal entities and natural persons authorized to do business will apply principles in accordance with the hierarchy of waste management to municipal waste management.
- e) Allow the municipalities to engage in their systems of waste management the legal entities and natural persons authorized to do business according to the possibilities and capacity of the system.

#### **Measures:**

- a) Enact the possible participation of legal entities or natural persons authorized to do business in municipal systems of waste management.
- b) Continuously evaluate the municipal system for municipal waste management in connection with the possibility to engage in the municipal system of municipal waste management the legal entities and natural persons authorized to do business involving municipal waste which they produce.
- c) At the community level allow the setting of criteria e.g. the maximum limit on municipal waste, whose fulfilment will enable legal persons and natural persons authorized to do business to participate in the local municipal waste management system in the community by municipal waste they produce.

- d) Regularly evaluate the criteria referred to in paragraph c) and modify them according to the current conditions in the community.
- e) Extend supervisory powers of municipalities, especially sanctions upon legal entities and natural persons illegally using the municipal system of municipal waste management.
- f) Allow by introducing appropriate legislation the cooperation of communities with trade licensing authorities in order to improve the possibilities of supervision of legal persons and natural persons authorized to do business operating within the territory of the municipality.
- g) Simplify obligation to keep records of waste by legal entities and physical persons authorized to do business participating in the municipal system of municipal waste management.
- h) At the community level, inform in an appropriate form at least once a year the legal entities and natural persons authorized to do business and participants in the municipal system of municipal waste management on the arrangements and scope of separate waste collection and management.

### **3.3.1.3 Biodegradable waste and biodegradable municipal waste**

In order to meet the objectives of the European Directive 1999/31/EC on landfills, i.e. the reduction of the quantity of biodegradable municipal waste deposited at landfills attain:

#### **Target:**

- a) **Reduce the maximum quantity of biodegradable municipal waste deposited at landfills** in such a way, so that the share of this component would be in the year **2020 at maximum 35%** by weight of the total quantity of biodegradable municipal waste produced in 1995.

#### **Principles:**

- a) Establish a mandatory system of separate collection of biodegradable waste and its waste management, at least for biodegradable waste of plant origin in the communities
- b) Support and develop the system for the collection of biodegradable municipal waste.
- c) Support maximum recovery of biodegradable waste and the products from their processing.
- d) Support the creation and development of the infrastructure necessary to ensure the recovery of biodegradable waste.

#### **Measures for the management of biodegradable municipal waste and other biodegradable waste:**

- a) Define the terms in this area by legislation.
- b) Determine properties and requirements for the collection and management for each group of biodegradable waste.

- c) Enact the obligation of municipalities to establish by a generally binding municipal ordinance the collection system, separate collection, and management of biodegradable waste in the municipality, at least for biodegradable waste of plant origin, and also the obligation of municipalities to designate places where physical persons and waste producers participating in the municipal system may separately deposit biodegradable waste, at least biodegradable waste of plant origin.
- d) Enact the obligation of physical persons and waste producers participating in the community system to separately collect, sort, and transfer for recovery biodegradable waste using the system provided by the municipality, unless they recover the waste themselves in accordance with the Waste Act.
- e) Enact the obligation of municipalities to establish by a generally binding municipal ordinance the system for the collection and separate collection of paper, and the obligation of municipalities to designate places where physical persons and waste producers participating in the municipality system may deposit paper they have produced as waste.
- f) Enact the obligation of individuals and waste producers participating in the municipality system to separately collect, sort, and transfer for recovery paper, using the system provided by the municipality, unless they recover the waste themselves in accordance with the Waste Act.
- g) Base the system on the technical possibilities and recovery options of biodegradable waste in the community in relation to the municipal waste management in the region. Whereas the mechanical and biological treatment and energy recovery of biodegradable components contained in mixed municipal waste does not replace the obligation of municipalities to establish a system for the separate collection of biodegradable waste and its subsequent recovery.
- h) Consistently monitor the separate collection of biodegradable waste.
- i) At the community level, inform once a year the citizens and other stakeholders in the municipal system of municipal waste management on the manner and extent of separate collection of biodegradable waste and its management. This also includes information about the prevention and minimization possibilities of biodegradable waste. Publish at least once a year the quantified results of community waste management.
- j) Technically support and promote by awareness campaigns household, community, and municipal composting of biodegradable waste for physical persons. It is recommended to include the programme of support of household, community, and municipal composting and its implementation in collaboration with communities in the Regional waste management plans.
- k) Encourage the construction of facilities for aerobic decomposition, anaerobic digestion, energy recovery, and preparation for energy recovery of biodegradable waste. Create an adequate network of these facilities in the regions to manage separately collected biological degradable waste from municipalities and from other producers, including sludge from wastewater treatment plants.
- l) Establish minimum requirements for technologies for processing biodegradable waste and for the characteristics of output products to achieve high recovery products and satisfy all requirements to protect human health and the environment.

- m) Promote the use of composts made from biodegradable municipal waste, i.e. the biological waste obtained from separate collection of biodegradable municipal waste, for the application to the soil. Create conditions for the consumption of the final products from the processing of separately collected biodegradable waste, i.e. the compost and digestate, primarily for use in agricultural production and in the community.
- n) In cooperation with the Ministry of Agriculture encourage farmers to partially replace industrial fertilizers by fertilizers made from waste that meet qualitative requirements for conventional fertilizers.
- o) Introduce legislation to facilitate and support energy recovery from biodegradable waste included in mixed municipal waste, which is generally because of the heterogeneity of the material and the concentration of hazardous substances and elements not suitable for direct composting, by processing it in biogas stations or processing by other biological treatment methods.
- p) Support the construction of facilities for energy recovery of mixed municipal waste.
- q) Support energy recovery of mixed municipal waste in facilities for energy recovery of waste without prior treatment, or after its treatment by subsequent incineration/co-incineration complying with applicable laws.
- r) Thoroughly inspect the operation of the facilities for the processing and recovery of biologically degradable waste operated in the area of waste landfills to avoid landfilling of this waste, which is banned from landfilling.
- s) Carefully supervise the waste management of catering waste and of animal by-products in accordance with the Regulation of the European Parliament and Council (EC) no. 1069/2009.
- t) Introduce legislation enabling the recovery of biodegradable waste similar to purposefully grown biomass (e.g. green waste from lawn mowing, etc.) in agricultural biogas plants.
- u) Regularly evaluate the management system of biodegradable waste at the regional level.
- v) Continuously adjust the fee for the landfilling of municipal waste so that the amount makes landfilling of recyclable and recoverable waste streams disadvantageous, in accordance with the hierarchy of waste management, including those containing a biodegradable component, and that with regard to waste management adaptation to external conditions such as European Union legislation, the application of new technologies, competitive environment, etc., while maintaining a high degree of diversification and market principles with an equal measure of costs for waste producers with regard to the social acceptability for citizens.
- w) Enact a ban on landfilling of mixed municipal waste, recyclable, and recoverable waste from the year 2024.
- x) Ensure quality data base describing the production of biodegradable waste and its waste management, including data on facilities processing biodegradable waste.
- y) For agricultural<sup>16</sup>waste,<sup>17</sup> promote their processing by technologies such as anaerobic digestion (digestion, fermentation), aerobic decomposition (composting) or other biological methods.

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<sup>16</sup> Decree no. 341/2008 Coll., on details of biodegradable waste management.

- z) Establish by legislation the parameters for outputs from facilities processing organic waste, which will be used in the environment.

### **3.3.1.4 Construction and demolition waste**

In order to meet the recycling target of the European Framework Waste Directive and to move closer towards the "recycling society", ensure:

#### **Target:**

- a) **Increase by the year 2020, to at least 70% by weight, the rate of preparing for re-use and the rate of recycling of construction and demolition waste** and other types of their material recovery, including backfilling, in which materials are replaced in accordance with the applicable legislation by construction and demolition waste of the category "other", excluding the naturally occurring material defined in the Waste Catalogue<sup>18</sup> under the catalogue number 17 05 04 (soil and stones).

The target is based on the directive of the European Parliament and Council Directive 2008/98/EC on waste.

#### **Principles:**

- a) To regulate the production of construction and demolition waste management with regard to the protection of human health and the environment.
- b) Implement maximum recovery of processed construction and demolition waste and recycled materials from construction and demolition waste.

#### **Measures:**

- a) Enact conditions to manage the production of construction and demolition waste and conditions for their management and thus minimize hazardous constituents and properties, preferably ensure construction and demolition waste recovery and recycling and ensure high quality of recycled output.
- b) Follow the European Union's legislation in the area of "end of waste", and if a relevant legislative document is not provided at the European Union level, then draw up a document precisely defining the transition of recycled construction and demolition waste into a product.
- c) Enact standards for the quality of material from recycled construction and demolition waste.

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<sup>17</sup> Decree no. 381/2001 Coll., laying down the Catalogue of Wastes, List of Hazardous Wastes and lists of wastes and countries for the purpose of export, import and transit and the procedure for granting permission for export, import and transit of waste (the Waste Catalogue).

<sup>18</sup> Decree no. 381/2001 Coll., laying down the Catalogue of Wastes, List of Hazardous Wastes and lists of wastes and countries for the purpose of export, import and transit and the procedure of granting permission for export, import and transit of waste (Waste Catalogue).

- d) Ensure mandatory use of recycled materials meeting the respective construction standards, as a substitute for natural resources in construction activities financed from public funds, if technically and economically possible.
- e) Prevent the use of unprocessed construction and demolition waste, with the exception of excavated soil and spoil material without dangerous properties.
- f) Simplify the rules for the use of processed construction and demolition waste and recycled materials from this waste on ground surface while maintaining a high level of environmental and human health protection.
- g) Define by legislation the range of construction and demolition waste types suitable for use on ground surface.
- h) Develop a waste management document for waste that will arise in the future within the construction waste commodity - plastic windows, insulation materials, insulation of buildings, etc. to target their maximum recovery.

### **3.3.1.5 Hazardous waste**

In order to minimize the adverse effects of hazardous waste and its waste management on human health and the environment, ensure:

#### **Objectives:**

- a) **Reduce the specific production of hazardous waste.**
- b) **Increase the share of materially recovered hazardous waste.**
- c) **Minimize the negative effects of hazardous waste management on human health and the environment.**
- d) **Remediate contaminated sites with hazardous waste presence.**

#### **Principles:**

- a) Support the production of products so as to limit the formation of non-recoverable hazardous waste and thereby reduce the risk with regard to the protection of human health and the environment.
- b) Dispose of hazardous waste in accordance with the hierarchy of waste management.
- c) Promote technologies for recycling and recovery of hazardous waste and technologies for reducing hazardous waste properties.
- d) Rigorously investigate whether the processed hazardous waste actually lost hazardous properties, so that these properties are not manifested.
- e) Do not use hazardous waste and hazardous waste, which ceased to be waste, on ground surface.
- f) Tighten conditions for the recovery of hazardous waste as technological material for technical landfill closure.
- g) Reduce the amount of hazardous waste in mixed municipal waste.



## **Measures:**

- a) Continuously evaluate the system of hazardous waste management at the regional level.
- b) Motivate the public to implement the separate collection of hazardous components of municipal waste.
- c) In cooperation with relevant authorities carry out effective public awareness campaigns on the impact of hazardous properties of waste on human health and the environment, including drawing up of methodologies.
- d) Increase, if necessary, the number of facilities for the recovery of hazardous waste and waste treatment facilities for the reduction and elimination of hazardous properties.
- e) Establish a support system for the construction of new innovative technologies and modernization of existing technologies for the recovery and treatment of hazardous waste.
- f) Establish in cooperation with the Ministry of Industry and Trade a support system for innovative manufacturing technologies aimed at reducing the quantity of hazardous waste generated and waste production of technological processes.
- g) Support safe remediation of environmental liabilities.
- h) Revise and set the fee for landfilling of hazardous waste at an appropriate level with regard to real economic status of waste management.
- i) Rigorously monitor the quantity of hazardous waste used as technological material for landfill closure.
- j) Implement legislation setting stricter conditions for granting authorization for the evaluation of hazardous properties of waste - test of professional expertise.
- k) Implement legislation establishing the qualifications of the person taking samples of hazardous waste intended for tests demonstrating the properties of the waste.

### **3.3.1.6 End-of-life products with take-back arrangement**

Reflect the responsibility of the manufacturer of selected products in accordance with the „polluter pays" principle involving financial responsibility for waste consisting of end-of-life products, ensuring take-back of the products, comply with environmentally sound management of product waste, comply with the European Union law.

To meet the objectives, targets and requirements of the relevant end-of-life product directives and to move the Czech Republic closer to a "recycling society", in order to improve the management of the following groups of waste and to minimize their adverse effects on human health and the environment, adopt objectives, targets and measures for the following groups of products at their end-of-life.

#### **3.3.1.6.1 Packaging and packaging waste**

In order to meet the recycling targets of European Directive 2008/98/EC on waste and meet the recycling and recovery targets set by the European Directive on 94/62/EC, ensure and achieve:

**Targets:**

- a) Increase **the overall packaging recycling to the level of 70% by the year 2020.**
- b) Increase **the overall recovery of packaging waste to the level of 80% by the year 2020.**
- c) Increase **the recycling of plastic packaging to the level of 50% by the year 2020.**
- d) Increase **the recycling of metal packaging to the level of 55% by the year 2020.**
- e) Achieve **55% overall recovery of consumer sale packaging by the year 2020.**
- f) Achieve **50% recycling of consumer sales packaging by the year 2020.**

Achieve targets set out in Table no. 40.

Table 40: Targets for recovery and recycling of packaging waste.

<b>Indicator:</b>												
Recycling - The quantity of recovered waste packaging, relative to the sum of quantities of one-way packaging placed on the market and the quantity of waste generated from reusable packaging.												
Overall recovery - Overall quantity of packaging waste recovered, relative to the sum of quantities of one-way packaging placed on the market, and the quantity of waste generated from reusable packaging. Recycling is included in the recovery rate as one of its forms.												
Recycling of consumer sale packaging - The quantity of materially recovered waste from packaging obtained by the collection from consumers (households), relative to the quantity of sales of one-way packaging placed on the market or put into circulation, after the deduction industrial packaging.												
Overall recovery of consumer sale packaging - the overall quantity of recovered waste from packaging obtained by the collection from consumers (households), relative to the quantity of sales of one-way packaging placed on the market or put into circulation, after deduction of industrial packaging.												
A: recycling			B: overall recovery									
Packaging waste	By December 31, 2015		By December 31, 2016		By December 31, 2017		By December 31, 2018		By December 31, 2019		By December 31, 2020	
	A	B	A	B	A	B	A	B	A	B	A	B
	%	%	%	%	%	%	%	%	%	%	%	%
Paper and cardboard	75		75		75		75		75		75	
Glass	75		75		75		75		75		75	
Plastic	40		45		45		45		45		50	
Metal	55		55		55		55		55		55	
Wooden	15		15		15		15		15		15	
Consumer sales	40	45	40	45	44	49	46	51	48	53	50	55
<b>Total</b>	<b>60</b>	<b>65</b>	<b>60</b>	<b>65</b>	<b>65</b>	<b>70</b>	<b>65</b>	<b>70</b>	<b>65</b>	<b>70</b>	<b>70</b>	<b>80</b>

### **Measures:**

- a) Maintain and develop the existing integrated system of separation of municipal waste, including its packaging component and promote further development of this system.
- b) Enact conditions of separate collection.
- c) Support the management of packaging waste according to the waste hierarchy.
- d) Enact new targets for recycling and recovery of packaging waste by 2020 and set individual targets for recycling and recovery of consumer sale packaging (see Table no. 40).
- e) Monitor rigorously the provision of separate waste collection in municipalities for recoverable components of municipal waste, at least for the commodities such as paper, plastics, glass and metals.
- f) Maintain participation of producers and importers of packaging according to the principle of "polluter pays" and "extended producer responsibility" for ensuring collection (take-back) and recovery of packaging components of municipal waste.
- g) Monitor rigorously the compliance with waste hierarchy.
- h) Continuously evaluate the management of packaging within the system of the municipality for municipal waste management, the capacity of the system and propose measures for its improvement.
- i) Continuously evaluate the system of municipal waste management at the regional level.

With regard to the Framework Waste Directive, which sets the 2020 recycling targets for certain waste from households, recycling targets are set for consumer packaging, i.e. packaging which as waste becomes a significant component of municipal waste.

The principles of take-back and recovery of packaging waste stem from the Packaging Act and the decision on authorization of an authorized packaging company issued pursuant to this Act.

### **3.3.1.6.2 Waste electrical and electronic equipment**

To meet the targets of the new Directive of the European Parliament and the Council 2012/19/EU on waste electrical and electronic equipment, ensure and achieve:

#### **Objective and targets:**

- a) **Achieve high level of separate collection of waste electrical and electronic equipment.**

By December 31, 2015 achieve the level of separate collection of waste electrical and electronic equipment per inhabitant per calendar year in the value provided in Table no. 41.

Achieve in the years 2016 to 2021 the minimum level of collection of waste electrical and electronic equipment provided in Table no. 42.

Table 41: Indicator and target for separate collection of waste electrical and electronic equipment (kg/ inhabitant/year).

<b>Indicator:</b> The weight of waste electrical and electronic equipment separately collected per inhabitant per year (kg/inhabitant/year).	
	<b>Separate collection</b>
<b>Target by December 31, 2015</b>	<b>&gt;5.5 kg /inhabitant/year</b>

Table 42: Indicator and targets for separate collection of waste electrical and electronic equipment (%).

<b>Indicator:</b> Minimum rate of separate collection of waste electrical and electronic equipment determined as percentage, by weight, of the quantity of waste electrical and electronic equipment collected separately in the given calendar year relative to the average annual weight of electrical and electronic equipment put on the market in the Czech Republic in the previous three calendar years (%).	
	<b>Separate waste collection</b>
<b>Target for the year 2016 (by August 14, 2016)</b>	<b>&gt;40%</b>
<b>Target for the year 2017</b>	<b>&gt; 45%</b>
<b>Target for the year 2018</b>	<b>&gt;50%</b>
<b>Target for the year 2018</b>	<b>&gt;55%</b>
<b>Target for the year 2020</b>	<b>&gt;60%</b>
<b>Target for the year 2021 (by August 14, 2021)</b>	<b>65% (85% of produced)</b>

According to the Directive 2012/19/EU, until December 31, 2015, the rate of separate collection on the average of at least four kilograms of waste electrical and electronic equipment from private households per inhabitant per year applies, or the same rate of weight of waste electrical and electronic equipment from private households, which was collected on the average in the previous three years, whichever of these values is higher, provided that a gradual increase of take-back compared to the achieved state has to be ensured.

According to the Directive, from the year 2016 the monitoring indicator changes, whereas not only the volume of collected waste electrical and electronic equipment from private households will be evaluated, but also the collection of all waste electrical and electronic equipment. When setting the goals for the Waste management plan of the Czech Republic, the values where derogation has been applied for the Czech Republic were used as basis.

**b) Ensure high level of recovery, recycling and preparing for re-use of electric and electronic waste.**

Achieve in the years 2015 - 2018 the required percentage of recovery, recycling and preparing for re-use, out of the total weight of the processed electrical and electronic waste in the collected waste electrical and electronic equipment, see Table no. 43.

