

## Analysis of a Separate Biodegradable Waste Collection System and Best Practices in the Czech Republic<sup>3</sup>

### Abstract

*This article describes the Czech Republic's system of separate collection of biodegradable municipal waste. Given the limited scope of the article, we focus on bio-waste, according to Article 3(4) of Directive 2008/98/EC of the European Parliament and the Council of 19 November 2008 on waste and repealing certain Directives as they constitute the vast majority of biodegradable municipal waste, while the remaining portion of biodegradable municipal waste (particularly textiles made from natural fibres) is subject to an entirely different method of processing. In the first section, we analyse the legal framework for separate collection of biowaste in the Czech Republic and the establishment of the system. The next sections describe the relevant strategies and plans. We then focus on the treatment of separately collected bio-waste in the Czech Republic. We also examine the various measures aimed at motivating citizens (financial instruments, awareness-raising, information campaigns). Subsequently, we focus on the problematic aspects of the legal regulation. Analysing the literature dealing with this issue in the Czech Republic, we present the health risks and other problems that are frequently encountered in practice and the measures to mitigate or avoid them.*

**Keywords:** Waste, Czech Republic, Separate Collection, Biodegradable Municipal Waste, Waste Management Plans, Czech Waste Act, PAYT

1 | Ph.D., Masaryk University, Faculty of Law; ORCID: <https://orcid.org/0009-0002-2237-8736>; e-mail: [jakub.hanak@mail.muni.cz](mailto:jakub.hanak@mail.muni.cz)

2 | Mgr., Ministry of the Environment; e-mail: [78713@mail.muni.cz](mailto:78713@mail.muni.cz)

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## 1. Introduction

This article describes the Czech Republic's system of separate collection of biodegradable municipal waste. Due to the limited scope of the article, we focus on bio-waste according to Article 3(4) of the Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (hereinafter the 'Waste Framework Directive') as they constitute the vast majority of biodegradable municipal waste, while the remaining portion of biodegradable municipal waste (particularly textiles made from natural fibres) is subject to an entirely different processing method.

In the first few sections, we analyse the legal regulation of separate collection of biowaste in the Czech Republic and the operation of the system for separate collection of bio-waste. The next sections describe the relevant strategies and plans. Next, we analyse the treatment of separately collected bio-waste is ensured in the Czech Republic. We pay also study the various measures that motivate citizens (financial instruments, awareness-raising, information campaigns). Subsequently, we focus on the problematic aspects or gaps in the legal regulation. Based on our analysis of the literature dealing with this issue in the Czech Republic, we present the health risks and other problems that are most frequently encountered in practice and the various measures that are implemented to mitigate or avoid them.

## 2. A legal framework for the separate collection of bio-waste

### 2.1. International law

Currently, the Czech Republic is not a party to any binding international treaties that directly affect the system of separate biowaste collection.

The most important international treaty regulating waste management is the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted in 1989. This convention addresses biowaste only marginally, and only in cases where the biowaste possesses hazardous properties, applying exclusively to the transportation of such waste.

Several legally non-binding agreements address the domain of separate collection of biowaste or prevention of its generation, including recommendations from various international organisations.

For example, the United Nations Transforming our world: the 2030 Agenda for Sustainable Development, Resolution A/RES/70/1, in addition to requiring sustainable use of resources and prevention of waste leakage into the environment, sets Target 12.3, which aims to halve food waste by 2030.

In 2015, the United Nations Environment Programme (UNEP) issued the Global Waste Management Outlook, which highlights the benefits of separate biowaste collection and composting.

## **2.2. European law**

The regulation of a separate biodegradable waste collection system and subsequent handling of such waste in the Czech Republic, as in other European Union (EU) member states, is based on the obligations established by European legislation.<sup>4</sup>

### *2.2.1. Waste Framework Directive*

The term bio-waste is defined in Article 3(4) of the Waste Framework Directive as: “biodegradable garden and park waste, food and kitchen waste from households, offices, restaurants, wholesale, canteens, caterers and retail premises and comparable waste from food processing plants”.