From 2018 achieve the required rate (%) of recovery, recycling, and preparation for re-use from the total weight of the processed electrical waste (collected waste electrical and electronic equipment), see Table no. 44.

Table 43: Indicators and targets for recovery, recycling and preparation for re-use, relative to the total weight of processed electrical and electronic waste and collected waste electrical and electronic equipment (%).

<b>Indicator:</b>				
a) Percentage share of weight of the output fraction from the processing of electrical and electronic equipment waste transferred for recovery in the total weight of processed electrical and electronic equipment (all collected electrical and electronic equipment waste (%)).				
b) Percentage share of weight of the output fraction from the processing of electrical and electronic waste transferred for preparation for re-use and recycling in the total weight of processed electric and electronic waste (all collected electrical and electronic equipment waste (%)).				
	<b>Targets up to August 14, 2015</b>		<b>Targets from August 15, 2015 to August 14, 2018</b>	
	<b>Recovery</b>	<b>Recycling and Re-use</b>	<b>Recovery</b>	<b>Recycling and preparing for re-use</b>
1. Large household appliances	<b>80%</b>	<b>75%</b>	<b>85%</b>	<b>80%</b>
2. Small domestic appliances	<b>70%</b>	<b>50%</b>	<b>75%</b>	<b>55%</b>
3. Telecom devices and IT equipment	<b>75%</b>	<b>65%</b>	<b>80%</b>	<b>70%</b>
4. Consumer equipment	<b>75%</b>	<b>65%</b>	<b>80%</b>	<b>70%</b>
5. Lighting devices	<b>70%</b>	<b>50%</b>	<b>75%</b>	<b>55%</b>
5a. discharge tubes		<b>80% *</b>		<b>80% *</b>
6.Tools	<b>70%</b>	<b>50%</b>	<b>75%</b>	<b>55%</b>
7. Toys and sport	<b>70%</b>	<b>50%</b>	<b>75%</b>	<b>55%</b>
8. Medical equipment	<b>70%</b>	<b>50%</b>	<b>75%</b>	<b>55%</b>
9. Monitoring and control equipment	<b>70%</b>	<b>50%</b>	<b>75%</b>	<b>55%</b>
10. Automatic dispensers	<b>80%</b>	<b>75%</b>	<b>85%</b>	<b>80%</b>

Table 44: Indicators and targets for recovery, recycling, and preparation for re-use, relative to the total weight of the processed electrical and electronic waste and collected electrical and electronic equipment waste (%).

	Targets from August 15, 2018 **	
	Recovery	Recycling and preparing for re-use
1. Equipment for heat exchange	85%	80%
2. Screens, monitors, and equipment containing screens having a surface greater than 100 cm <sup>2</sup>	80%	70%
3. Light sources		80% *
4. Large equipment	85%	80%
5. Small equipment	75%	55%
6. Small information technology and telecommunication equipment (external dimension no more than 50 cm)	75%	55%

\* (For discharge tubes recycling only)

The new directive sets out the calculation of indicators for the monitoring of recovery rate of waste electrical appliances and electrical and electronic waste. This indicator is calculated by dividing the weight of waste electrical and electronic equipment in each group, which after proper selective processing of electric waste enters the facility for recycling or recovery, including preparation for re-use, by the total weight of take-back electrical equipment and separately collected electrical and electronic waste in each group of electrical equipment, expressed in percent.

The minimum values of recovery, recycling and re-use until 2015 are connected to the existing minimum values according to Directive 2002/96/EC and from the year 2015, the minimum value for recovery and material recovery will increase by 5% (excluding fluorescent tubes and discharge tubes). From the year 2018, a change in the classification of electrical equipment into groups will be implemented, but the values for the minimum rate of recovery will be for the single types of electrical equipment preserved.

#### Measures:

- a) Implement legislation to adjust the functional system of take-back of waste electrical and electronic equipment, especially in relation to the European legislation so that it makes it possible to meet the targets required by Directive 2012/19/EU.
- b) Promote cooperation of liable persons across the system of collection, e.g. with regard to quality control and checking of recorded data, collection network availability for

consumers or the implementation of awareness and information campaigns to increase the amount of separately collected electric and electronic equipment.

- c) Establish by legislation the duties and responsibilities of individuals within the whole take-back system, with the intention of a special "lenient" regime for waste management during collection and transportation of waste electrical and electronic equipment.
- d) Establish by legislation supervisory powers over the producers and collective systems, including the possibility of performing effective spending audit of funds collected under the take-back system of waste electrical and electronic equipment.
- e) Establish supervisory powers by legislation.
- f) Enhance the cooperation of liable persons with municipalities and strengthen the link between collection network and the municipal systems of municipal waste management.
- g) Set standards for collecting, transporting, and processing of waste electrical and electronic equipment and consistently enforce them by the individual bodies of state administration and local governments.
- h) Secure in a better manner the existing collection infrastructure from theft and illegal removal.
- i) Consistently monitor and evaluate the functioning of scrap metal traders premises and facilities.
- j) Increase the availability and number of collection network locations for electrical and electronic equipment, especially the small ones, and publish these collection points at public administration webs in the register of take-back points.
- k) Intensify awareness campaigns.
- l) Comply with the waste hierarchy, with preference for re-use by the state and private institutions.
- m) Thoroughly monitor compliance with the waste management hierarchy.
- n) Support research and development of new technological processes and recycling technologies focusing on recovery of waste electrical and electronic equipment.
- o) Ensure conclusive record keeping of products placed on market, end-of-life products taken back and their further management.

### **3.3.1.6.3 Waste batteries and accumulators**

In order to meet the objectives of the Directive of the European Parliament and Council 2006/66/EC on batteries and accumulators and waste batteries and accumulators, ensure and achieve:

#### **Objectives and targets:**

- a) **Increase the level of separate collection** of waste portable batteries and accumulators.  
In the years 2015 - 2016 achieve the desired level of separate collection of waste portable batteries and accumulators, see Table no. 45.

Table 45: Indicator and targets for the separate collection of waste portable batteries and accumulators (%).

<b>Indicator:</b> Percentage share by weight of portable batteries and accumulators collected separately in the average weight of portable batteries and accumulators placed on the market in the three preceding calendar years in the Czech Republic (%).	
	<b>Separate collection</b>
<b>Target condition in the year 2016</b>	<b>of 45%</b>

- b) **Achieve high recycling efficiency of the recycling processes** of waste batteries and accumulators.

Achieve In the long term the required recycling efficiency of the recycling processes of waste batteries and accumulators.

The minimum recycling efficiency for the recycling of output fractions of the recycling process out of the total weight of waste batteries and accumulators entering the recycling process, see Table no. 46.

Table 46: Indicator and target for the recycling of output fractions in the total weight of waste batteries or accumulators entering the recycling process (%).

<b>Indicator:</b> Percentage share of weight of recycled output fractions of the recycling process in the total weight of batteries or accumulators entering the recycling * process.	
	<b>Target (2015 and onwards)</b>
	<b>Minimum recycling efficiency</b>
Lead-acid batteries	<b>of 65%</b>
Nickel-cadmium batteries	<b>75%</b>
Other batteries and accumulators	<b>50%</b>

The targets are set by European Parliament and Council Directive 2006/66/EC. (Appendix 3, Section B)

\* The exact methodology of calculation is determined by Commission Regulation (EU) no. 493/2012

Both of the set targets are in line with the European Parliament and Council Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators.

The input fraction is considered to represent the collected quantity waste batteries and accumulators entering the recycling process, the output fraction is the weight of materials that are produced from the input fraction as a result of the recycling process, and without further processing ceased to be waste or can be used for their original purpose or for other purposes, but excluding energy recovery.



## Measures:

- a) Establish by legislation the duties and responsibilities of individuals within the whole take-back system, with the intention of a special "lenient" regime for waste management during collection and transportation of portable and automotive batteries and accumulators.
- b) Establish by legislation the supervisory powers.
- c) Strengthen the link between the collection network and the municipal systems of municipal waste management and publish the collection points at public administration webs in the register of take-back points.
- d) Comply with the waste hierarchy.
- e) Ensure conclusive record keeping of products placed on market, end-of-life products taken back and their further management.
- f) Support research and development of recycling technologies that are environmentally friendly and cost effective.
- g) Intensify awareness campaigns.

### 3.3.1.6.4 End-of-life vehicles (wrecked cars)

In order to meet the objectives of the Directive of the European Parliament and Council 2000/53/EC on end-of-life vehicles, ensure and achieve:

#### Objectives and Targets:

- a) **Achieve a high rate of recovery when processing end-of-life vehicles (wrecked cars).**

In the year 2015 and onwards achieve the required % in recovery, recycling and re-use in the processing of selected end-of-life vehicles (selected wrecked cars) see Table no. 47.

Table 47: Indicators and targets for recovery, material and re-use and material fractions, relative to the total weight of collected end-of-life vehicles (wrecked cars) (%).

Indicator:	Target for 2015 and onwards	
	Recovery and re-use	Re-use and recycling
a) Percentage share of weight of recovered and re-used fractions obtained from the processing of selected end-of-life vehicles (selected wrecked cars) in the total weight of collected selected end-of-life vehicles (selected wrecked cars) (%).	95%	85%
b) Percentage share of weight of recycled fractions obtained from the processing of selected end-of-life vehicles (selected wrecked cars) in the total weight of selected end-of-life vehicles (selected wrecked cars) (%).		
Selected vehicles	95%	85%

All targets are designed in accordance with the European Parliament and Council Directive 2000/53/EC on end-of-life vehicles. The indicator is based on re-used, recycled, and recovered materials obtained after the removal of hazardous substances, dismantling, crushing and subsequent operations after crushing. For the material, which is then additionally processed, it is necessary to take into consideration its actual use.

#### **Measures:**

- a) Differentiate the management of selected end-of-life vehicles (selected wrecked cars) and other end-of-life vehicles (other wrecked cars).
- b) Set the standards for the collection and processing of selected end-of-life vehicles (selected wrecked cars), standards for re-use of parts from selected end-of-life vehicles (selected wrecked cars) and strictly enforce them by individual bodies of state administration and local governments.
- c) Ensure that the vehicle delivery to the processing facility is free of any expense for the last holder or owner, even when the entire vehicle handed over has zero or negative value. In this case, ensure that any costs or their significant portion was paid by the manufacturer, or that manufacturer accepts end-of-life vehicles (wrecked cars) free of charge.
- d) Comply with the waste hierarchy.
- e) Support research, development, innovation and implementation of processes and technologies with a positive influence on increasing the level of material and energy recovery of waste generated during the processing of end-of-life vehicles, focusing on the recovery of raw materials.
- g) Support the collection and processing of selected end-of-life vehicles (wrecked cars) from the funds collected in the form of fee to support the collection, processing, recovery, and disposal of end-of-life vehicles.
- h) Ensure conclusive record keeping of products placed on market, end-of-life products taken back and their further management.
- g) Publish the collection points at public administration webs in the register of take-back points.

#### **3.3.1.6.5 Waste tyres**

In the interest of Czech Republic waste management deepen the principles of producer responsibility for this commodity and fulfil:

#### **Objectives and Targets:**

- a) **Increase the level of separate collection** of waste tyres.

Achieve the required level of collection of tyres, see Table no. 48.

Table 48: Indicator and collection target for tyres placed on the market in the Czech Republic (%).

<b>Indicator:</b> Percentage share of weight of tyres separately collected in the average weight of tyres placed on the market in the previous calendar year in the Czech Republic (%). (In the event that last year nothing was provided, the collection rate is calculated from the same year.)	
	<b>Collection</b>
<b>Target status in the year 2016</b>	<b>35%</b>
<b>Target status in the year 2020 and onwards</b>	<b>80%</b>

b) **Achieve high recovery rate in the processing** of waste tyres.

From the year 2018 and onwards, achieve the desired % of recovery, recycling and re-use in the processing of waste tyres, see Table no. 49.

Table 49: Indicators and target for the recovery of tyres from the collected waste tyres (%).

<b>Indicator:</b> a) Percentage share of the weight of recovered waste tyres in the total weight of the collected waste tyres (%).	
	<b>Targets for 2016 and onwards</b>
	<b>Recovery</b>
Waste tyres	<b>100%</b>

The target is designed in view of the interest to fulfil the set waste management hierarchy and the need to increase the utilization of waste tyres.

**Measures:**

- a) Establish by legislation the duties and responsibilities of the individuals within the take-back system.
- b) Establish by legislation the supervisory powers.
- c) Enact the principle of special "lenient" regime for the waste management and for collection of waste tyres.
- h) Strengthen the link between the collection network and the municipal systems of municipal waste management so that the collection network parameters will be set in order to minimize the cost of waste tyre management for municipalities, publish the collection points at public administration webs in the register of take-back points.

- d) Intensify awareness campaigns.
- e) Observe the waste management hierarchy.
- f) Rigorously monitor compliance with the waste management hierarchy.
- g) Support research and development of new technological processes and recycling technologies focusing on the use of raw materials.
- h) Ensure conclusive record keeping of products placed on market, end-of-life products taken back and their further management.

### **3.3.1.7 Sludge from municipal wastewater treatment plants**

To improve the management of this waste implement:

#### **Objective:**

- a) **Support technologies for the recovery of sludge from municipal wastewater treatment plants.**

#### **Measures:**

- a) Monitor and evaluate the quantity of sludge from municipal wastewater treatment plants and the quantity of sludge utilized for application to the soil (composting and direct application of sludge on agricultural land).
- b) On the basis of legislatively established microbiological and chemical parameters vigorously check the quality of treated sludge for application to soil.
- c) Support from public funds investments associated with energy recovery of sludge from municipal wastewater treatment plants with adequate sludge production.
- d) Promote research focused on the monitoring of residues of pharmaceuticals and personal care products in wastewater and their penetration into sludge from municipal wastewater. Based on the research results continuously design and implement measures to dispose of sludge from municipal wastewater treatment plants with regard to the protection of human health and the environment.
- e) In cooperation with the Ministry of Health promote by awareness campaigns, focused primarily on the citizens, to provide guidance for the disposal of pharmaceuticals, chemicals and waste in accordance with the legislation in this area, i.e. disposal outside the sewerage network.
- f) Reflect legislative changes in the European Union in the area of waste sludge from waste water treatment plants with the emphasis on protecting human health, the environment, and in particular the soil in applying sludge from municipal wastewater in agriculture.

The target is based on expert discussions within the European Union related to the revision of Directive 86/278/EEC.

### **3.3.1.8 Waste oil**

In order to minimize the adverse effects of the generation and management of waste on human health and the environment, implement:

**Objective:**

- a) **Increase the material and energy recovery of waste oils.**

**Measures:**

- a) Avoid mixing oils in their places of origin, accumulation, and storage in view of their subsequent recovery.
- b) Use waste oils unfit for material recovery preferably for energy recovery in accordance with applicable legislation.
- c) Comply with the waste hierarchy.
- d) Rigorously monitor compliance with the management hierarchy of waste oils.

### **3.3.1.9 Waste from medical and veterinary care**

In order to minimize the adverse effects of the generation and management of waste on human health and the environment, implement:

**Objective:**

- a) **Minimize the negative effects of waste management from medical and veterinary care on human health and the environment.**

**Measures:**

- a) In cooperation with the Ministry of Health establish by legislation the rules for management of waste from medical and veterinary care focusing on the collection, sorting, gathering, treatment, transportation, and disposal of medical, veterinary and similar facilities e.g. home care and self-medication.
- b) Manage the waste from medical and veterinary care with hazardous properties according to the waste management hierarchy and according to available technologies, with preference for the best available techniques.
- c) In collaboration with the Ministry of Health establish by legislation the parameters for the effectiveness of sanitation of the decontamination facilities including quality parameters and strict follow-up monitoring.
- d) Establish cooperation with stakeholders in the area of education relating to the management of waste from medical, veterinary, and similar facilities, in order to ensure waste management from these facilities in accordance with the applicable legislation with a particular focus on consistent separation from municipal waste and on classifying waste into categories according to its actual properties.

- e) Establish by legislation training for all employees who handle waste from medical, veterinary, and similar facilities, including personnel involved at each step of management of this waste.
- f) In cooperation with the Ministry of Health develop an updated methodology for managing waste from medical and veterinary care reflecting current trends and principles of the World Health Organization and the European Union.

### **3.3.2 Specific groups of hazardous waste**

In order to improve the management of the following groups of waste and to minimize the adverse effects on human health and the environment, implement the following objectives and measures:

#### **3.3.2.1 Waste and equipment containing polychlorinated biphenyls**

**Objectives:**

- a) **Forward all equipment and waste containing polychlorinated biphenyls by the end of the year 2025 to authorized persons, or decontaminate by this time the facilities and waste containing polychlorinated biphenyls.**
- b) **Dispose of waste containing polychlorinated biphenyls held by persons authorized for waste management by the end of the year 2028.**

**Measures:**

- a) Adjust the legislation of rules for existing waste polychlorinated biphenyls and equipment containing polychlorinated biphenyls.
- b) Lightly contaminated equipment and equipment containing polychlorinated biphenyls and with a volume of less than 5 l, transfer to persons authorized to manage this type of waste, or decontaminated it by the end of the year 2025.

#### **3.3.2.2 Waste containing persistent organic pollutants**

In order to improve the management of waste with persistent organic pollutants and to minimize the adverse effects on human health and the environment, in accordance with the European Parliament and Council Regulation (EC) no. 850/2004 on Persistent Organic Pollutants implement the following objectives:

**Objectives:**

- a) **To raise awareness of persistent organic pollutants and their effects on human health and the environment.**
- b) **Monitor the occurrence of persistent organic pollutants** especially in waste listed in Annex V of the European Parliament and Council Regulation (EC) no. 850/2004 on Persistent Organic Pollutants, as amended by Commission Regulation (EU) no. 756/2010.

**Measures:**

- a) Implement information campaigns focused on the possible occurrence of persistent organic pollutants in waste.
- b) Identify potential sources of release of persistent organic pollutants.
- c) Define a methodology for monitoring of the occurrence of persistent organic pollutants in selected waste (Ministry of Environment).

### **3.3.2.3 Waste containing asbestos**

**Objective:**

- a) **Minimize the potential negative effects in the management of waste containing asbestos on human health and the environment.**

**Measures:**

- a) Reflect changes in the legislation of the European Union in the management of asbestos waste with emphasis on protecting human health and the environment.
- b) Develop, in cooperation with the Ministry of Regional Development and the Ministry of Health, a procedure for the construction permitting authorities, how to influence the management of asbestos waste in a desirable way within the framework of the permitting of reconstruction and building demolition.
- c) Carry out permanent education and monitoring of safe management and hygiene when managing asbestos. The Ministry of the Environment (hereinafter the "Ministry") in cooperation with the Ministry of Health will carry out a campaign to inform the inhabitants and ensure the implementation of supervision by the competent supervisory authorities.
- d) Implement economic benefits for the disposal of waste containing asbestos.

### 3.3.2.4 Waste containing natural radionuclides

#### Objective:

- a) **Minimize the potential negative effects in the management of waste containing natural radionuclides on human health and the environment.**

#### Measures:

- a) Supervise the management this type of waste (State Office for Nuclear Safety).
- b) Develop, in cooperation with the State Office for Nuclear Safety a guideline for managing this type of waste under the Waste Act (Ministry of Environment).

### 3.3.3 Other groups of waste

#### 3.3.3.1 Animal by-products<sup>19</sup> and biodegradable waste from kitchens and canteens<sup>20</sup>

To improve the management of that waste, products and minimize the adverse effects on human health and the environment to take the following objectives and measures:

#### Objectives:

- a) **Reduce the quantity of biodegradable waste from kitchens and canteens and animal by-products in mixed municipal waste, originating from public catering establishments (restaurants, snacks) and central kitchens (hospitals, schools and other similar facilities.)**
- b) **Properly manage biodegradable waste from kitchens and canteens and animal by-products and reduce the negative effects associated with the management of waste on human health and the environment.**

#### Measures:

- a) Support the establishment of a system of regular collection and transport of biodegradable waste from kitchens and canteens and animal by-products into approved processing facilities, especially biogas plants and composting plants.

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<sup>19</sup> Regulation of the European Parliament and Council Regulation (EC) no. 1069/2009 of 21 October 2009 laying down health rules concerning animal by-products and derived products not intended for human consumption and repealing Regulation (EC) no. 1774/2002 (the Animal By-product Regulation).

<sup>20</sup> Commission Regulation (EU) no. 142/2011 of 25 February 2011 implementing the European Parliament and Council Regulation (EC) no. 1069/2009 laying down health rules concerning animal by-products and derived products not intended for human consumption and implementing Council Directive 97/78/EC as regards certain samples and items exempt from veterinary checks at the border under that Directive.



- b) Ensure conditions for the collection of used cooking oil and fat originating from public catering establishments, central kitchens and households.
- c) Support the development of a system of collecting and collection of used cooking oil and grease from the originators and households.
- d) Support the development of facilities for the processing of waste oils and fats, especially facilities used to produce energy (biogas plants, processing into biodiesel or other products for industrial use).
- e) Thoroughly monitor the management of biodegradable waste from kitchens and canteens and of animal by-products in accordance with Regulation of the European Parliament and Council Regulation (EC) no. 1069/2009.
- f) Monitor and evaluate developments in the management of biodegradable waste from kitchens and canteens and animal by-products, design and adopt appropriate measures.
- g) In cooperation with the Ministry of Agriculture promote awareness campaigns concerning the management of biodegradable waste from kitchens and canteens and animal by-products in accordance with the legislation in this area.

The objectives are formulated with regard to the European Parliament and Council Regulation (EC) No. 1069/2009 laying down health rules concerning animal by-products and derived products not intended for human consumption and repealing Regulation (EC) no. 1774/2002 on animal by-products.

### **3.3.3.2 Waste of ferrous and non-ferrous metals**

In the interest of ensuring a competitive economy and increasing self-sufficiency of the Czech Republic in raw material resources the following is established:

#### **Objective:**

- a) **Process metal waste and end-of-life products into materials replacing primary raw materials.**

#### **Principles:**

- a) Perceive the metal waste of ferrous and nonferrous metals and waste of precious metals as strategic raw materials for the industry of the Czech Republic in accordance with the Raw material policy of the Czech Republic.
- b) Manage iron and aluminium scrap waste outside of the waste management regime solely on the basis of Council Regulation (EU) No. 333/2011 laying down criteria determining when certain types of scrap metal cease to be waste.
- c) Manage scrap copper outside of the waste management regime solely on the basis of Commission Regulation (EU) no. 715/2013 laying down the criteria for determining when copper scrap cease to be waste.

**Measures:**

- a) Expand the number of locations for end-of-life product take-back in the context of take-back systems and extended producer responsibility in order to obtain larger quantities of raw materials of strategic precious metals.
- b) Support the development of modern high-quality technologies for the processing of end-of-life products in the Czech Republic.
- c) Analyze and adjust the business environment in the area of waste collection and waste trade.
- d) Increase the level of supervisory activities in metal scrap trading.

### **3.4 Principles of creating waste management facility network**

In order to achieve the objective of creating a comprehensive and adequate network of waste management facilities at the national level and also the regional level, in accordance with the principles of "self-sufficiency and proximity", and also with the intention to comply with the waste management hierarchy, and to promote advanced technologies with added environmental value, the balanced and efficient network of facilities for waste treatment will include groups of facilities of different capacities and importance with regard to the integration of the facilities into the waste management systems at local, regional and trans-regional level. The waste management facility network should also include modern innovative technologies.

Based on conceptually established priorities and the needs of waste management in the Czech Republic, the need arises to establish and coordinate with the Regional waste management plans the waste management facility network, in relation to the larger regional situation of meeting objectives in waste management.

The waste management facility network has to be optimally configured mainly from a regional perspective. Every facility that meets the statutory requirements for its operation will have the possibility to obtain an operating permit. It is necessary to monitor the real necessity, economic competitiveness and sustainability of facilities for waste management in the individual regions.

The waste management facility network configured by the Regional waste management plan will be essential in channelling support to these facilities from public sources.

The facility network optimization will also be made possible due to the financial support from the Operational Programme Environment 2014 - 2020 within the framework of the implementation of the structural support of the European Union for the Czech Republic. The

Operational Programme Environment 2014-2020 will be structured for the purpose of achieving the objectives of the Waste management plan of the Czech Republic.

For the facilities of trans-regional importance, represented e.g. by facilities for energy recovery of waste, it is necessary to reflect the cooperation between the regions.

The individual region will systematically define the primary needs and the capacity of waste management facilities on its territory in relation to waste management and the current status of the objectives of the Waste management plan of the Czech Republic and the Regional waste management plan.

In the analysis of facilities in their territories, the regions may work in partnership with the Ministry.

These facts are a prerequisite for the effective direction of public support for the development of facilities for waste management or other waste management activities.

Based on the current state of compliance with the objectives and targets of the Waste management plan of the Czech Republic and Regional waste management plans, the network of facilities for waste management will be optimally allocated both from the national and the regional perspective, in relation to the objectives of waste management plans.

**Objective:**

- a) **Create and maintain a comprehensive, adequate, and effective network of waste management facilities in the Czech Republic.**

**Waste management facility network**

**Basic facility classification**

The basis for establishing the principles and specifications defining the facilities is their role in the waste management systems. From this perspective, the facilities may be classified as follows:

**Facilities with potential trans-regional significance:**

- Facilities for energy recovery.
- Facilities for recovery or disposal of other waste (e.g. landfills).
- Facilities for recovery or disposal of hazardous waste.
- Facilities for the recovery of suitable biodegradable waste from municipalities (e.g. composting plant, biogas stations).
- Systems of collection and transportation of waste, including transfer stations.
- Facilities for final screening and treatment of waste.

- Collection systems for recoverable, bulky, dangerous, and other mixed waste, including take-back of products.
- Facilities and technologies for processing and material recovery of sorted and treated waste.

### **Facilities needed to ensure the functionality of the waste management facility network:**

- Facilities for the recovery of "secondary raw materials."
- Dismantling lines for selected end-of-life products (including end-of-life vehicles).

### **Supplementary facilities:**

- Facilities for waste collection and trade.
- Final sorting facility for mixed municipal waste.
- Final sorting facilities for bulky waste.
- Facilities for waste co-incineration.

### **More detailed description of the individual facilities and processes**

#### **Collection systems, collection, and waste purchasing:**

- Separate collection of recoverable components into colour-coded collection containers, bulk containers, or collection in sacks.
- Separate collection of bio-waste in special collection containers or potentially collection in sacks.
- Collecting yards for the collection of bulky waste, hazardous waste, biodegradable waste, construction waste, metals and others.
- Locations for take-back of electrical and electronic equipment, batteries, tyres, supplementary collection of reusable components.
- Collection of mixed municipal waste in containers and large containers.
- Collection of additional waste (street cleaning, etc.).
- Locations for purchase of waste - (metals, etc.).

#### **Systems of collection and transportation of waste:**

- Fleet of specially equipped vehicles for the collection of waste from collection containers of all kinds (including sack collection).
- Container carriers for large containers.
- Transfer stations (used to streamline the transport of waste over long distances).

#### **Facilities for the processing and recovery of waste:**

- Facilities for final sorting for paper, plastic (sorting, pressing, etc. to manufacture "secondary raw materials").
- Final sorting facilities and subsequent processing of glass (final sorting, crushing, drying etc. for the production of material for the final processors).
- Final sorting and pressing of metal waste in scrap yards.

- Final sorting and processing of other types of recoverable waste.
- Facility for energy recovery.

### **Facilities for processing and recovery of bio-waste:**

Facilities suitable for the processing of biological waste and for its recovery, based on the properties and origin of bio-waste. These are mainly:

- Facilities based on the aerobic decomposition of biodegradable waste, these are different types of composting plants. These facilities are suitable for plant waste (waste from public green spaces, gardens of households).
- Facilities based on anaerobic decomposition of biodegradable waste, in particular facilities with anaerobic digestion (digestion) (e.g. biogas stations). These facilities are, after installation of sanitation equipment, suitable for animal biological waste and for catering waste, etc.
- Larger facilities for the aerobic decomposition (composting) or anaerobic digestion (digestion) of waste, conceptually designed for the processing of agricultural, food, and wood waste (or potentially sludge) to which municipal waste is added.
- Facilities for the material recovery of biodegradable waste, primarily of wood represented by the technology of fibreboard manufacture from shredded wood.
- Facilities for energy recovery from biodegradable waste.
- Other facilities for the processing and recovery of biodegradable waste.

### **Waste disposal facilities:**

- Landfills of group S-inert waste (S-IO) – specified for inert waste.
- Landfills of group S-other waste (S-OO) – specified for the category “other” waste, which in turn are divided into subgroups:
  - S-OO1 - landfills or sectors of landfills specified for the disposal of category “other”, waste with low biodegradable organic matter content and waste from asbestos under the conditions laid down in the implementing<sup>21</sup> legal regulation.
  - S-OO3 - landfills or sectors of landfills specified for the disposal of “other” category waste, including waste with significant biodegradable organic content, waste that may not be evaluated on the basis of their water leachate, and waste from asbestos under the conditions laid down in the implementing legal regulation. These landfills or sectors may not accept gypsum-based waste.
- Landfills of the group S-hazardous waste (S-NO) - specified for hazardous waste.
- Hazardous waste incinerators.

## **Principles of creating waste management facility network**

### **Principles:**

- a) Support the construction of facilities in accordance with the hierarchy of waste management.

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<sup>21</sup> Decree no. 294/2005 Coll., on the conditions of disposal of waste in landfills and their use on ground surface, and amending Decree no. 383/2001 Coll., on details of waste management, as amended.

- b) Create conditions for the completion of the national network of facilities for hazardous waste management.
- c) Propose new facilities in accordance with the legislative and technical requirements and best available techniques.
- d) Utilize the existing facilities that comply with the required technical level pursuant to item c).
- e) Support from public funds the construction of facilities with proven economical and technical effectiveness of their operation at the regional and national level, reflecting their adequacy within the existing facility network and in accordance with the Regional waste management plans and Waste management plan of the Czech Republic.
- f) Within the framework of the evaluation process relating to the public support, assess the waste management facility from the perspective of providing input of the relevant species of waste that will be managed, including the review of documentation demonstrating that in the area there is sufficient waste quantity for the technology or system for waste management, and that the facility is adequate in terms of capacity.
- g) Within the framework of the evaluation process relating to the public support, evaluate the waste management facility from the perspective of contractual arrangements for facility outputs sales.
- h) When providing support from public sources for material recovery of biodegradable waste, emphasize compliance with the closed cycle, require proof of sales arrangements for the use of compost on agricultural land or in land reclamation.
- i) Prefer support from public funds for the construction of facilities where the output is a materially recoverable product.
- j) When providing support from public sources, recommend the appropriate facility's capacity of regional importance, so that it will be a valid part of the waste management system.
- k) A recommending statement of the region will be required to prove the necessity of facility's design capacity in the region and to obtain support for this facility from public sources. The statement of the region will be based on the compliance with applicable Regional waste management plan and the supporting documents proving the deficit of such facilities identified in the Regional waste management plan objectives evaluation.
- l) Incorporate gradually the requirements for the facility network into the spatial planning documents as an important basis for decision-making on the future development (especially of industrial zones).
- m) Do not support the construction of new landfills from public funds.
- n) Define waste streams and their processing conditions under which a permit will not be required to operate the facility.
- o) Inform about the criteria and conditions set out by the European Union when waste ceases to be waste and methodically clarify the procedures leading to the removal of the waste regime.
- p) Support research plans for projects aimed at developing of new recovery, recycling, and processing waste technologies, or verification of technologies and waste management facilities not yet operated in the Czech Republic.

## **Measures:**

- a) Continuously evaluate the network of facilities for waste management at the regional level.
- b) Evaluate waste management facility network on a national level.
- c) On the basis of the current state of compliance with performance objectives in Regional waste management plans, identify the necessary facilities for waste management in the region.
- d) On the basis of the current state of compliance with performance objectives of the Waste management plan of the Czech Republic, identify the preferred waste management facilities recommended for support from public sources.
- e) Develop a methodological guideline for the evaluation of Regional waste management plans (Ministry of Environment).

## **Waste collection**

In order to achieve the objective of creating a comprehensive and adequate network of waste management facilities at the national level in accordance with waste management hierarchy and in order to achieve the objective to maximize the recovery of waste as a source of raw materials and also to reduce greenhouse gas emissions from waste in landfills, develop the municipal waste collection systems. Retain the collection and buyout points for metals with the perspective that system of awarding and revoking the permission to operate waste collection facilities will be tightened.

## **Principles of waste collection**

### **Principles:**

- a) Intended projects of waste collection yards (or similar) will ensure the collection of paper, metal, plastic, glass, bulky waste, hazardous components of municipal waste and the premises for take-back of electric and electronic equipment.
- b) Support separate collection of recoverable components of municipal waste, with the inclusion of packaging components, through a sufficiently numerous and accessible network of collection points in communities, at least for paper, metals, plastics, and glass, assuming the use of existing collection systems and waste gathering, and if possible, also the collection systems for selected end-of-life products which are provided by the liable persons i.e. by the manufacturers, importers, distributors.
- c) Support separate collection of bio-waste.
- d) Support separate collection of hazardous components of municipal waste in order to achieve environmentally sound management of waste.
- e) In the facilities for waste buyout and collection, allow the purchase of waste from citizens only in accordance with applicable legislation.
- f) In take-back locations of end-of-life products allow free acceptance of these products from citizens.

## **3.5 Decision making principles for transboundary transportation, import and export of waste**

In order to achieve the objective not to endanger by transboundary movement of waste the human health and environment, comply with the principles of the European Parliament and Council Regulation (EC) no. 1013/2006 on shipments of waste, as amended ("Waste shipment regulation"), when deciding in matters of transboundary transportation, import and export of waste.

### **Objective:**

- a) **Do not endanger human health and the environment in the Czech Republic by transboundary movement of waste.**

### **Principles:**

- a) National and international cooperation in the enforcement of the Waste shipment regulation, in particular in the field of supervision and the methodology of transboundary transport of waste amongst the neighbouring countries and the Czech Republic, and amongst the public administration authorities themselves.
- b) Waste generated in the Czech Republic is preferentially disposed of in the Czech Republic.
- c) Transboundary shipment of waste from the Czech Republic for the purpose of disposal is permitted only in the event that the Czech Republic does not have sufficient capacity to dispose of a certain type of waste in an efficient manner and with a positive influence on the environment.
- d) Transboundary shipment of waste to the Czech Republic for the purpose of disposal is prohibited.
- e) Waste generated in the Czech Republic is primarily recovered in the Czech Republic, unless not recovered in other Member States of the European Union.
- f) Transboundary shipment of waste to the Czech Republic for the purpose of recovery is permitted only to facilities that are operated in accordance with applicable law, and which have sufficient capacity.
- g) All phases of waste management are evaluated until waste transfer to the final facility for recovery or disposal.
- h) If waste is transported into the Czech Republic intended for an interim recovery in the regime of general information requirements pursuant to Article 18 of the Waste shipment regulation, a submittal of information on subsequent other than interim recovery is required in the form of an accompanying document pursuant Annex VII, Waste Shipment Regulation or its Annex.
- i) Transboundary shipment of waste into the Czech Republic for the purpose of municipal waste energy recovery by incineration is prohibited, if such transboundary shipment



would result in the disposal of waste produced in the Czech Republic or the transboundary shipment would result in the need to process waste generated in the Czech Republic in a manner not in accordance with waste management plans.

- j) Mixed municipal waste is always evaluated pursuant to Article 3, paragraph 5 of the Waste shipment regulation, including cases when it was subjected only to mechanical processing, gravity separation of density fractions or similar processing, which has not significantly changed its properties.
- k) Take-back products at transboundary movement out of the Czech Republic are considered as waste immediately upon delivery of collected products for transboundary transport.
- l) The Ministry may file a complaint against the notified transboundary shipment if the notifier or the consignee, during the five years prior to the issuance of the decision on the shipment of waste, have been lawfully sanctioned by penalties for breaches of legislation in the field of waste management.
- m) The Ministry may file a complaint against the notified transboundary shipment if on the notifier or the consignee, during the five years prior to the issuance of the decision on the shipment of waste, a corrective measure has been imposed for breaches of legislation in the field of waste management and it has been proven that the corrective measure had not been fulfilled in the allocated term.
- n) Persons responsible for incomplete or illegal shipment are liable for the costs associated with the transportation, recovery, disposal, and storage of such waste. These persons are liable for paying the costs jointly and severally. If such persons are not identified, the cost is borne by the State.

### **3.6 Measures to reduce illegal waste deposition and ensure management of waste with unknown or expired owner**

In order to achieve the objective of reducing waste deposition outside the specified locations, particularly at the level of municipalities and the state, implement the following measures:

#### **Objective:**

- a) **Reduce waste deposition outside the specified locations.**
- b) **Ensure proper management of waste deposited outside the specified locations and of waste whose owner is unknown or has expired.**

#### **Measures:**

- a) Establish by legislation the responsibility of the property owner to ensure management of waste whose originator is unknown, located on his/her property. Set up a system of paying the costs reasonably incurred by public funds in the case that the property owner

proves that the deposition of the waste on his/her property was not caused by him/her or that he/she could not have prevented it.

- b) Enact that when the new owner takes ownership of the property, he/she also becomes the owner of the waste on or in the property.
- c) Create effective public awareness and education programmes at the local government level in cities and municipalities, including support, particularly in the form of securing of funding for these programmes.
- d) Involve the public in programmes and events leading to the formation of a positive attitude to maintain clean environment and practice proper waste management.
- e) Actively involve the manufacturers in developing marketing campaign programmes for consumer products or services.
- f) Effectively use penalties for pollution of public<sup>22</sup>spaces.
- g) Increase the maximum limit for a fine for the offense of establishing unauthorized landfill or waste deposition outside of specified locations.
- h) Focus the supervision of municipal offices with extended competency on unauthorized use of municipal systems to manage waste from legal entities and natural persons authorized to do business.
- i) Involve under contract legal entities and natural persons authorized to do business in municipal waste management systems.
- j) Inform citizens and businesses about the possibilities of fining for activities associated with the deposition of waste outside the specified locations.
- k) Configure in an optimum way the system and logistics of collection and transport of waste on the municipal level (mixed municipal waste, sorted components of municipal waste, bulky or hazardous waste, waste from rubbish bins in public spaces and cleaning of public areas).
- l) Establish communication channels at the municipal level through which citizens may report illegal waste disposal in public places or temporary storage of waste in the vicinity of collection areas and containers.
- m) Utilize the institute of public works or the institute a public service by the local municipality governments to ensure cleaning and public areas services, including activities related to waste disposal deposited outside the specified locations.