A different term is used in the Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (hereinafter the ‘Landfill Directive’), which uses the term biodegradable waste, defined as: “any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard”.

This term is broader and includes all materials that are subject to biological decomposition. Thus, it encompasses all bio-waste, as defined in the Waste Framework Directive. As a result, the obligations relating to biodegradable waste under the Landfill Directive apply to all bio-waste.

The Waste Framework Directive defines the term separate collection of waste in Article 3(11) as: “the collection where a waste stream is kept separately by type and nature so as to facilitate a specific treatment”.

The key provision requiring the establishment of a separate collection system for bio-waste in the EU law is Article 22 of the Waste Framework Directive. According to this Article, member states shall ensure that by 31 December 2023, bio-waste is either recycled at the source (composted) or collected separately and is not mixed with other types of waste.

Theoretically, the obligation to collect bio-waste separately arose from the general provision in Article 10(1) and (2) of the Waste Framework Directive. According to this provision: “Member States shall take the necessary measures to ensure that waste undergoes preparing for re-use, recycling or other recovery operations and where necessary to facilitate or improve preparing for re-use, recycling and

4 | For an overview, see e.g. Thieffry 2021, 231–251.

other recovery operations, waste shall be subject to separate collection and shall not be mixed with other waste or other materials with different properties”.

Bio-waste collection is a separate system and is essential to enable subsequent recycling. Contamination with other waste renders the resulting compost or digestate unusable. Nevertheless, Article 22, with its specific deadline for the latest possible implementation of separate bio-waste collection, should be considered a special legal provision. Thus, Member States fulfilled their obligation by introducing a separate bio-waste collection system from 1 January 2024.

### *2.2.2. Landfill Directive*

For implementing a separate bio-waste collection system in the Czech Republic, a key obligation was the mandate to reduce the amount of biodegradable municipal waste in landfills, as set out in Article 5(1) and (2) of the Landfill Directive.

According to these provisions, member states were required to reduce the amount of biodegradable waste sent to landfill versus its total production in 1995. States that landfilled more than 80% of their municipal waste during 1995 were allowed to extend the deadlines for fulfilling this obligation.

Thus, for the Czech Republic, this provision implied the obligation to ensure that by 2010, only an amount of biodegradable municipal waste equivalent to 75% of the 1995 levels could be landfilled; however, this amount had to be reduced to 50% by 2013 and to 35% by 2020.

## **2.3. Development of legislation in the Czech Republic**

Since the 1990s, waste producers (legal entities and self-employed individuals whose activities generated waste, and municipalities in the case of waste handed over by private individuals) were required to classify waste according to its type and category, and to separately collect waste belonging to different types.<sup>5</sup> In the case of bio-waste, it includes waste types 20 01 08 biodegradable kitchen and canteen waste, 20 01 25 edible oil and fat, and 20 02 01 biodegradable waste.<sup>6</sup>

Typically, this obligation was fulfilled by producers when they produced bio-waste as part of their main activity (e.g., restaurants, park maintenance). Very

5 | This obligation originally arose from Section 5(1)(e) of Act No. 125/1997 Coll., on Waste, as in force on June 10, 1997, and was subsequently provided for in Section 16(1)(e) of Act No. 185/2001 Coll., on Waste, as in force on June 14, 2001. Currently, a similar obligation is imposed on everyone under Section 13(1)(c) of Act No. 541/2020 Coll., on Waste.

6 | According to Decree No. 8/2021 Coll. on the Catalogue of Waste and Assessment of Waste Properties (Waste Catalogue) that implements Commission Decision 2000/532/EC of 3 May 2000 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. Since 1 January 2025, Decree No. 8/2021 Coll. specifies a sub-type: 20 01 08 01 biodegradable kitchen and canteen waste of plant origin.

often, in the case of waste generated by ordinary individuals—whether employees of waste producers, customers, or residents of municipalities—this waste ended up (and still partially ends up) in mixed municipal waste or bulky municipal waste. It is quite common to burn garden waste at the place of origin.