### **3.7 Waste prevention programme**

In accordance with the requirements of European Parliament and Council Directive 2008/98/EC on waste, the Waste management plan of the Czech Republic includes the Waste prevention programme (hereinafter the "Programme").

The Waste prevention programme widely affects the different sectors of the economy of the Czech Republic, influences not only the waste management sector, but also the mining and manufacturing industries, design services, training and education, both public and private

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<sup>22</sup> § 47 of Act no. 200/1990 Coll., on misdemeanours, as amended.

consumption. Also reflected is the effort to reduce the consumption of raw materials and energy. This dimension must be taken into account when drafting the objectives and measures.

The objectives and measures are defined in an effective and efficient way.

Prevention in waste management will be focused both on the reduction of the amount of waste produced and on the reduction of its hazardous properties that have an adverse impact on environment and public health. Re-use of products and preparing for re-use is also considered as prevention. Objectives and measures are generally aimed at the prevention of waste, emphasizing prevention in selected streams.

The main benefits of the Programme are expected in securing the information available at various levels, raising awareness about the subject, increasing the sense of own responsibility, real enforcement of measures for the citizens, institutions, businesses with interests in the area, increasing competitiveness of the entities involved, and of the Czech Republic, the development of science and research in the field of waste prevention.

In connection with the fact that the Programme of waste prevention of the Czech Republic, is focused in more depth on selected waste streams, the following measures are only a limited list of possible steps in waste prevention.

#### **Main objective:**

- a) **Through a co-ordinated and harmonised approach, create conditions conducive to a lower consumption of primary resources and a gradual reduction of the volumes of waste produced.**

#### **Sub-objectives:**

- a) **Throughout the entire period of implementation of the CR Waste prevention programme, ensure a comprehensive information support focused on issues of concern including the introduction of the waste prevention topics into school curricula, research programmes, and educational as well as awareness-raising activities relative to the protection and formation of environment.**
- b) **Ensure an effective involvement of the state administration at all its levels in the issues of waste prevention, aiming to gradually reduce the volume of waste produced through the operation of the state administration bodies.**
- c) **Create conditions and set up stimulating elements for reducing the use of raw materials and energy resources in the production sectors while boosting the use of secondary materials in connection with further strategic documents, in particular the CR Raw materials policy and the CR Secondary materials policy, in linkage to the CR Waste management plan.**
- d) **Foster using all means available the introduction of low-waste and innovative technologies that will conserve input raw and other materials, and support the**

**production and industrial spheres in an effort at optimising the production control processes from the aspect of meeting the Programme objectives.**

- e) **Support, promote and disseminate adequate information at all levels on voluntary instruments available** (voluntary agreements, environmental management systems, environmental labelling systems, cleaner production systems) **aiming to widen their scope.**
- f) **In connection with the Programme objectives, with the goals of other environmental programmes and policies and with the requirements spelled out by the European Union bodies, provide a suitable legislative environment conducive to the implementation of the Programme**
- g) **Pay maximum attention to food waste and create conditions conducive to a gradual reduction of the volume thereof at all levels of the food cycle** (covering the various stages of the production of foodstuffs including the placing of food production on the market and the consumption thereof).
- h) **Create conditions for stabilising the production of the various components of municipal waste and for subsequent reductions at all levels of public administration and at the level of the citizen.**
- i) **In co-ordination with other strategic documents, create conditions for stabilising the production of hazardous wastes, construction and demolition wastes, textile wastes and wastes originating from product-related guidelines, with an outlook of a real cutback of the production thereof in subsequent years.**
- j) **Promote the utilisation of service and charity centres and organisations for the purpose of extending the service life and the re-use potential of products and materials.**
- k) **Enhance the active role of research, experimental development work and innovation in the area of support to the CR Waste prevention programme.**
- l) **Raise the effectiveness of implementation of waste prevention topics in the activities of collective systems and product take-back systems.**
- m) **Ensure implementation of the requisite analytical supporting documents and evaluation instruments for the purpose of evaluating the effectiveness of the CR Waste prevention programmes and for assessing the progress attained in relation to the phased preventative measures and targets.**

The measures provided below are based on the draft measures provided in Annex IV of the Directive 2008/98/EC on waste, on the analysis of existing measures, and the analysis of waste streams. At the same time they take into account other strategic planning documents, such as the Raw material policy of the Czech Republic and the Secondary raw materials policy of the Czech Republic. The measures are designed so that they are also in line with the new Operational programme Environment for the period 2014 - 2020. It also takes into account the trends in waste management at the European Union level and implemented preventive measures abroad.

## Measures:

### Block 1 - Information support, education and awareness:

- a) Create and throughout the whole period of implementation of the Waste prevention programme ensure the continuous operation of a freely accessible information base covering waste prevention at all levels. Develop and freely promote a handbook to show to the people how to prevent waste (with a focus on municipal waste and its individual components).  
(Strategy: informational, promotional, fulfilment of objectives: a, d, e, g, h, i, j, l)
- b) Technically support the dissemination of information and awareness programmes for the purpose of gradually increasing the quantity of collected clothing, textiles, shoes, toys, books, magazines, furniture, carpets, tools, and other reusable products. Publicly promote the activities of non-profit organizations taking back products for re-use and similar organizations, and ensure the creation of interactive publicly accessible network (maps) of these organizations and centres.  
(Strategy: informational, promotional, fulfilment of objectives: a, b, e, h, i, j)
- c) Technically support the dissemination of information and awareness programmes for the purpose of gradually increasing the quantity of collected electrical and electronic equipment and to reduce waste production of these products: ensure drawing up of an analysis and support the creation of an information network of service centres for repairs and further use of electrical and electronic equipment for its original purpose, including the preparation of rules for the operation of the service centres and the system for their certification; ensure the drawing up and dissemination of a handbook for citizens informing them on purchase optimization and the use of electrical and electronic equipment in terms of the potential generation of waste.  
(Strategy: informational, regulatory, fulfilment of objectives: a, c, f, j, l)
- d) Technically support the dissemination of information and awareness programmes focused at reducing the production of waste from food: ensure the development and dissemination of a handbook for citizens informing them on food purchase optimization and its subsequent storage in terms of the potential generation of waste; provide a handbook for owners and operators of restaurants, hotels and other catering facilities with a focus on preventing food waste.  
(Strategy: informational, promotional, fulfilment of objectives: a, g)
- e) Provide information and educational support on the subject of waste prevention at all levels of state administration with special focus on local governments of cities and municipalities with regard to the stabilization of production and gradual reduction of municipal waste production.  
(Strategy: informational, promotional, fulfilment of objectives: a, b, h)
- f) Ensure drawing up of a guide for the prevention of waste from the construction industry for construction material manufacturers, designers, investors, construction companies, and citizens and make public construction materials containing hazardous substances and having a negative impact on human health and the environment.  
(Strategy: informational, promotional, fulfilment of objectives: a, b, i)

- g) In the context of Environmental education programmes, education and public awareness ensure the development of a learning material on the subject of waste prevention and its subsequent practical inclusion in the school curricula to raise awareness about the subject.  
(Strategy: information and publicity; fulfilment of objectives: a)
- h) Under the framework of collective systems and product take-back systems ensure that all stakeholders extend their activities on the subject of waste prevention, especially through information campaigns aimed at raising public awareness.  
(Strategy: informational, promotional, fulfilment of objectives: a, l)
- i) Promote focused support and promotion of trustworthy environmental labelling and products with a lower impact on the environment with the aim of gradually increasing the number of directives and licenses of the National Programme of Environmental Labelling.  
(Strategy: information and publicity, control; fulfilment of objectives: a, b, e, h, i)

## **Block 2 - Regulation and planning:**

- j) Develop an expert analysis of the possibility to establish new legislative requirements and objectives in the field of waste prevention in the Czech Republic, with regard to the current developments in the European Union legislation, including the determination of the legislative requirements for the operation of facilities for the re-use of end-of-life products, and optimization of the existing legislative requirements for catering equipment and food utilization in order to reduce the amount of food waste. During the implementation of the Waste prevention programme consistently implement and monitor compliance with the requirements for the prevention of waste resulting from the product directives and the Framework Waste Directive and the relevant national regulations.  
(Strategy: regulatory; fulfilment of objectives: b, f, g, m)
- k) Ensure the development of an analysis of waste prevention for food, including catering facilities and an analysis of the possibility to reduce the weight of food packaging from the perspective of possible legislative changes.  
(Strategy: regulatory, promotional, fulfilment of objectives: b, f, g, m)
- l) Support technically and by awareness campaigns home, community, and municipal composting of biodegradable waste by individuals. Support the programme of home, community, and municipal composting; its implementation in collaboration with municipalities is recommended for inclusion in the Regional waste management plans.  
(Strategy: regulatory; fulfilment of objectives: b, f, h, m)
- m) Ensure the development of an expert study on the possibility of financial incentives for companies using in production "secondary raw materials" and innovate their technologies with the intention to increase the use of "secondary raw materials" in the production. Create an inter-ministry plan for the increased use of "secondary raw materials" in production.  
(Strategy: regulatory; fulfilment of objectives: b, c, d, f, m)

### **Block 3 - Methodological support and voluntary instruments:**

- n) Develop a methodology to carry out a comprehensive evaluation of the Waste prevention programme of the Czech Republic to monitor and assess the progress that has been made.  
(Strategy: regulatory, information, fulfilment of objectives of: b, m)
- o) Develop a methodology for a qualified and quantified evaluation of the food waste stream and an expert study on this waste stream in order to determine the current status, obtain primary data and monitor the effectiveness of prevention measures in the coming years.  
(Strategy: regulatory, information, fulfilment of objectives of: b, g, m)
- p) Develop methodological guidance to balance the composted material in home and community composting in order to evaluate the effectiveness of measures to support the reduction of biologically degradable waste production.  
(Strategy: regulatory, information, fulfilment of objectives of: b, h, m)
- q) Develop a methodology for qualified and quantified evaluation of the production of textiles and clothing and the stream of used and re-used clothing and textile waste in order to determine the current status, obtain primary data and monitor the effectiveness of prevention measures in the coming years.  
(Strategy: regulatory, information; fulfilment of objectives: b, h, m)
- r) Develop an expert analysis of the actual occurrence of hazardous substances and materials in the construction industry with a view to reduce hazardous substances in the construction and demolition waste, and propose their adequate replacement, without compromising the properties of building and construction materials and components.  
(Strategy: regulatory, information, fulfilment of objectives: b, i, k, m)
- s) Develop an expert study on the possible use of the individual materials and structural units of demolished buildings for the original or for a different purpose while maintaining the functionality of the material.  
(Strategy: regulatory, information, fulfilment of objectives of: b, i, k, m)
- t) Create conditions, or implement voluntary agreements in the areas affected by the waste prevention programmes.  
(Strategy: promotional, informational, regulatory, fulfilment of objectives: a, b, c, e, g, h, i, j)
- u) Support and ensure the implementation of environmental management systems for businesses. Provide sufficient information support on various management systems throughout the duration of the Waste prevention programmes.  
(Strategy: promotional, informational, regulatory, fulfilment of objectives: a, b, c, e, g, h, i, j)
- v) Promote the consideration of environmental aspects focusing on waste prevention in public procurement, e.g. take into account the requirements for environmental management systems, environmental labelling of products and services, preference for reusable packaging and others; reflect and prioritize proposals documenting the use of building materials meeting environmental aspects with a focus on waste prevention (environmental management systems, voluntary agreements, environmental labelling);

reflect and prioritize proposals by companies documenting in their activities the use of "secondary raw materials" directly related to a specific contract.

(Strategy: promotional, regulatory, fulfilment of objectives: a, b, c, d, e, i)

#### **Block 4 – Research, experimental development, and innovation:**

w) Support programmes of research, experimental development, and innovation in the use of "secondary raw materials" in production processes, implementation of low-waste technologies and technologies saving primary raw material input and waste prevention technologies, including eco-design and life cycle assessment considerations.

(Strategy: regulatory, information; fulfilment of objectives: a, c, d, k)

x) Ensure inclusion and implementation of food waste prevention agenda in departmental research and in research programmes. Support programmes of research, experimental development and innovation in the field of prevention of waste from food.

(Strategy: regulatory, information, fulfilment of objectives: a, d, g, k)

y) Support programmes of research, experimental development and innovation in the field of waste prevention in order to extend life span of products, reduce the amount of hazardous substances contained in them in relation to the Directive on end-of-life products (packaging, electrical and electronic equipment, batteries and accumulators, cars) and reduce consumption of materials during production.

(Strategy: regulatory, information, meeting the objectives of: a, d, h, i, k)

z) Support programmes of research, experimental development and innovation in the field of sustainable construction and renovation of buildings, reduction of hazardous substances in construction and construction materials, and prevention of construction and demolition waste.

(Strategy: regulatory, information, fulfilment of objectives: a, d, i, k)



## **3.8 Responsibility for the implementation of the Waste management plan of the Czech Republic and the Regional waste management plans and ensuring of monitoring of fulfilment of the Waste management plan of the Czech Republic and Regional waste management plans**

### **3.8.1 Responsibility for the implementation of the Waste management plan of the Czech Republic and the Regional waste management plans, monitoring of fulfilment of the Waste management plan of the Czech Republic and Regional waste management plans and amendments to the Waste management plan of the Czech Republic**

- a) The ministry, regions, municipalities, and waste generators will continuously monitor the creation of conditions for waste prevention and waste management and the fulfilment of the objectives, principles, and measures.
- b) Municipalities will continuously evaluate the municipal system of municipal waste management including the packaging component, the management of mixed municipal waste, separate collection of waste, system for biodegradable municipal waste management, system for construction waste management, and the management of end-of-life product originating from local citizens and participating entities. As a part of this evaluation, the capacity of the waste management system will be assessed, as well as end-of-life products, and measures designed to improve it will be proposed. Municipalities will also evaluate the implementation of the measures of the Waste prevention programme, which are a part of the waste management plan of the municipality (or a union of municipalities).
- c) The regions will continuously, at least within the framework of evaluation of the Regional waste management plan, evaluate the management systems for municipal waste, mixed municipal waste, biodegradable waste, packaging waste, hazardous and other waste, construction waste, and end-of-life products on their territory. The system of separate waste collection and the management of material recoverable components will be evaluated. Within the framework of this evaluation the capacity of the waste management system and the system for end-of-life product management will be assessed and measures for its improvement will be suggested. Also within the evaluation framework of the Regional waste management plan the network of facilities for waste management in the region will be evaluated. The regions also evaluate the objectives and measures of the Waste prevention programme, which are a part of the Regional waste management plan.

- d) The region will use all available instruments and resources to ensure implementation of the Regional waste management plan.
- e) The region evaluates the compliance with the objectives set out in the Regional waste management plan.
- f) The region draws up the report on the status of compliance with Regional waste management plan, with a term every two years, by November 15, for the past two years. Based on the results, it proposes additional measures to support its implementation.
- g) The Ministry will use all available instruments and resources to ensure implementation of the Waste management plan of the Czech Republic.
- h) The Ministry evaluates the compliance with the objectives set out in the Waste management plan of the Czech Republic.
- i) The Ministry within the evaluation framework of the Waste management plan of the Czech Republic will assess the waste management system on the territory of the Czech Republic, the management of municipal waste, of mixed municipal waste, biodegradable waste, the management of packaging waste, hazardous, and other waste, construction waste and of end-of-life products, and of other types of waste. The system of separate collection of waste and management of waste with materially recoverable components will be assessed. As part of this evaluation, the capacity of the waste management system and of the end-of-life product system will be assessed, and measures suggested for its improvement. The network of facilities for waste management in the Czech Republic will be evaluated. The fulfilment of objectives and measures of the Waste prevention programme, which is a part of the Waste management plan of the Czech Republic, will also be assessed.
- j) The Ministry prepares a report on the implementation of the Waste management plan of the Czech Republic, with a term every two years, by December 31 for the past two years. On the basis of the results it proposes additional measures to support its implementation.
- k) The Council for waste management discusses the proposed measures to support the fulfilment of the Waste management plan of the Czech Republic and submits to the Minister of the Environment draft amendments to the Waste management plan of the Czech Republic and draft amendments to the related legislation.

### **3.8.2 Evaluation of the state of waste management and Waste management plan of the Czech Republic**

#### **Evaluation of the state of waste management and Waste management plan of the Czech Republic, including waste Prevention programme of the Czech Republic**

- a) The Ministry regularly evaluates the effectiveness of the Waste management plan of the Czech Republic, of the Waste prevention programme of the Czech Republic and determines the next steps.

- b) The Ministry evaluates the selected set of indicators designed to monitor the fulfilment of the Waste management plan of the Czech Republic and Waste prevention programme of the Czech Republic, the state of waste management in the Czech Republic and proposes modification of the system of indicators.
- c) The Ministry evaluates the instruments used in waste management and establishes the procedure for their application in waste management in the Czech Republic.

### **3.8.3 Set of indicators for assessing the state of waste management in the Czech Republic and fulfilment of the Waste management plan of the Czech Republic and the Regional waste management plans**

#### **3.8.3.1 Set of waste management indicators**

The indicators are the basic indexes that are continuously used to assess the state and development of waste management in the Czech Republic. They are used at the state level, in the individual regions or in smaller territorial units and by waste producers. The indicators allow the monitoring of fulfilment of the stated objectives of waste management plans. The Ministry evaluates the set of indicators for waste management and provides their update. The Ministry develops the methodology for calculating the objectives and targets of waste management plans and establishes the methods for calculating of the individual indicators. For the calculations of the indicators, data from the fundamental source of information of the ministry – the Waste Management Information System will be used. It contains data from the liable entities pursuant to the Waste Act and the to the End-of-life take-back products Act, and other departmental agenda databases.

The basic indicators of the system of indicators enable the evaluation of waste management at national and regional level and are linked to the objectives set out in the binding part of waste management plans. According to the needs, the set of indicators of waste management may be modified or extended by other new supplementary indicators.

##### **3.8.3.1.1 Conceptual principles of individual indicators**

The waste management indicator system will focus on four main areas in which it will be implemented and which will facilitate the management of waste without significant changes in methodologies for monitoring indicators in the reporting period.

These are:

###### **a) Indicators of objectives**

Used for continuous (two-year) evaluation of the objectives of waste management plans at both the national and regional levels.

**b) Descriptive indicators**

Used for continuous (annual) reporting on the status and development of basic indicators of waste management at both national and regional level.

**c) Data for the managerial control of waste management, crisis management, planning, development and support of waste management**

These are the indicators used in the monitoring of instruments that can be used in the managerial control of waste management at the national and regional levels and are focused on the monitoring and evaluation of facilities for waste management.

**d) Data for reporting**

These are used to fulfil the reporting obligations on both the national and international levels.

### **3.9 Ensuring the data base for the evaluation of waste management, the Waste management plan of the Czech Republic and Regional waste management plans**

**Data collection system:**

It is appropriate to use such registration system and such data collection system in the field of waste management, which allows monitoring of the development and identifying the trends in waste management over longer time intervals.

The data collection system in the field of waste management will be set up to ensure data quality, reduce the administrative burden of reporting, accelerate data processing, and help to reduce the error rate of data.

In the Waste Act and in the End-of-life product take-back Act, the record keeping system, reporting, and data collection in the field of waste management will be adjusted.

The Ministry will collect data in the field of waste management in the following period (2015 - 2024), as required by the Waste management plan of the Czech Republic.

**The outputs from the waste register and the collected data must ensure:**

- a) Data for the planning and managerial control of waste management at the level of the state, region (or possibly municipality) and for evaluating fulfilment of the targets and objectives in waste management and in waste management plans.
- b) Data for the evaluation of the obligations arising from the EU directives and regulations, enabling to fulfil all reporting obligations of the Czech Republic with respect to all the relevant European regulations, questionnaires, survey, and international treaties in the field of waste management.
- c) Data for supervisory activities of state administration and local governments in the field of waste management.

**Measures to ensure the data base for the evaluation of waste management and evaluation of the Waste management plan of the Czech Republic and Regional waste management plans:**

- a) Preserve data collection on waste within the competence of the central government authority in the field of waste management and the central body of state administration for statistical service.
- b) Preserve data processing and waste management data evaluation within the competence of the central government authority in the field of waste management and the central body of state administration for statistical service.

**Measures to ensure quality of the waste management data base:**

- a) **Streamline and optimize** data collection and analysis in the field of waste management.
- b) **Create a new methodology** for processing and evaluating data, providing a realistic description of the state of waste management and meeting all of the requirements for data outputs (e.g. trending, sector management, reporting, supervisory activities etc.). The methodology should take into account the statistical evaluation of the data and ensure the objectivity of the outputs.
- c) **Create a system of indicators and their calculation methodology for the comprehensive evaluation of the waste management, Waste management plan of the Czech Republic and Regional waste management plans.** The basic indicators describe truthfully and objectively the state of waste management in the Czech Republic. To set up a complete set of indicators the principles of tracking the individual targets in the binding part of waste management plans will need to be respected. Waste management indicators at the level of the Czech Republic and regions will be evaluated annually. The Ministry will, based on the indicators, evaluate every two years the fulfilment of the Waste management Plan of the Czech Republic. The regions will, based on the indicators, evaluate the fulfilment of the Regional waste management plans every two years.
- d) **Unambiguously define the types of facility and develop methodology for waste management facility monitoring or for monitoring of selected end-of-life products in the Czech Republic.** It is necessary to clearly define the different types of facilities that are operated in the Czech Republic in terms of their activities (e.g. hazardous waste incinerators, composting plants, biogas plants etc.). For this purpose, a new binding facility catalogue will be issued. It is necessary to specify the list of the currently operated facilities. It is necessary to establish minimum technical and operational criteria for each type of facility. It is also necessary to define the indicators monitored at the facility (e.g. type of technology, operated capacity, design capacity etc.). This is connected to the scope of the waste management record keeping in these facilities. It is also necessary to create more transparent record keeping for facilities for the recovery of biodegradable municipal waste (small facilities, community, municipal composting facilities, etc.).
- e) **Establish indicators and methodology for the evaluation of projects supported by the state, the European Union (Operational Programme Environment 2014-2020)**

- f) **Provide a single data output from the Waste Management Information System to the stakeholders.** On the basis of the processed and statistically evaluated primary data a standardized data output on waste management will be created for the Czech Republic, regions, and municipalities with extended competency, which will be provided to the involved entities in an electronic format or a web application will be created allowing users to research basic indicators of waste management for selected localities. In the field of take-back and disposal of end-of-life products standardized data output for the Czech Republic for the individual commodities will also be created.
- g) **Start collecting economic indicators in the waste management sector.** It is necessary to ensure regular monitoring of economic indicators of the waste management sector for the analytical processing of documents and balance sheets, evaluation of the actual costs of waste management in municipalities where these data are needed for the assessment of public support and evaluation of the performance of economic instruments. It is necessary to ensure the collection and subsequent evaluation of the economic indicators of municipal waste management and other segments of waste management in the Czech Republic.

## **4 Directive part**

The Directive part of WMP CR lays down the conditions, assumptions, and instruments to achieve the set objectives, targets, the change management system in waste management, the system of compliance monitoring with WMP CR, the legal basis for the objectives, principles, and measures set out in the Binding part, and the set of indicators for monitoring changes in waste management.

### **4.1 Terms and conditions for the fulfilment of the stated objectives of WMP CR**

- a) Stability of the legal environment in the areas influencing waste management.
- b) Stability of the economic environment on a global and national level.
- c) Preparedness to deal with crisis situations and natural disasters in the Czech Republic.
- d) Responsibility of the state for the set targets and objectives of WMP CR, including the objectives and measures of Waste prevention programme of the Czech Republic, which will lead to an increased accountability of the Czech population for the environment and human health in the Czech Republic.

### **4.2 Instruments for enforcement and WMP CR fulfilment supervision**

The targets and objectives, principles, and measures set out in WMP CR are designed to promote waste hierarchy defined in the Waste Act and to establish a long-term strategy for waste management development. For this purpose, the individual instruments will be applied. In creating these instruments, the principles of free movement of goods within the EU single market are respected.

An overview of the currently used instruments applied in regulating waste management is provided in detail in the Analytical part of WMP CR. Most of these instruments will continue to be used for the managerial control of waste management also in the future. The condition for the implementation of certain instruments is their definition and embedding in the new legislation that will regulate waste management in the country. This is essentially the new Waste Act, the laws relating to the take-back of selected end-of-life products and the amendment to the Act on packaging.

**The following instruments are proposed for the managerial control of waste management:**

### **4.2.1 Normative instruments**

- a) The legal system of the Czech Republic, in particular the set of laws and regulations governing the area of environment and waste management and the relevant technical standards (Annex no. 3).

For the sake of clarity, setting and configuration of obligations, as well as considering the new objectives and requirements set by the EU Directives in the field of waste management, the need emerges to adopt a new Waste Act, a new Act on take-back of selected end-of-life products, and the amendment to the Act on packaging, including their implementing regulations.

- b) EU directives on waste management transposed into the Czech legislation, as they become legally effective, and directly applicable EU Regulations (Annex no. 3)

The EU Directives are continuously implemented into the Czech law.

The law of the Czech Republic and strategic documents in the field of waste management are based on the requirements and principles resulting from the relevant European legislation.

- c) Strategic documents of other ministries

Documents linked to waste management e.g. in the area of raw materials policy, energy policy, development and operational programmes etc. A fundamental policy document for the other government sectors and the regions relating to the environment is the State Environmental Policy of the Czech Republic. The other important documents are the following: Strategic Framework for Sustainable Development (SFSD), Raw Material Policy of the Czech Republic, Secondary raw materials policy, State Energy Policy of the Czech Republic etc.

- d) Balance sheets and capital investment strategy, financing models

- e) Regional waste management plans and waste management plans of municipalities or associations of municipalities

Regional waste management plans and waste management plans of municipalities or waste management plans of the association of municipalities processed in connection with the WMP of the Czech Republic.

- f) Application of supervisory powers by the public administration

The majority of the existing obligations under the Waste Act may be generally supervised. It is necessary to improve the conditions for the supervising bodies and strengthen the practical implementation of the supervisory powers of the administrative authorities concerned.



## 4.2.2 Economic instruments

### a) Fees for depositing waste in a landfill

A fee will be imposed on depositing waste and other materials to landfills. The fee-payer will be the person who passes the waste on to the landfill operator. The collector of the fee will be the operator of the landfill. The landfill operator will pay the fee to the beneficiaries of charge. The fee is collected in accordance with the quantity of waste material deposited on a landfill in the respective fee period. No value-added tax will be applied to the fee.

The fee will be defined for “other” as well for hazardous waste.

In view of the fact that the beneficiary currently receiving the basic component of the fee is the municipality in whose territory the landfill operates, these municipalities anticipate this income from the fee for depositing waste in landfills in their budgets, the new fee will include a compensation component, which will become an income of the municipality where the landfill is located, and this component will be retained in a reduced form. The beneficiary of the other components of the fee will be the State Environmental Fund.

For hazardous waste, the current risk component of the waste will be greatly reduced, so as to be comparable with the fees for depositing hazardous waste at a landfill in the other European Union states.

For waste that will be from 2024 prohibited from being deposited in landfills, the fee will be gradually increased so that a gradual decrease in the quantity of this waste deposited at landfills is achieved.

Waste and materials being deposited at a landfill as technological material for technical securing of landfills (TSL) will be to a certain quantity exempted from the fee. The maximum amount of waste and materials that will be so exempt will be determined as a percentage of weight. Hazardous waste and materials being sent to landfill as technological material for technical reclamation of landfill will then be charged at a fee corresponding to the risk component to prevent purposeful reporting of hazardous waste as TSL. Similar restrictions on exemption from fees will also be applied to waste prohibited from landfilling from 2024.

Charges will be set in such manner to support diversion of the waste from landfilling towards recovery methods in accordance with the waste hierarchy. The amount of the fee will be established in the new law on waste. Financial means collected from the fee for landfilling, with the exception of the compensation components, will be used for the development of waste management in the Czech Republic and towards achieving the objectives of WMP CR and to ensure proper waste management for waste whose originator is unknown or has expired.

### b) The financial reserve for rehabilitation, restoration, and follow-up care after landfill closure pursuant to the Waste Act

The reserve is created by the landfill operator as a part of his expenses. This is a promising and positively acting instrument. In the new Waste Act and its implementing

regulations the manner of creation and use of the financial reserves will be provided. The size of the financial reserve will be increased.

c) Extended producer economical responsibility

Natural persons carrying out business and legal entities manufacturing or putting into circulation selected products in the Czech Republic, have established specific obligations to take-back end-of-life products, the obligation to provide certain information, obligation to finance certain activities, obligations of subsequent waste management and fulfilment of the defined percentage of recovery and recycling.

d) Financial collateral and insurance of the first phase of landfill operation pursuant to the Waste Act

The Waste Act provides for liability insurance for damage to the environment and human health caused by the landfill operation. The operator has an obligation to deposit at a special account an amount equal to the cost of elimination of the potential damages to be determined by an expert statement. The operator has an obligation to provide collateral issued by a legal person authorized to provide such collaterals covering the potential cost of eliminating the damage.

e) Advances for returnable packaging pursuant to the Packaging Act

The current system of advances for returnable packaging will be retained because of its motivational function (stimulation of both consumers and producers).

f) Fee to support the collection, treatment, recovery, and disposal of selected wrecked cars

The fee is payable upon the first registration of a used vehicle of categories M1 and N1 in the Czech Republic. If the vehicle is already registered in the CR, payment is due at the first re-registration of the vehicle. This fee is intended to prevent the import of old vehicles into the CR and to accelerate the retirement of old vehicles that are the most significant air polluters. The fee is currently used to support the environmental processing of wrecked cars in the form of a 500 CZK contribution per environmentally friendly processing of wrecked car in a facility that is registered in the programme. The new legislation includes the intention to expand the usage of the fee to support the collection of wrecked cars and provide a subsidy to physical persons at the handover of the wrecked car. The new legislation also allows for a charge for Euro 3 emission standard.

g) Fines pursuant to the Waste Act and the Packaging Act, the Municipalities Act, the Offense Act

The new Waste Act will provide strengthened sanctioning powers for the supervisory authorities. Moreover, given the fact that during the supervisory work of administrative bodies often less serious breaches of statutory obligations are found (e.g. administrative offenses or offenses that do not have a significant impact on the environment), the administrative authorities will be enabled to impose fines and corrective actions without concomitant imposition of a pecuniary penalty. It is an effective and environmentally beneficial tool.

h) Payments for the operation of municipal waste management system

The Waste Act will retain the possibility to charge the citizens (reimbursement of costs associated with the management of municipal waste) in the form of a contract. Also retained will be the local fee for the operation of municipal waste management system pursuant to Act no. 565/1990 Coll., on local fees, but will be further amended. The set-up of the local fee will also allow the establishment of reliefs and exemptions, which may be taken into account e.g. the social situation of different groups of people, etc. The municipality will be able to set the fee for individual taxpayers with regard to their waste production and the degree of its sorting. The fee will be defined by the municipality and the municipality will claim the fee, otherwise the fee will be charged in the process mode of the Tax Code.

i) Support from the SEF CR (waste management)

Support is assumed in the form of loans, grants, and partial payments of interest focused on waste management.

j) Support from the state budget (primarily the collection and transport of waste)

The state budget is in terms of volume of financing the most important central source of environmental funding from public sources, also in waste management. The provided funds are especially constructed to co-finance projects for environmental protection supported by EU funds, grants, repayable financial assistance (interest-free loans) and collaterals for commercial loans. There are ongoing transfers of funds to local budgets and SEF. This instrument will continue to be used.

k) Expenditures from local budgets (primarily for the collection and transportation of municipal waste)

Expenditures from local budgets for environmental protection represent a significant source of public financing of waste management in compliance with the principle of subsidiarity. Waste management belongs to the most supported areas in the long term. The local budgets supported primarily projects of smaller financial scale. This instrument will continue to be used.

l) Support from EU programmes and funds

The Czech Republic draws on resources from the EU funds, which are the basis of European structural policy and help to promote balanced and sustainable development of all member countries. In particular, this is mainly within the framework of Operational Programme Environment (OPE). The new 2014+ OPE will support investments important for the development of waste management sector and for the implementation of the objectives of WMP CR and commitments towards the EU.

m) Tax relief (for selected activities and commodities)

The use of this instrument may be considered, although the tax reliefs are of limited effectiveness, their application is a political decision and they are challenging to administratively process.

n) Other subsidies and grants provided by other ministries

It is possible to use other funds for the development of waste management from the grants, loans, business support programmes, programmes for remediation of damage to the environment, etc.

### 4.2.3 Administrative instruments

a) Ensuring uniform exercise of state administration in the field of environmental law (waste management)

The new amended Waste Act and its related implementing regulations will contribute to the unification of state administration exercise in waste management.

b) Increasing the professional qualification of employees in public administration in the field of waste management and related areas

Professional training of public administration staff in the waste management sector will be retained as a part of the management system of the Ministry of the Environment. The aim is to unify the interpretation of the Waste Act and its implementing regulations at the regional offices and authorized municipalities. Methodological guidance by the Ministry of Environment will be strengthened.

c) Strengthening the powers of the Czech Environmental Inspection and other inspection bodies of state administration

Ensure optimal conditions for the efficient performance of supervisory activities by a sufficient professional and personal capacity, financial and technical background, etc. The improvement of conditions for the supervisory body activities should be provided by newly amended the Waste Act.

d) Support of desirable activities leading to the prevention of waste, reduction of the amount and hazardous properties

Adopt instruments for the implementation of the measures proposed in the Waste prevention programme of the Czech Republic, e.g. the methodological recommendations how to embed the relevant criteria in public tenders announced by public administration authorities, etc.

e) Preference for products made from recycled materials and environmentally friendly products in public procurement of all levels of public administration

In 2010, the government adopted the "Rules for applying environmental requirements in public procurement and purchases by state administration and local governments", which obliges the central bodies of public administration to apply environmental requirements to all procurement in selected product groups. Further application of this instrument is assumed.

f) Professional expertise to support the exercise the state and public administration

The training needs of the state administration and the Ministry of Environment are currently managed through public procurement within the announced programmes (e.g. programme Beta) by the Technology Agency of the Czech Republic.

Development of other specialized documents in waste management needed for the performance of state and public administration is arranged through procurement in accordance with the Act no. 137/2006 Coll., on public procurement, as amended, and with the internal regulations of the organizations.

At present, the Czech Environmental Information Agency (CENIA), a state co-financed organization, provides technical support to the Ministry of Environment and manages data on waste management.

g) Support for research, experimental development and innovation

The support for applied research and development to the central government is from 2011 provided through the Technology Agency of the Czech Republic (TA CR). TA CR is a state organization, which was established in 2009 by Act no. 130/2002 Coll., on the support for research, experimental development and innovation. TA CR ensures the preparation and implementation of programmes of applied research, development and innovation, including programmes for the public administration, public tenders in research, development, and innovation to support projects and public procurement.

h) Council for waste management (the "Council") as an advisory body to Ministry of the Environment

The Council for waste management was established by the order of the Minister no. 34/2004. The Council, as an advisory body established to coordinate the planning of waste management at the national level, is expected to continue. The Board members are appointed by the minister of environment.

The Council discusses waste management planning at the national level; the Minister submits proposals to update WMP CR and amendments to the related legislation.

## 4.2.4 Information instruments

a) Programme of information to support the execution of public administration in waste management, Extended information strategy of the Ministry of Environment for the years 2008 - 2014

The strategy has been processed for the period until the year 2014. The created organizational framework and strategic management of information resources, support and services significantly improves the quality of the information system of the environmental sector. The focus of the strategy is to achieve a high degree of electronic services, building of support for the provision of information services in the environmental sector and evaluating the effectiveness of the policy instruments of environmental protection.

b) Information services in the environmental field, databases, periodicals, and other sources of information,

The Ministry of Environment is the publisher and manager of several information sources (e.g. the Waste management information system), which provides the latest information in the field of waste management.

The current level of information services is of a high quality and meets the needs of waste management. This instrument will continue to be used.

c) Communication strategy for waste management

The basis of the communication strategy is the "Action Plan for Environmental Education and Awareness for the years 2010 - 2012 with an outlook to 2015". The general objective of the Action Plan is to implement environmental education. The framework of the communication strategy of the environmental sector will include media promotion of proper municipal waste management focused on the active participation of the public in sorting and recycling and on positive perception of the recovery of municipal waste. General communication campaigns will be prepared by the regions in relation to the actual regional waste management solutions.

d) Public hearings system in the EIA/SEA process framework

The assessment of the environmental impact (EIA process, SEA process) is regulated by the Act no. 100/2001 Coll., on environmental impact assessment, as amended. The processes of EIA and SEA public hearings are commonly used also in waste management. The purpose of the assessment is to identify, describe, and evaluate in complexity the expected impacts of upcoming plans and concepts on the environment and public health in all critical respects.

e) Information systems of all ministries and other state administration authorities intended to inform the public

Use the available sources of information to fulfil the objectives of WMP CR according to specific needs, the support and services of the other ministries and government administration institutions may also be utilized.

## 4.2.5 Voluntary instruments

a) Voluntary agreements in the field of waste management and other related areas helping to achieve compliance with the obligations

Voluntary agreements will be concluded when it is necessary to achieve a greater effect on the environment (fulfilment of obligations beyond the statutory requirements). The basic principle, on which the voluntary agreements are founded, is negotiation. It is assumed that voluntary agreements and cooperation agreements will continue to be concluded in order to protect and improve the environment in the Czech Republic and the development of modern and efficient public administration.

b) Voluntary tools to improve the performance of business entities in waste management

The basic voluntary instruments applied in the Czech Republic, for which the various government programmes have been approved, are the National programme EMAS, the National Cleaner Production Programme, and the National Programme for environmental labelling. The most widespread voluntary instruments in the Czech Republic are the certifications of Environmental Management System EMS according to

the international standard ISO 14001 or EMAS. MoE will continue to support the implementation of EMAS.