A major amendment was observed in 2014 with Act No. 229/2014 Coll., which amended Act No. 185/2001 Coll., on Waste. This amendment introduced an obligation for municipalities to provide disposal sites for biodegradable waste. The implementing regulation, Decree No. 321/2014 Coll., on the scope and method of ensuring a separate collection of components of municipal waste, specified in Section 2(1) that it would be sufficient for municipalities to provide sites at least for plant-based bio-waste during the period from April 1 to October 31.

The Czech Republic introduced this obligation in 2014 because it failed to meet the target for reducing the amount of biodegradable waste landfilled in 2013, as mandated under Article 5(1) and (2) of the Landfill Directive.<sup>7</sup> The main reason for this failure was the large amount of biodegradable waste in mixed municipal waste, and the large quantity of mixed municipal waste being landfilled.

A further tightening of the obligation to provide sites for the separate collection of biodegradable waste arose in 2018, when the amendment Decree No. 210/2018 Coll. introduced a requirement to provide sites for the disposal of plant-based biodegradable waste throughout the year. In addition, it introduced an obligation to provide a site for separate collection of edible oils and fats.<sup>8</sup>

## **2.4. Current legal regulation of separate collection of bio-waste in the Czech Republic**

### *2.4.1. Obligation to implement a separate bio-waste collection method*

The obligation to ensure a separate bio-waste collection system has been established separately for municipalities, legal entities, and self-employed natural persons who are waste producers.

The basic obligation for municipalities to ensure sites for separate collection of bio-waste was incorporated into Act No. 541/2020 Coll., on waste (hereinafter the ‘Waste Act’) and its implementing decree from the previous legislation.

#### **2.4.1.1. Obligations of municipalities**

Section 59(2) of the Waste Act requires that municipalities designate sites for the separate collection of municipal waste, specifically hazardous waste,

7 | Ministry of the Environment 2014, 2.

8 | On the circular economy and the relationship between waste management and human rights, see also: Vomacka 2024, 283–306 and Kannowski-Ngaiza 2022, 55–93.

paper, plastics, glass, metals, bio-waste, edible oils and fats, and for textiles from 1 January 2025.<sup>9</sup> According to Section 34 of Decree No. 273/2021 Coll., on Details of Waste Management (hereinafter the 'Decree on Details of Waste Management'), it is sufficient if the municipality ensures sites at least for bio-waste of plant origin.

The Decree, alternatively, allows municipalities to fulfil the obligation to designate sites for bio-waste of plant origin by introducing a community composting system within their territory for depositing all plant residues produced within the municipality. However, this does not refer to community composting as the term is commonly understood. It refers to a specifically designed system for collecting plant residues, including kitchen plant waste, followed by transporting to one or more centralised composting facilities operated within the municipality. The requirements for such a system are defined in Sections 65 and 66 of the Waste Act.

#### 2.4.1.2. Obligations of legal entities and self-employed natural persons

Legal entities and self-employed natural persons who allow waste to be deposited at their business premises must, under Section 62(1) of the Waste Act, ensure sites for the separate collection of paper, plastics, glass, metals, and bio-waste. The Ministry of the Environment has issued a methodological guideline regarding Section 62(1).<sup>10</sup> Regarding bio-waste, the guideline distinguishes between two situations:

In cases where bio-waste is generated as part of the business operation (e.g., a restaurant or fast-food establishment), the operator must ensure separate collection of bio-waste, including the animal fraction (if food contains animal products).

Conversely, if waste bins are intended only for waste produced by employees or customers and not the operation itself, it is sufficient for the legal entity or self-employed person to ensure separate collection of bio-waste that is of plant origin.