A very important voluntary instrument for quality improvement in waste management is the special departmental certification for Waste Management - Professional company for waste management. This certification goes beyond ISO 9001, 14001 and EMAS. MoE will fully support the further implementation of this certification.

The Czech Republic will continue to participate in international projects and activities aimed at promoting cleaner production, energy savings and eco-innovation.

MOE will promote the environmental labelling (eco-labelling), environmental claims of the manufacturer and environmental product declaration. The aim is to expand the voluntary tools into practice, increase promotional and marketing activities, and intensify cooperation with business associations and consulting sector.

- c) Voluntary agreements with operators of facilities for waste management for the purpose of issuance of an integrated permit for the facility, not subject to Annex no. 1 of Integrated Pollution Prevention Act.

MoE supports all activities of facility operators to improve the environment and human health.

- d) Other forms of voluntary activities of enterprises, particularly sectoral programmes

Deepening of cooperation with business entities in the environmental area in order to reduce the amount of waste and hazardous waste properties belong among the priorities of the sector.

## **Annexes:**

Annex no 1: Overview of the objectives set out in the Waste management plan of the Czech Republic

Annex no. 2: Set of waste management indicators

Annex no. 3: Czech Republic and EU waste management legislation and standards

Annex no. 4: List of Abbreviations

Annex no. 5: References



## Overview of the objectives set out in the Waste management plan of the Czech Republic

Table 50: Overview of WMP CR objectives

Serial number	Location in WMP CR Chapter	Definition of targets/objectives	Type of target/objective
1.	3.1	Waste prevention and reduction of specific waste production.	Strategic
2.	3.1	Minimize unfavourable effects of the generation and management of waste on human health and the environment.	Strategic
3.	3.1	Sustainable development of the society and move towards the European "recycling society".	Strategic
4.	3.1	Maximum recovery of waste as a substitute for primary resources and the transition to a circular economy.	Strategic
5.	3.3.1.1	By the year 2015, introduce separate collection for at least waste paper, plastics, glass, and metals.	Main objective
6.	3.3.1.1	By the year 2020, increase to at least 50% by weight, the overall level of preparing for re-use and recycling of waste from at least such materials such as paper, plastic, metal, glass, coming from household waste and possibly of other origin, if these waste streams are similar to waste from households. Successive values for the specified years: (2016 - 46%, 2018 - 48%, in 2020 - 50%)	Main objective
7.	3.3.1.1.1	Use mixed municipal waste (after separating materially recoverable components, hazardous substances and biodegradable waste) especially for energy recovery in facilities designed for this purpose in accordance with current legislation.	Main objective
8.	3.3.1.3	Reduce the maximum quantity of biodegradable municipal waste deposited at landfills in such a way, so that the share of this component would be in the year 2020 at maximum 35% by weight of the total quantity of biodegradable municipal waste produced in 1995.	Main objective

9.	3.3.1.4	Increase by the year 2020, at least to 70% by weight, the rate of preparing for re-use and the recycling rate of construction and demolition waste and other types of their material recovery, including backfilling, in which materials are replaced in accordance with the applicable legislation by construction and demolition waste of the category "other", excluding the naturally occurring material defined in the Waste Catalogue under the catalogue number 17 05 04 (soil and stones).	Main objective
10.	3.3.1.5	Reduce the specific production of hazardous waste.	Main objective
11.	3.3.1.5	Increase the share of re-used hazardous waste.	Main objective
12.	3.3.1.5	Minimize the negative effects of hazardous waste management on human health and the environment.	Main objective
13.	3.3.1.5	Reclaim contaminated sites with hazardous waste presence	Interim target
14.	3.3.1.6.1	Increase the overall packaging recycling to the level of 70% by the year 2020. Increase the overall recovery of packaging waste to the level of 80% by the year 2020. Increase the recycling of plastic packaging to the level of 50% by the year 2020. Increase the recycling of metal packaging to the level of 55% by the year 2020. Achieve 55% overall recovery of consumer sale packaging by the year 2020. Achieve 50% recycling of consumer sales packaging by the year 2020.	Main objective
15.	3.3.1.6.1	In the years 2015-2020 achieve the rate of recycling and recovery of packaging waste in the values listed in Table. 40.	Interim target
16.	3.3.1.6.2	Achieve high level of separate collection of waste electrical and electronic equipment.	Main objective
17.	3.3.1.6.2	By December 31, 2015 achieve the level of separate collection of waste electrical and electronic equipment per citizen per calendar year in the value provided in Table no. 41	Interim target
18.	3.3.1.6.2	In the years 2016 to 2021 achieve the minimum level of collection of waste electrical and electronic equipment provided in Table no. 42.	Interim target
19	3.3.1.6.2	Ensure high level of recovery, recycling and preparing	Main

		for re-use of electric and electronic waste.	objective
20.	3.3.1.6.2	In the years 2015 to 2018 achieve the desired % of recovery, recycling and preparing for re-use of the total weight of electric and electronic waste processed in the collected waste electrical and electronic equipment, see Table. 43.	Interim target
21.	3.3.1.6.2	From the year 2018 achieve the desired rate (%) of recovery, recycling and preparing for re-use of the total weight of electric and electronic waste processed in the collected waste electrical and electronic equipment, see Table. 43.	Interim target
22.	3.3.1.6.3	Increase the level of separate collection of waste portable batteries and accumulators.	Main objective
23.	3.3.1.6.3	In the years 2015 to 2016 to achieve the desired level of separate collection of waste portable batteries and accumulators, see Table no. 45 (2016 - 45%)	Interim target
24.	3.3.1.6.3	Achieve high recycling efficiency of the recycling processes of waste batteries and accumulators.	Main objective
25.	3.3.1.6.3	Achieve In the long term the required recycling efficiency of the recycling processes of waste batteries and accumulators. The minimum recycling efficiency for the recycling of output fractions of the recycling process out of the total weight of waste batteries and accumulators entering the recycling process, see Table no. 46.	Interim target
26.	3.3.1.6.4	Achieve a high rate of recovery when processing end-of-life vehicles (wrecked cars).	Main objective
27.	3.3.1.6.4	In the year 2015 and onwards achieve the required % in recovery, recycling and re-use in the processing of selected end-of-life vehicles (selected wrecked cars) see Table no. 47.	Interim target
28.	3.3.1.6.5	Increase the level of separate collection of waste tyres.	Main objective
29.	3.3.1.6.5	Achieve the required level of collection of tyres, see Table no. 48. (2016 - 35%, and in 2020 and onwards - 80%)	Interim target
30.	3.3.1.6.5	Achieve high recovery rate in processing waste tyres.	Main objective
31.	3.3.1.6.5	From the year 2018 and onwards, achieve the desired % of recovery, recycling and re-use in the processing of waste tyres, see Table no. 49. (2016 and onwards - 100%)	Interim target

32.	3.3.1.7	Support technologies for the recovery of sludge from municipal wastewater treatment plants.	Main objective
33.	3.3.1.8	Increase the material and energy recovery of waste oils.	Main objective
34.	3.3.1.9	Minimize negative effects of waste management from medical and veterinary care on human health and the environment.	Main objective
35.	3.3.2.1	Forward all equipment and waste containing polychlorinated biphenyls by the end of 2025 to authorized persons, or by this time decontaminate facilities and waste containing polychlorinated biphenyls.	Interim target
36.	3.3.2.1	Dispose of waste containing polychlorinated biphenyls held by persons authorized for waste management by the end of the year 2028.	Interim target
37.	3.3.2.2	Raise awareness of persistent organic pollutants and their effects on human health and the environment.	Interim target
38.	3.3.2.2	Monitor the occurrence of persistent organic pollutants especially in waste listed in Annex V of the European Parliament and Council Regulation (EC) no. 850/2004 on Persistent Organic Pollutants, as amended by Commission Regulation (EU) no. 756/2010.	Interim target
39.	3.3.2.3	Minimize the potential negative effects in the management of waste containing asbestos on human health and the environment.	Main objective
40.	3.3.2.4	Minimize the potential negative effects in the management of waste containing natural radionuclides on human health and the environment.	Interim target
41.	3.3.3.1	Reduce the quantity of biodegradable waste from kitchens and canteens and animal by-products in mixed municipal waste, which are originally from public catering establishments (restaurants, snacks) and central kitchens (hospitals, schools and other similar facilities.)	Interim target
42.	3.3.3.1	Properly manage biodegradable waste from kitchens and canteens and animal by-products and reduce the negative effects associated with the management of waste on human health and the environment.	Interim target
43.	3.3.3.2	Process metal waste and end-of-life products into materials replacing primary raw materials.	Interim target
44.	3.4	Create and maintain a comprehensive, adequate and	Main

		effective network of waste management facilities in the Czech Republic.	objective
45.	3.5	Do not endanger human health and the environment in the Czech Republic by transboundary movement of waste.	Main objective
46	3.6	Reduce waste deposition outside the specified points.	Interim target
47.	3.6	Ensure proper management of waste deposited outside the specified locations and of waste whose owner is unknown or has expired.	Interim target
48.	3.7	Create by a coordinated and unified approach the conditions for lower consumption of primary resources and the gradual reduction of waste production.	Main objective
49.	3.7	Throughout the implementation of the Waste prevention programme provide comprehensive information support on the subject, including the introduction of the waste prevention agenda into school curricula, research and educational programmes, cultural and educational activities related to the protection and formation of the environment.	Interim target
50.	3.7	Ensure effective involvement of state administration at all levels in waste prevention agenda to progressively reduce the quantity of waste generated by state administration.	Interim target
51.	3.7	Create conditions and set incentives for reducing raw material and energy resources in manufacturing sectors and increasing the use of "secondary raw materials" in the context of other strategic documents (Mainly the Raw material policy of the Czech Republic and the Secondary raw material policy of Czech the Republic).	Interim target
52.	3.7	Support by all available means the implementation of low waste and innovative technologies saving feedstock materials and support the manufacturing and industry sector in the effort to optimize the processes of production in terms of the Programme's objectives.	Interim target
53.	3.7	At all levels support, promote, and provide information about the available voluntary instruments (voluntary agreements, systems of environmental management, environmental labelling, and cleaner production) with the aim of their gradual expansion.	Interim target

54.	3.7	In connection with the individual Programme objectives, with the objectives and targets of other programmes and environmental policies and the requirements of European Union bodies, ensure the appropriate legislative environment for the implementation of the Programme.	Interim target
55.	3.7	Focus maximum attention on food waste and create conditions for the gradual reduction of this waste at all levels of the food cycle (food production phase including marketing and consumption).	Interim target
56.	3.7	Create conditions to stabilize the production of individual components of municipal waste and their subsequent reduction at all levels of local public administration and the people.	Interim target
57.	3.7	In conjunction with other strategic documents create conditions to stabilize the production of hazardous waste, construction and demolition waste, textile waste and waste from product directives, with an outlook of their factual reduction in the coming years.	Interim target
58.	3.7	Support the use of service and charity centres and organizations for the purpose of extending life span and re-use of products and materials.	Interim target
59.	3.7	Increase the active role of research, experimental development and innovation in support of the Programme of waste prevention.	Interim target
60.	3.7	Increase the efficiency of promotion of waste prevention activities and activities of the collective systems and product take-back collection systems.	Interim target
61.	3.7	Develop the required analytical documents and assessment instruments to evaluate the effectiveness of the Waste prevention programme and for the assessment of progress made in prevention sub-objectives and measures.	Interim target

## Annex no. 2

# Set of waste management indicators

Table 51: Overview of basic indicators for assessing the status of waste<sup>23</sup> management.

Indicator Type	Category	Description	Purpose	Indicator definition	Data Source
POH Objectives	National/Regional	<b>Share of municipalities that provide separate collection of four components</b> (glass, paper, plastic, metals) municipal waste.	Monitor the objective/target of developing separate collection of paper, plastic, glass and metals in municipal waste.	Indicator expressed in (% of municipalities) and in (% of population).	WMIS, reports on production and waste management. Reports of waste originators - municipalities under the new legislation in the field of waste management. Determining the management status in communities without obligation to notify the region.
	National/Regional	<b>Rate of recycling paper, plastic, glass, metals contained in municipal waste.</b>	Monitor the objective/target to ensure the preparation for re-use or recycling 50 % paper, plastic, glass, metals originating from household waste and possibly of other origin, if these waste streams are similar to waste from households.	Indicator expressed in (%).	WMIS, reports on production and waste management (where applicable statistical computation of non-declared waste). Reports of waste originators - municipalities under the new legislation in the field of waste management. The analysis of municipal waste composition from municipalities according to methodology adopted for the identification of recyclable components in municipal waste from municipalities (to be determined 1x every three years).

<sup>23</sup> This list will then be extended to other indicators based on the outcomes of the meetings of the working group established to create a system of indicators of waste management.

National/ Regional	<b>Quantity of BDMW deposited to landfills.</b>	Monitor the objective/target to gradually reduce the amount of biodegradable municipal waste landfilled (in comparison with waste generated in 1995).	Relative to the quantity of biodegradable municipal from communities. (by conversion by share of BDW in MW)  Indicator expressed in (t/year) and (kg/inhabitant /year).	WMIS, reports on production and waste management. Reports of waste originators - municipalities under the new legislation in the field of waste management. The share of BDMW in waste will be determined 1x every three years), based on the methodology adopted for waste analysis.	
National/ Regional	<b>Share of BDMW landfilled relative to the reference base 1995</b>	Monitoring of the objective/target to reduce the quantity share of BDMW landfilled by the year 2020 relative to BDMW produced in 1995.	Relative to the quantity of BDMW from communities.  Indicator expressed in (%).	WMIS, reports on production and waste management. Reports of waste originators - municipalities under the new legislation in the field of waste management. The share of BDMW in waste will be determined 1x every three years), based on the methodology adopted for waste analysis.	
National/ Regional	<b>Recovery rate and material recovery of construction and demolition waste.</b>	Monitor the objective/target to increase recycling and material recovery of construction and demolition waste to the level of 70% by the year 2020.	Indicator expressed in (%).	WMIS, reports on production and waste management. Reports from facility operators under the new legislation.	
National	<b>Rate of recovery and recycling of packaging waste.</b>	Monitoring compliance with objectives/targets for recycling and recovery of packaging according to the Act on packaging and WMP CR.	Indicator expressed in (%).	Records according to the Packaging Act (statement of EKO-KOM a.s.), reports on the extent and manner of keeping records on packaging and reporting data from these records - implementing regulation to the Act on packaging.	



	National	<b>Rate of recovery and recycling of consumer packaging waste.</b>	Monitoring compliance with objectives/targets for recycling and recovery of packaging according to the Act on packaging and WMP CR.	Indicator expressed in (%).	Records according to the Packaging Act (statement of EKO-KOM a.s.), reports on the extent and manner of keeping records on packaging and reporting data from these records - implementing regulation to the Act on packaging.
	National	<b>Electrical and electronic equipment</b>  <b>Rate of separate collection</b> of waste electrical and electronic equipment (WEEE).	Monitoring of compliance with objective/targets to achieve the minimum required level of separate collection of WEEE.	Indicator expressed in (kg/ inhabitant/ year) and in (%).	The annual reports on the implementation of take-back obligations and separate collection of WEEE. WMIS. Evidence and reporting according to the new legislation.
	National	<b>Electrical and electronic equipment</b>  <b>Recovery rate, recycling and preparation for re-use</b> of waste electric and electronic equipment.	Monitoring of compliance with objective/target to achieve the minimum level of recycling and recovery of electric and electronic waste.	Indicator expressed in (%).	The annual reports on the implementation of take-back obligations and separate collection of WEEE. WMIS. Evidence and reporting according to the new legislation.
	National	<b>Batteries and accumulators</b>  <b>Level of separate collection</b> of waste portable batteries and accumulators.	Monitoring of compliance with objective/target to achieve the minimum required level of separate collection of waste portable batteries and accumulators.	Indicator expressed in (%).	The annual reports on the implementation of take-back obligations and separate collection of waste batteries and accumulators. WMIS. Evidence and reporting according to the new legislation.
	National	<b>Batteries and accumulators</b>  <b>Recycling efficiency of the recycling processes</b> of waste batteries and accumulators.	Monitoring of compliance with the objective/target to achieve efficiencies of the recycling processes of waste batteries and accumulators for different types of batteries and accumulators (lead-acid, nickel-cadmium batteries,	Indicator expressed in (%).	The annual reports on the implementation of take-back obligations and separate collection of waste batteries and accumulators. WMIS. Evidence and reporting according to the new legislation.

			other batteries and accumulators).		
	National	<b>End-of-life vehicles (wrecked cars)</b>  <b>The rate of recovery, recycling and re-use</b> in the processing of end-of-life vehicles (wrecked cars).	Monitoring of compliance with the objective/target for recovery rate, recycling and re-use of end-of-life vehicles (wrecked cars).	Indicator expressed in (%).	The annual reports of manufacturers and accredited representatives of selected vehicles on achievement of the targets set out in the Act. WMIS. Evidence and reporting according to the new legislation.
	National	<b>Tyres</b>  <b>Level of separate collection</b> of waste tyres.	Monitoring of compliance with objective/target to achieve minimum level of separate collection of tyres.	Indicator expressed in (%).	WMIS. Evidence and reporting according to the new legislation.
	National	<b>Tyres</b>  <b>Rate of recovery, recycling and re-use</b> in the processing of waste tyres.	Monitoring of compliance with objective/target for recovery, recycling and re-use of waste tyres.	Indicator expressed in (%).	WMIS. Evidence and reporting according to the new legislation.
Descriptive	National/ Regional	<b>Waste production</b>  <b>(total, other waste, hazardous waste, municipal waste, municipal waste from municipalities)</b>	Monitoring developments in the quantity of waste production by individual groups (other, hazardous, municipal, and municipal from communities).	Indicator expressed in (t/year) and in (kg/ inhabitant/ year).	WMIS, reports on production and waste management. Reports of waste originators and authorized persons under the new legislation in the field of waste management.
	National/ Regional	<b>MMW production</b>	Monitoring production of mixed municipal waste in the Czech Republic and in the relevant regions.	Indicator expressed in (t/year) and in (kg/inhabitant/ year).	WMIS, reports on production and waste management. Reports from waste originators under the new legislation in the field of waste management.
	National/ Regional	<b>Production (yield) of separate collection of municipal waste</b> (4	Monitoring the yield (production) of separate collection of	Indicator expressed in (t/year).	WMIS, reports on production and waste management. New reports from

		component collection) originating from communities	municipal waste individual components (glass, paper, plastic, metals) originating from the municipalities in the Czech Republic and the relevant region.		originators - municipalities according to new legal standards in the field of waste management. For more exact specification, statistical adjustment of production for municipalities that do not achieve with reporting limit.
National/ Regional	<b>Waste processing/ treatment</b>		Monitoring of developments in the quantity and share of processed/ treated waste according to individual groups (other, hazardous, municipal) and selected types of waste (e.g. mixed municipal waste, bulky waste).	Indicator expressed in (t/yr, %).	WMIS, reports on production and waste management. Reports from waste originators and authorized persons under the new legislation in the field of waste management.
National/ Regional	<b>Waste recovery</b>		Monitoring of developments in the quantity and share of recovered waste according to individual groups (other, hazardous, municipal) and selected types of waste (e.g. mixed municipal waste, bulky waste).	Indicator expressed in (t/yr, %).	WMIS, reports on production and waste management. Reports from waste originators and authorized persons under the new legislation in the field of waste management.
National/ Regional	<b>Waste material recovery</b>		Monitoring of developments in the quantity and share of materially recovered waste according to individual groups (other, hazardous, municipal) and selected types of waste.	Indicator expressed in (t/year, %).	WMIS, reports on production and waste management. Reports from waste originators and authorized persons under the new legislation in the field of waste management.
National/ Regional	<b>Waste recycling</b>		Monitoring of developments in the quantity and share of recycled waste according to individual groups (other, hazardous, municipal) and selected types of	Indicator expressed in (t/yr %).	WMIS, reports on production and waste management. Reports from waste originators and authorized persons under the new legislation in the field of waste

			waste.		management.
National/ Regional	<b>Waste energy recovery</b>	Monitoring of developments in the quantity and share of energy recovered waste according to individual groups (other, hazardous, municipal) and selected types of waste.	Indicator expressed in (t/yr, %).	WMIS, reports on production and waste management. Reports from waste originators and authorized persons under the new legislation in the field of waste management.	
National/ Regional	<b>Waste disposal</b>	Monitoring of developments in the quantity of disposed waste according to individual groups (e.g. mixed municipal, bulky waste) and selected types of waste.	Indicator expressed in (t/yr, %).	WMIS, reports on production and waste management. Reports from waste originators and authorized persons under the new legislation in the field of waste management.	
National/ Regional	<b>Waste incineration</b>	Monitoring of developments in the quantity and share of incinerated waste according to individual groups (other, hazardous, municipal) and selected types of waste.	Indicator expressed in (t/yr, %).		
National/ Regional	<b>Waste landfilling</b>	Monitoring developments in the quantity and share of landfilled waste by individual groups (other, hazardous, municipal) and selected types of waste.	Indicator expressed in (t/yr, %).		
National/ Regional	<b>Capacity of facilities</b>	Monitoring the development of the capacities of individual types of facilities (according to the Catalogue of facilities).	The indicator is expressed according to the type of facility in (t), in (m3).	Reports of the regional authority or municipal authority with extended competency on issued approvals and other decisions. Reports by authorized persons - operators of facilities under the new legislation in the field of waste management.	
National/ Regional	<b>Number of facilities</b>	Monitoring the number of different types of facilities	Indicator will be expressed according to the type of facility	Reports of the regional authority or municipal authority	