#### 2.4.2. *Requirements for the method and scope of separate collection of bio-waste*

The Decree on Details of Waste Management defines the basic methods that municipalities can adopt to ensure separate bio-waste collection.

(1) Municipalities can designate separate collection of municipal waste components through:

- a) collection yards,
- b) waste management facilities,
- c) large-capacity containers,
- d) collection bins,

9 | See also Jakl et al. 2025 commentary on Section 59(2).

10 | Waste Management Department of the Ministry of the Environment 2021.

- e) a bagged collection system, or
- f) a combination of methods listed from a) to e).

When selecting any of these methods, the municipality must also meet the general requirements for waste collection containers under Section 5 of the Decree on Details of Waste Management.

Methodological guidelines from the Ministry of Environment<sup>11</sup> endorses an order to ensure the highest possible material purity, no waste should be placed in containers for separate collection of bio-waste in bags, including bags labelled as 'compostable' or 'biodegradable'. Interestingly, a study prepared for the Ministry of the Environment recommends using biodegradable bags for kitchen waste, particularly during the winter months, when the air may facilitate emptying collection containers.<sup>12</sup>

Czech legal regulations do not include any additional requirements on how the separate collection of bio-waste must be implemented. There are no binding rules regarding the number of collection sites relative to the number of inhabitants or walking distance. In principle, a municipality may formally fulfil its obligation by establishing a single site with sufficient capacity to accommodate the bio-waste generated across its territory. The Waste Act and its implementing regulations leave the choice of system design entirely to each municipality.

#### *2.4.3. A legal framework for establishing an effective system for separate collection of bio-waste*

As outlined above, the fact that municipalities implement an effective system for separate collection of recyclable waste, including bio-waste, is not directly guaranteed by the legal requirements governing the system design. The effectiveness of separate bio-waste collection is driven by other instruments and obligations, the most important being landfill fees and binding targets for the separate collection of recyclable municipal waste.

##### **2.4.3.1. Landfill fees and landfill ban**

Landfill fee is regulated under Section 103 and Annex No. 9 of the Waste Act. Increased fee applies to the landfilling of waste which recyclable or biodegradable or exceeds a calorific value of 6.5 MJ/kg of dry matter (this also includes mixed municipal waste and bulky waste). This fee is expected to increase until 2030.<sup>13</sup> In parallel, a ban on landfilling any recyclable waste, waste with a calorific value

<sup>11</sup> | Waste Management Department of the Ministry of the Environment 2022, 2.

<sup>12</sup> | Maxová 2023a, 81.

<sup>13</sup> | In 2025, the amount is CZK 1,500 per tonne, and it is expected to gradually increase to CZK 1,800 per tonne by 2029.

exceeding 6.5 MJ/kg of dry matter, or waste that does not meet the required level of biological stability is will also be forced.

Under Section 157 and Annex No. 12 of the Waste Act, municipalities are allowed to landfill a limited quantity of such waste per capita at a reduced fee.<sup>14</sup> However, this quantity is expected to gradually decrease by 2030, thereby motivating municipalities to reduce the total volume of residual mixed municipal waste.<sup>15</sup>

#### 2.4.3.2. Binding targets for separate collection of recyclable municipal waste

The second instrument designed to ensure that municipalities implement a separate collection system for bio-waste is the binding target for the separation of recyclable components of municipal waste, as specified in Section 59(3) of the Waste Act.

From 2025 onward, municipalities must ensure that the separately collected recyclable waste constitutes at least 60% of the total municipal waste generated within the municipality (from 2025), 65% from 2030, and 70% from 2035.

The explanatory memorandum to the draft Waste Act makes it clear that these targets are intended to strengthen the process of separate collection of bio-waste, including waste containing animal content.<sup>16</sup> Without implementing an effective system of separate bio-waste collection, municipalities will not be able to meet these targets.