			(according to the Catalogue of facilities).	(units).	with extended competency on issued approvals and other decisions. Reports by authorized persons - operators of facilities under the new legislation in the field of waste management.
	National/ Regional	<b>BDW and BDMW production</b>	Monitoring of production of BDW and BDMW the Czech Republic and the individual regions.	Indicator expressed in (t/year).	WMIS, reports on production and waste management. Reports from waste originators under the new legislation in the field of waste management.
	National/ Regional	<b>Production of bulky waste</b>	Monitoring the production of bulky waste on the territory of the individual region.	Indicator expressed in (t/year), (kg/ inhabitant/ year).	WMIS, reports on production and waste management. Reports from waste originators under the new legislation in the field of waste management.

Source: Ministry of the Environment

Note. The method of calculating the indicator will subsequently be developed on the basis of the working group sessions established after the adoption of WMP CR.

# Czech Republic and EU waste management legislation and standards

## Legislation and standards in selected areas of Waste Management<sup>24</sup> in the Czech Republic and the EU:

### 1. Acts:

Act no. 185/2001 Coll., on waste and amending certain other acts

Act no. 477/2001 Coll., on packaging and amending certain laws (Act on Packaging)

Act no. 157/2009 Coll., on waste mining waste and amending certain laws

Act no. 258/2000 Coll., on the protection of public health and related regulations

Act no. 254/2001 Coll., on waters and amending certain laws (Water Act)

Act no. 274/2001 Coll., on water supply and sewerage systems for public use and amending certain laws (Water supply and sewerage Act)

Act no. 201/2012 Coll., on Air Protection

Act no. 100/2001 Coll., on environmental impact assessment and amending certain related acts (Environmental impact assessment Act)

Act no. 350/2011 on chemical substances and mixtures and amending certain laws (Chemical Act)

Act no. 76/2002 Coll., on integrated pollution prevention and control, integrated pollution register and amending certain laws (Integrated Prevention Act)

Act no. 25/2008 Coll., on integrated register of environmental pollution and integrated system of reporting obligations in the field of environment and amending certain laws

Act no. 56/2001 Coll., on conditions for operating vehicles on roads and amending Act no. 168/1999 Coll., on liability insurance for damage caused by vehicles and amending certain related acts (Vehicle insurance), as amended by Act no. 307/1999 Coll.,

Act no. 17/1992 Coll., on the environment

Law of the Czech National Council no. 114/1992 Coll., on Nature and Landscape Protection

Act no. 183/2006 Coll., on spatial planning and building code (Building Act)

Act no. 123/1998 Coll., on the right to information on the environment

Act no. 106/1999 Coll., on free access to Information

Czech National Council Act no. 388/1991 Coll., on the State environmental fund of the Czech Republic

Czech National Council Act no. 282/1991 Coll., on the Czech environmental inspection and its jurisdiction in forest protection

Act no. 563/1991, on accounting, as amended

Act no. 586/1992 Coll., on income taxes, as amended

Act no. 593/1992 Coll., on reserves for assuring income tax base, as amended

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<sup>24</sup> The list of applicable legislation in the environmental sector contains is provided in the Bulletin of Ministry of the Environment, Volume XIII, February 2013, parts 1 and 2

Act no. 235/2004 Coll., on value added tax, as amended

## **2. Decrees:**

Decree no. 381/2001 Coll., Laying down the Catalogue of Waste, List of Hazardous Waste and lists of waste and countries for the purpose of export, import and transit of waste and the procedure for granting permission for export, import and transit of waste (Waste Catalogue)

Decree no. 382/2001 Coll., on the conditions of use of treated sludge on agricultural land

Decree no. 383/2001 Coll., on details of waste management

Decree no. 384/2001 Coll., on the disposal of polychlorinated biphenyls, polychlorinated terphenyls, monomethyl, monomethyl, monomethyl and all mixtures containing any of these substances in concentrations greater than 50 mg/kg (Decree on the management of PCBs)

Decree no. 294/2005 Coll., on conditions of landfilling waste and their recovery on the ground surface, and amending Decree No. . 383/2001 Coll., on details of waste management

Decree no. 352/2005 Coll., on details of electrical equipment and electrical waste and detailed conditions of financing of its management (Decree on the management of electrical and electronic equipment)

Decree no. 341/2008 Coll., on details of biodegradable waste management and amending Decree no. 294/2005 Coll., on conditions of waste landfilling and their use on the ground surface and amending Decree no. 383/2001 Coll., on details of waste management (Decree on details of biodegradable waste)

Decree no. 352/2008 Coll., on details of waste management of wrecked cars, selected wrecked cars, the method of maintaining their records and records of waste generated in facilities for the collection and processing of wrecked cars and the information system to monitor streams of selected wrecked cars (Decree on wrecked car details)

Decree no. 374/2008 Coll., on waste shipments and amending Decree no. 381/2001 Coll., laying down the Catalogue of waste, List of Hazardous Waste and lists of waste and countries for export purposes, import and transit of waste and the procedure for granting permission for export, import and transit of waste (Waste Catalogue), as amended

Decree of the Ministry of Industry and Trade no. 116/2002 Coll., on the labelling of returnable packaging

Decree no. 641/2004 Coll., on the extent and manner of keeping records of packaging and reporting data from these records

Decree no. 237/2002 Coll., on details of how to perform the take-back of some products

Decree no. 170/2010 Coll., on batteries and accumulators and amending Decree no. 383/2001 Coll., on details of waste management, as amended

Decree of the Ministry of Environment and the Ministry of Health no. 376/2001 Coll., on classification of hazardous properties of waste

Decree no. 402/2011 Coll., on the assessment of dangerous properties chemicals and chemical mixtures and packaging and labelling of dangerous chemical mixtures

Decree no. 162/2012 Coll., on the formation of hazardous substances name in the marking of a hazardous mixture

Decree no. 163/2012 Coll., on the principles of good laboratory practice

Decree no. 428/2009 Coll., on the implementation of certain provisions of the Mining Waste Disposal

Decree no. 429/2009 Coll., on the requirements for the plan for the disposal of mining waste, including evaluation of its properties and some other details for the implementation of the Law on Mining Waste Disposal

Decree of Czech Mining Office no. 99/1992 Coll., on the establishment, operation, safeguarding and dismantling of facilities for storing waste in underground spaces

### 3. Government Regulation:

Regulation no. 361/2007 Coll., Laying down the conditions occupational health

### 4. Standards<sup>25</sup>:

EN 13965-2	<i>Characterization of waste - Terminology - Part 2: Names and definitions relating to waste management</i>
DIN EN 14899	<i>Characterization of waste - Sampling of waste - Principles of preparation of the testing programme and its use</i>
EN 15002	<i>Characterization of waste - Preparation of test portions of laboratory sample</i>
EN 14735	<i>Characterization of waste - Preparation of waste samples for ecotoxicity tests</i>
EN 12457-1	<i>Characterization of waste - Leaching - Compliance test for leaching of granular waste materials and sludges - Part 1: One stage batch test at a liquid to solid ratio of 2 l/kg for materials with high solid content and particle size below 4 mm (with or without size reduction)</i>
EN 12457-2	<i>Characterization of waste - Leaching - Compliance test for leaching of granular waste materials and sludges - Part 2: One stage batch test at a liquid to solid ratio 10 l/kg for materials with particle size below 4 mm (with or without size reduction)</i>
EN 12457-3	<i>Characterization of waste - Leaching - Compliance test for leaching of granular waste materials and sludges - Part 3: Two stage batch test at a liquid ratios solid phase 2 l/kg and 8 l/kg for materials with high solid content and particle size below 4 mm (without size reduction or him)</i>
EN 12457-4	<i>Characterization of waste - Leaching - Compliance test for leaching of granular waste materials and sludges - Part 4: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size less than 10 mm (with or without size reduction)</i>
CSN P CEN / TS 14405	<i>Characterization of waste – leaching behaviour test - up-flow percolation test with (under specified conditions)</i>
EN 15875	<i>Characterization of waste - Static test for determination of acid-neutralizing potential and the potential of sulfidic wastes</i>
CSN P CEN / TS 15862	<i>Characterization of waste - Compliance leaching test - One stage batch leaching test for monoliths at fixed liquid to surface area ratio (L/A) for test portions with fixed minimum dimensions</i>
CSN P CEN / TS 15863	<i>Characterization of waste - Leaching behaviour test for basic</i>

<sup>25</sup> An overview of selected standards in the field of waste management as of April 30, 2014



	<i>characterisation – Dynamic monolithic leaching test with periodic leachate renewal, under fixed test conditions</i>
<i>CSN P CEN / TS 15864</i>	<i>Characterization of waste - Leaching behaviour test for basic characterisation – Dynamic monolithic leaching test with continuous leachate renewal under conditions relevant for specified scenario(s)</i>
<i>CSN EN 12920 + A1</i>	<i>Characterization of waste - Methodology for determining the leaching behaviour of waste under specified conditions</i>
<i>CSN P CEN / TS 16023</i>	<i>Characterization of waste – Determination of gross calorific value and calculation of net calorific value</i>
<i>EN16377</i>	<i>Characterization of waste - Determination of brominated flame retardants (BFR) in solid waste</i>
<i>EN 16192</i>	<i>Characterization of waste - Analysis of eluates</i>
<i>EN 13656</i>	<i>Characterization of waste. Microwave assisted digestion with hydrofluoric (HF), nitric (HNO<sub>3</sub>), and hydrochloric (HCl) acid mixture for subsequent determination of elements</i>
<i>EN 13657</i>	<i>Characterization of waste. Digestion for subsequent determination of aqua regia soluble portion of elements</i>
<i>EN 14346</i>	<i>Characterization of waste. Calculation of dry matter by determination of dry residue or water content</i>
<i>EN 13137</i>	<i>Characterization of waste - Determination of total organic carbon (TOC) in waste, sludges and sediments</i>
<i>EN 15192</i>	<i>Characterization of waste and soil - Determination of chromium (VI) in solid material by alkaline digestion and ion chromatography with spectrophotometric detection</i>
<i>EN 14582</i>	<i>Characterization of waste. Halogen and sulphur content. Oxygen combustion in closed systems and determination methods</i>
<i>EN 14345</i>	<i>Characterization of waste - Determination of hydrocarbon content by gravimetry</i>
<i>EN 14039</i>	<i>Characterization of waste - Determination of hydrocarbon content in the range of C10 to C40 by gas chromatography</i>
<i>DIN EN 15169</i>	<i>Characterization of waste - Determination of loss on ignition in waste, sludge and sediments</i>
<i>EN 15216</i>	<i>Characterization of waste - Determination total dissolved solids in the water and extracts</i>
<i>CSN EN 15308</i>	<i>CSN EN 15308 - Characterization of waste - Determination of selected polychlorinated biphenyls (PCB) in solid waste by using capillary gas chromatography with electron capture or mass spectrometric detection</i>
<i>EN 15527</i>	<i>Characterization of waste – Determination of polycyclic aromatic hydrocarbons (PAH) in waste using gas chromatography mass spectrometry (GC/MS)</i>
<i>DIN EN 15309</i>	<i>Characterization of waste and soil - Determination of elemental composition by X-ray fluorescence</i>
<i>EN 16123</i>	<i>Characterization of waste - Guidance for selection and use of screening methods</i>
<i>CSN P CEN / TS 16229</i>	<i>Characterization of waste - Sampling and analysis of cyanides separable by weak acid discharged into tailings ponds</i>

CSN EN 2955	<i>Aerospace series - Recycling of waste titanium and titanium alloys</i>
CSN 42 0030	<i>Steel and cast iron waste</i>
CSN EN 12861	<i>Copper and copper alloys - Waste</i>
CSN 42 1331	<i>Waste non-ferrous metals and their alloys</i>
EN 14057	<i>Lead and lead alloys - Waste - Terms and definitions</i>
DIN EN 12258-3	<i>Aluminium and aluminium alloys - Terms and definitions - Part 3: Waste</i>
EN 12258-4	<i>Aluminium and aluminium alloys - Terms and definitions - Part 4: Residues of aluminium industry</i>
EN 13920-1	<i>Aluminium and aluminium alloys - Scrap - Part 1: General requirements, sampling and testing</i>
EN 13920-2	<i>Aluminium and aluminium alloys - Scrap - Part 2: Unalloyed aluminium scrap</i>
EN 13920-3	<i>Aluminium and aluminium alloys - Scrap - Part 3: Waste of wires and cables</i>
EN 13920-4	<i>Aluminium and aluminium alloys - Scrap - Part 4: Scrap consisting of one single wrought alloy</i>
EN 13920-5	<i>Aluminium and aluminium alloys - Scrap - Part 5: Scrap containing two or more wrought alloys the same group of</i>
CSN EN 13920-6	<i>Aluminium and aluminium alloys - Scrap - Part 6: Scrap containing two or more wrought alloys</i>
EN 13920-7	<i>Aluminium and aluminium alloys - Scrap - Part 7: Scrap containing castings</i>
EN 13920-8	<i>Aluminium and aluminium alloys - Scrap - Part 8: Shredded waste containing non-ferrous materials to be separated from aluminium</i>
DIN EN 13920-9	<i>Aluminium and aluminium alloys - Scrap - Part 9: Waste of aluminium after separation from crushed nonferrous materials</i>
EN 13920-10	<i>Aluminium and aluminium alloys - Waste - Part 10: Waste containing used beverage cans from aluminium</i>
DIN EN 13920-11	<i>Aluminium and aluminium alloys - Scrap - Part 11: Waste radiators containing aluminium and copper</i>
EN 13920-12	<i>Aluminium and aluminium alloys - Scrap - Part 12: Chips containing a single alloy</i>
EN 13920-13	<i>Aluminium and aluminium alloys - Scrap - Part 13: A mixture of chips containing two or more alloys</i>
EN 13920-14	<i>Aluminium and aluminium alloys - Scrap - Part 14: Waste from post-consumer aluminium packaging</i>
EN 13920-15	<i>Aluminium and aluminium alloys - Scrap - Part 15: Decoated aluminium scarp from post-consumer packaging</i>
EN 13920-16	<i>Aluminium and aluminium alloys - Scrap - Part 16: Wastes containing swab, foam and overflow coarse particles of metal</i>
DIN EN 14290	<i>Zinc and zinc alloys - Secondary materials</i>
CSN 64 0003	<i>Plastics - Evaluation of plastic waste - Terminology</i>
CSN EN 14987	<i>Plastics - Evaluation of removability of plastic waste in sewage treatment plants - Test plan for final approval and specifications</i>
EN 15342	<i>Plastics - Recycled Plastics - Characterization of polystyrene (PS) recyclates</i>

EN 15343	<i>Plastics - Recycled plastics - Traceability and Conformity Assessment in the recycling of plastics and determination of recycled content</i>
CSN EN 15344	<i>Plastics - Recycled Plastics - Characterisation of Polyethylene (PE) recyclates</i>
EN 15345	<i>Plastics - Recycled Plastics - Characterisation of polypropylene (PP) recyclates</i>
EN 15346	<i>Plastics - Recycled Plastics - Characterisation of polyvinyl chloride (PVC) recyclates</i>
EN 15347	<i>Plastics - Recycled Plastics - Characterisation of plastics wastes</i>
CSN EN 15348	<i>Plastics - Recycled Plastics - Characterisation of polyethylene terephthalate (PET) recyclates</i>
CSN P CEN / TS 16010	<i>Plastics - Recycled plastics - Sampling procedures for testing plastics waste and recyclates</i>
CSN P CEN / TS 16011	<i>Plastics - Recycled Plastics - Preparation of samples</i>
EN 14995	<i>Plastics - Evaluation of compostability - Test scheme and specifications</i>
CSN P CEN / TS 16010	<i>Plastics - Recycled plastics - Sampling procedures for testing plastics waste and recyclates</i>
CSN P CEN / TS 14243	<i>Materials produced from end-of-life tyres - Specification of categories based on their dimension(s) and impurities and methods for determining their dimension(s) and impurities</i>
CSN 65 6690	<i>Waste oil</i>
CSN EN 12940	<i>Waste from the manufacture of footwear - Classification of waste and waste management</i>
CSN 80 1900	<i>Textile wastes. Basic terminology</i>
CSN EN 643	<i>Paper and board - European list of standard types of waste paper and cardboard</i>
CSN 65 6691	<i>Petroleum products - Heating oil-based waste oils - Requirements and test methods</i>
CSN EN 1744-7	<i>Tests for chemical properties of aggregates - Part 7: Determination of loos of ignition of Municipal Incinerator Bottom Ash (MIBA Aggregate)</i>
EN 1744-8	<i>Tests for chemical properties of aggregates - Part 8: Sorting test to determine metal content of Municipal Incinerator Bottom Ash (MIBA) Aggregates</i>
CSN 46 5735	<i>Industrial composts</i>
CSN EN 12832	<i>Characterization of sludge - Utilization and disposal of sludge - Vocabulary</i>
CSN 75 8084	<i>Instructions to sustain and expand the uses and disposal of sludge</i>
CSN 75 8085	<i>Guidelines for the use of sludge in the reclamation of land</i>
CSN P CEN / TS 16177	<i>Sludge, treated bio-waste and soil - Extraction for determination of leachable ammonium, nitrate and nitrite</i>
CSN P CEN / TS 16188	<i>Sludge, treated bio-waste and soil - Determination of elements in aqua regia extracts and nitric acid - a flame atomic absorption spectrometry (FAAS)</i>
CSN P CEN / TS 16183	<i>Sludge, treated bio-waste and soil - Determination of selected phthalates using capillary gas chromatography with mass spectrometry (GC-MS)</i>
CSN P CEN / TS16178	<i>Sludge, treated bio-waste and soil - Determination of pharmaceutical</i>

	<i>products</i>
<i>CSN P CEN / TS16190</i>	<i>Sludge, treated bio-waste and soil - Determination of dioxins and furans, and dioxin-like polychlorinated biphenyls by gas chromatography with mass spectrometry with high resolution (HR GC-MS)</i>
<i>CSN P CEN / TS16181</i>	<i>Sludge, treated bio-waste and soil - Determination of polycyclic aromatic hydrocarbons (PAH) by, gas chromatography (GC) and high performance liquid chromatography (HPLC)</i>
<i>EN 16179</i>	<i>Sludge, treated bio-waste and soil - Guidance for sample treatment</i>
<i>EN 15933</i>	<i>Sludge, treated bio-waste and soil - Determination of pH</i>
<i>CSN 75 7951</i>	<i>Water quality. Chemical and physical analysis of sludge. Determination of extractable substances</i>
<i>CSN EN 12461</i>	<i>Biotechnology - Large scale and production - Guidance for handling, inactivating and testing of waste</i>
<i>EN 12740</i>	<i>Biotechnology - Laboratories for research, development and analysis - Guidance for waste disposal and testing</i>
<i>CSN 77 0000</i>	<i>Packaging - Basic terms</i>
<i>CSN 77 0020</i>	<i>Packaging. General requirements for packaging</i>
<i>EN 14182</i>	<i>Packaging - Terminology - Basic terms and definitions</i>
<i>DIN EN ISO 11683</i>	<i>Packaging - Tactile warnings - Requirements</i>
<i>ČSN 77 0052-2</i>	<i>Packaging - Packaging waste - Part 2: Identification marking of packaging for subsequent recovery of packaging waste</i>
<i>CSN 77 0053</i>	<i>Packaging - Packaging waste - Instructions and information on management of used packages</i>
<i>CSN 77 0054</i>	<i>Packaging - Requirements for returnable consumer packages</i>
<i>CSN EN 13193</i>	<i>Packaging - Packaging and the environment - Terminology</i>
<i>CSN EN 13427</i>	<i>Packaging - Requirements for the use of European standards for packaging and waste packaging</i>
<i>CSN CR 13686</i>	<i>Packaging - Optimization of energy recovery of packaging waste</i>
<i>ČSN CR 13695-1</i>	<i>Packaging - Requirements for measuring and verifying four heavy metals and other hazardous substances present in packaging and their release into the environment - Part 1: Requirements for measuring and verifying of four heavy metals present in packaging</i>
<i>CSN 77 0150-2</i>	<i>Packaging - Requirements for measuring and verifying four heavy metals and other hazardous substances present in packaging and their release into the environment - Part 2: Requirements for measuring and verifying dangerous substances in the packaging and their release to the environment</i>
<i>EN 13437</i>	<i>Recycling of packaging materials - Criteria for recycling methods - Description of recycling processes and material flow diagram</i>
<i>DIN EN 13431</i>	<i>Packaging - Requirements for packaging recoverable in the form of energy recovery, including specification of minimum inferior calorific value</i>
<i>EN 13432</i>	<i>Packaging - Requirements for packaging recoverable composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging</i>
<i>EN 14045</i>	<i>Packaging - Evaluation of the disintegration of packaging materials</i>

	<i>using practically oriented tests under defined conditions composting</i>
EN 14046	<i>Packaging - Evaluation of ultimate aerobic biodegradation of packaging materials under controlled composting conditions - Method of analytical determination of released carbon dioxide</i>
EN 14806	<i>Packaging - Preliminary evaluation of the disintegration of packaging materials under model conditions in a laboratory-scale composting</i>
DIN EN13429	<i>Packaging - Reuse</i>
EN13430	<i>Packaging - Requirements for packaging recoverable by material recycling</i>
EN 13439	<i>Packaging - Rate of energy recovery - The definition and calculation method</i>
EN 13440	<i>Packaging - Rate of recycling - Definition and method of calculation</i>
CSN CR 13504	<i>Packaging - Material recovery - Criteria for a minimum content of recycled material</i>
EN 10334	<i>Steel for packaging - Flat steel products for use in contact with food products and beverages for human and animal consumption - Steel uncoated (black plate)</i>
EN 10333	<i>Steel for packaging - Flat steel products for use in contact with food products and beverages for human and animal consumption - Tin coated steel (tin plate)</i>
EN 10335	<i>Steel for packaging - Flat steel products for use in contact with food products and beverages for human and animal consumption - Non alloy electroplated chrome (chromium coating / chrome oxide) steel</i>
EN 13028	<i>Packaging - Fine metal packaging - Round cans for carbonated simple or non-carbonated drinks for their nominal volumes filling</i>
CSN 49 0006	<i>Wooden containers. Terminology</i>
CSN EN 13593	<i>Packaging - Paper sacks for household waste collection - Types, requirements and test methods</i>
CSN EN 13592 + A1	<i>Plastic bags for domestic waste collection - Types, requirements and test methods</i>
CSN 83 8030	<i>Landfilling of waste - Basic conditions for designing and construction of landfills</i>
CSN 83 8032	<i>Landfilling of waste - Sealing of landfills</i>
CSN 83 8033	<i>Landfilling of waste - Handling of seepage waters from landfills</i>
CSN 83 8034	<i>Landfilling of waste - Degasification of landfills</i>
CSN 83 8035	<i>Landfilling of waste - Closure and reclamation</i>
CSN 83 8036	<i>Landfilling of waste - Monitoring of landfills</i>
CSN EN 13257	<i>Geotextiles and geotextile-related products - Characteristics required for use in solid waste disposal</i>
EN 13265	<i>Geotextiles and geotextile-related products - Characteristics required for use in liquid waste containment projects</i>
EN 13492	<i>Geosynthetic barriers - Characteristics required for use in the construction of liquid waste disposal sites, transfer stations or secondary containment</i>
CSN EN 13493	<i>Geosynthetic barriers - Characteristics required for use in the construction site for the storage and disposal of solid waste</i>

CSN EN 840-1	<i>Mobile waste containers - Part 1: Containers with 2 wheels with a capacity up to 400 l for comb lifting devices, dimensions and design</i>
CSN EN 840-2	<i>Mobile waste containers - Part 2: Containers with 4 wheels with a capacity up to 1 300 l with flat lid(s), for trunnion and/or comb lifting devices – Dimensions and design</i>
CSN EN 840-3	<i>Mobile waste containers - Part 3: Containers with 4 wheels with a capacity up to 1 300 l with dome lid(s), for trunnion and/or comb lifting devices – Dimensions and design</i>
STNEN 840-4	<i>Mobile waste containers - Part 4: Containers with 4 wheels with capacity up to 1 700 l with flat lid(s), for wide trunnion or BG and/or wide comb lifting devices - Dimensions and design</i>
CSN EN 840-5	<i>Mobile waste containers - Part 5: Requirements and test methods</i>
CSN EN 840-6 + A1	<i>Mobile waste containers - Part 6: Requirements for Safety and Health</i>
CSN EN 13071 -1	<i>Stationary waste containers to 5000 litres, top lifted and discharged through the bottom - Part 1: General requirements</i>
EN 13071-2	<i>Stationary waste containers to 5000 litres, top lifted and discharged through the bottom - Part 2: Additional requirements for systems fully or partially sunk into the ground</i>
EN 13071-2 + A1	<i>Stationary waste containers to 5000 litres, top lifted and discharged through the bottom - Part 2: Additional requirements for systems fully or partially sunk into the ground</i>
EN 13071-3	<i>Stationary containers Waste to 5000 litres, top lifted and bottom discharged - Part 3: Recommended lifting connections</i>
EN 14803	<i>Identification and/or determination of the quantity of waste</i>
EN 12574-1	<i>Stationary waste containers - Stationary waste containers - Part 1: Containers with a capacity up to 10 000 l with flat or dome lid(s), for trunnion, double trunnion or pocket lifting device - Dimensions and design</i>
CSN EN 12574-2	<i>Stationary waste containers - Part 2: Performance requirements and test methods</i>
DIN EN 12574-3	<i>Stationary waste containers - Part 3: Safety and health requirements</i>
EN 15132	<i>Shelters for mobile waste containers with a capacity up to 1700 l - Performance requirements and test methods</i>
EN 474-11 + A1	<i>Earth-moving machinery - Safety - Part 11: Requirements for compactors of soil and waste</i>
EN 16252	<i>Machines for compacting waste materials or recyclable parts - Horizontal baling presses - Safety requirements</i>
EN 1501-1	<i>Refuse collection vehicles – General requirements and safety requirements – Part 1: Rear loaded refuse collection vehicles</i>
CSN EN 1501-3	<i>Refuse collection vehicles and their associated lifting devices - General requirements and safety requirements - Part 3: Refuse collection vehicles with front tilting device</i>
EN 1501-4	<i>Refuse collection vehicles and their associated lifting devices - General requirements and safety requirements - Part 4: Method of testing refuse collection vehicle noise</i>
EN 1501-5	<i>Refuse collection vehicles - General requirements and safety</i>

	<i>requirements - Part 5: Tilting devices for refuse collection vehicle</i>
<i>CSN EN 1501-2 + A1</i>	<i>Refuse collection vehicles and their associated lifting devices - General requirements and safety requirements - Part 2: Waste collection vehicles with tipping device on the side</i>
<i>CSN EN ISO 14001</i>	<i>Environmental management systems - Requirements with guidance for use</i>
<i>ISO 14004</i>	<i>Environmental management systems - General guidelines on principles, systems and supporting techniques</i>
<i>CSN EN ISO 14031</i>	<i>Environmental management - Environmental performance evaluation - Guidelines</i>
<i>ISO / TR 14047</i>	<i>Environmental management - Life cycle assessment - Examples of application of ISO 14042,</i>
<i>ISO 14020</i>	<i>Environmental labels and declarations - General principles</i>
<i>CSN 01 0962</i>	<i>Environmental management - Integrating environmental aspects into product design and development</i>
<i>ISO 14015</i>	<i>Environmental management - Environmental assessment of sites and organizations (EASO)</i>
<i>ISO 14006</i>	<i>Environmental management systems - Guidelines for incorporating eco-design</i>
<i>CSN EN ISO 14040</i>	<i>Environmental management - Life cycle assessment - Principles and framework</i>
<i>ISO 14044</i>	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
<i>ISO 14050</i>	<i>Environmental management - Vocabulary</i>
<i>ISO14063</i>	<i>Environmental management - Environmental communication - Guidelines and examples</i>
<i>CSN P CEN / TS 15439</i>	<i>Biomass gasification - Tar and particles in gaseous products - Sampling and analysis</i>
<i>CSN 06 3090</i>	<i>Facilities for thermal removal / disposal and energy recovery of waste</i>
<i>CSN 07 7002</i>	<i>Disposal of solid residues from coal combustion</i>
<i>CSN 72 2071</i>	<i>Fly ash for construction purposes - Common provisions, requirements and test methods</i>
<i>CSN 72 2080</i>	<i>Fluid fly ash for construction purposes - Shared provisions, requirements and test methods</i>
<i>EN62430</i>	<i>Eco-design of electrical and electronic products</i>
<i>EN 50574</i>	<i>Collection, logistics &amp; treatment requirements for end-of-life household appliances containing volatile fluorocarbons</i>
<i>CSN EN 62321</i>	<i>Electrical products - Determination of levels of six substances with limited use (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers)</i>
<i>DIN EN 61429</i>	<i>Marking of battery cells and batteries with international label ISO 7000-1135</i>
<i>CSN EN 61960</i>	<i>Secondary cells and batteries containing alkaline or other non-acid electrolytes - Cordless lithium cells and batteries for portable use</i>
<i>EN 62554</i>	<i>Preparation of samples for measurement of mercury content in lamps</i>
<i>EN 50419</i>	<i>Marking of electrical and electronic equipment in accordance with</i>

	<i>Article 11 (2) of Directive 2002/96/EC (WEEE)</i>
<i>EN 62542</i>	<i>Environmental standardization of electrical and electronic products and systems - Glossary of Terms</i>
<i>CSN EN 61231</i>	<i>International labelling system of light sources (ILCOS)</i>
<i>EN 60480</i>	<i>Guidance on control and treatment of sulphur hexafluoride (SF6) obtained from electrical equipment and specification for its re-use</i>
<i>EN 15357</i>	<i>Solid recovered fuels - Terminology definition and description</i>
<i>EN 15359</i>	<i>Solid recovered fuels - Specifications and classes</i>
<i>EN 15442</i>	<i>Solid recovered fuels - Methods for sampling</i>
<i>DIN EN 15440</i>	<i>Solid recovered fuels - Methods for determination of biomass</i>
<i>CSN 83 8201</i>	<i>Solid recovered fuels - Report on relative difference between biodegradable and biogenic components of solid alternative fuels (TAP)</i>
<i>EN 15400</i>	<i>Solid recovered fuels - Determination of calorific value</i>
<i>EN 14588</i>	<i>Solid biofuels - Terminology, definitions and descriptions</i>
<i>EN 14961-1</i>	<i>Solid biofuels - Fuel specifications and classes - Part 1: General requirements</i>
<i>CSN EN 15234-1</i>	<i>Solid biofuels - Fuel quality assurance - Part 1: General requirements</i>
<i>EN 14778</i>	<i>Solid biofuels - Sampling</i>

## **5. EU laws and regulations**

*Directive 2008/98/EC of the European parliament and of the Council on waste and repealing certain Directives*

*Council Directive on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (86/278/EEC)*

*European parliament and Council Directive 94/62/EC on packaging and packaging waste*

*Council Directive 1999/31/EC on the landfill of waste*

*Directive 2000/53/EC of the European parliament and of the Council on end-of life vehicles*

*Directive 2012/19/EU of the European parliament and of the Council on waste electrical and electronic equipment (WEEE) (recast)*

*Directive 2011/65/EU of the European parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)*

*Regulation (EC) No 1013/2006 of the European parliament and of the Council on shipments of waste*



*Directive 2006/66/EC of the European parliament and of the Council on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC*

*Directive 2006/21/EC of the European parliament and of the Council on the management of waste from extractive industries and amending Directive 2004/35/EC*

*Council Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)*

*Regulation (EC) No 850/2004 of the European parliament and of the Council on persistent organic pollutants and amending Directive 79/117/EEC*

*Council Regulation (EU) No 333/2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council*

*Commission Regulation (EU) No 1179/2012 establishing criteria determining when glass cullet ceases to be waste under Directive 2008/98/EC of the European Parliament and of the Council*

*Commission Regulation (EU) No 715/2013 establishing criteria determining when copper scrap ceases to be waste under Directive 2008/98/EC of the European Parliament and of the Council*

*Commission Decision 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 of the Council (2011/753/EU)*

*Commission Decision replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (2000/532/EC)*

*Directive 2001/80/EC of the European parliament and of the Council on the limitation of emissions of certain pollutants into the air from large combustion plants*

*Directive 2010/75/EU of the European parliament and of the Council on industrial emissions (integrated pollution prevention and control) (Recast)*

*Regulation (EC) No 1907/2006 of the European parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC*

*Directive 2009/125/EC of the European parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products (recast)*

*Directive 2009/28/EC of the European parliament and of the Council on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC*

*Council Directive concerning urban wastewater treatment (91/271/EEC)*

*Regulation (EC) No 1069/2009 of the European parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation)*

*Directive 2005/64/EC of the European parliament and of the Council on the type-approval of motor vehicles with regard to their reusability, recyclability and recoverability and amending Council Directive 70/156/EEC*

*Council Directive on the prevention and reduction of environmental pollution by asbestos (87/217/EEC)*

*Directive 2011/92/EU of the European parliament and of the Council on the assessment of the effects of certain public and private projects on the environment (codification)*

*Council Directive 2011/70/EURATOM establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste*

*Regulation (EC) No 2150/2002 of the European parliament and of the Council on waste statistics*

## Annex no. 4

# List of abbreviations

BAT	Best Available Techniques
BREF	Reference Document on BAT
BDW	Biodegradable waste
BDMW	Biodegradable municipal waste
CENIA	Czech Environmental Information Agency
CEI	Czech Environmental Inspectorate
CTIA	Czech Trade Inspection Authority
WWTP	Wastewater treatment plant
CR	Czech Republic
CSO	Czech Statistical Office
EEC	European Economic Community
EIA	Environmental Impact Assessment
EC	European Commission
EMAS	Eco-Management and Audit Scheme
EMS	Environment Management System
EU	European Union
EC	European Communities
EFS	Environmentally friendly service
EFPP	Environmentally friendly product
EEPA	Environmental education and public awareness
GDP	Gross Domestic Products
HC	Hydrogen chloride
HF	Hydrogen fluoride
IBA MU	Institute of Biostatistics and Analyses
IPPC	Integrated Pollution Prevention and Control
IPR	Integrated Pollution Register
IS	Information system
WMIS	Waste Management Information System
NCIS	Nature Conservancy Information System
MW	Municipal waste
MBT	Mechanical biological treatment
MF (MoF)	Ministry of Finance
MIT (MoIT)	Ministry of Industry and Trade
MI (Moi)	Ministry of Interior
MA (MoA)	Ministry of Agriculture
ME (MoE)	Ministry of the Environment
MH (MoH)	Ministry of Health
HW	Hazardous Waste
WEEE	Waste Electrical and Electronic Equipment

NHW	Non-hazardous waste
OPE	Operational Programme Environment
MEC	Municipality with Extended Competency
PCB	Polychlorinated biphenyls
PCT	Polychlorinated terphenyls
WMP CR	Waste Management Plan CR
POPs	Persistent Organic Pollutants
PVC	Polyvinylchloride
SEA	Strategic Impact Assessment
SEF	State Environmental Fund
MMW	Mixed Municipal Waste
SDSF	Sustainable Development Strategic Framework
TACR	Technological Agency CR
RDF	Refuse Derived Fuel
CISTA	Central Institute for Supervising and Testing in Agriculture
RaD	Research and Development
WTEI	Waste to Energy Installation
SPA	Special Protection Area
WER	Waste Energy Recovery
MRW	Materially recoverable waste
TSL	Technical Securing of Landfill

## Annex no. 5

# References

[1] Masaryk University, Institute of biostatistics and analyses, Hřebíček J.; Kalina J.; Soukupová J.: Development of forecast of municipal waste production and of its management in the Czech Republic in the period 2014 – 2024, 2013.