#### 2.4.4. *Legal provisions affecting the implementation of separate collection of bio-waste*

##### 2.4.4.1. On-site composting

Article 22 of the Waste Framework Directive requires that Member States ensure the separate collection of bio-waste, or that such waste is recycled at the place of origin. In this context, recycling at the place of origin refers to composting. Articles 11a (4) and 11a (9) stipulate that bio-waste composted on-site may be counted towards meeting the recycling targets for municipal waste, as set out in Article 11(2)(c), (d), and (e) of the Directive. The specific method of target calculation is defined in Annex II of Commission Implementing Decision (EU) 2019/1004.

14 | The rate is CZK 500 per ton, and this rate will not change until the end of 2029.

15 | This year, the figure is 0.16 tonnes per inhabitant of the municipality; in 2026, it is projected at 0.15 tonnes, in 2027 0.14 tonnes, in 2028 0.13 tonnes, and in 2029 0.12 tonnes.

16 | Ministry of the Environment 2019, 157. "Without appropriate sorting of biowaste, it will not be possible to achieve the targets. The amount of sorted biowaste should increase, which is confirmed by the data from 2015–2017. With increasing targets, it will also be necessary to sort biowaste containing animal components, which is particularly suitable for processing in biogas plants. This should further contribute to meeting the targets in the field of renewable energy sources."



The Czech Waste Act does not consider composting of biological material at the place of origin as waste management. According to Section 12(3) of the Waste Act, it is considered waste prevention. Currently, the Czech Republic does not include bio-waste composted on-site in its national recycling targets, nor does it allow municipalities to include such composting in their targets for separate collection of recyclable municipal waste.

However, a change in this approach may occur in the upcoming years, as suggested in the explanatory memorandum to Section 59 of the Waste Act: “The Ministry will also consider whether to allow municipalities that support home composting to count such composted biological material towards their recycling targets. The rationale is to prevent municipalities from encouraging citizens to submit all biological material to the municipal separate collection system, as this would simplify the municipality’s compliance with recycling targets. Home composting, within the framework of waste prevention, is a more appropriate method of waste handling. Any such inclusion must be in accordance with the EU decision on recycling target calculations”.<sup>17</sup>

#### 2.4.4.2. Burning of plant waste at the site of origin

In the Czech Republic, the practice of burning plant waste from gardens, agriculture, and forestry at the site of origin persisted until March 1, 2025. This practice significantly impacted the amount of bio-waste that residents handed over to the municipal separate collection system. However, such handling of bio-waste did not comply with the requirements of Article 22 of the Waste Framework Directive.

Although this practice did not comply with the Waste Act, it was allowed under Section 16(4) and (5) of Act No. 201/2012 Coll., on Air Protection, which permitted it for dry plant material regardless of whether it conforms with the definition of waste.<sup>18</sup> The conflict between these legal provisions was resolved by a parliamentary amendment that clarified in Section 16(5) of the Air Protection Act that this provision does not apply to waste management.<sup>19</sup>

From 1 March 2025 onward, the general ban on waste management outside designated facilities, as stated in Section 13(1)(b) of the Waste Act, prohibits burning of plant waste in gardens. Exceptions to this ban include burning for the purpose of controlling harmful organisms under Section 38 of the Forest Act, or under extraordinary phytosanitary measures pursuant to Section 67 of the Act on Plant Health Protection.

The ban does not apply to purposeful burning of wood for activities such as cooking, provided such material does not meet the definition of waste.

<sup>17</sup> | Ibid., 182.

<sup>18</sup> | See also Bejčková 2018 commentary on Section 16(4)

<sup>19</sup> | Act No. 42/2025 Coll., amending Act No. 201/2012 Coll., on air protection, which came into force on 1 March 2025. See also the Ministry of the Environment 2025.

### 3. Separate collection of bio-waste in czech municipalities

As mentioned earlier, legislation does not set out detailed conditions for implementing separate collection of bio-waste. A municipality formally fulfils its obligation if it provides at least one collection site, for example, at a collection yard, with sufficient capacity.

Currently, comprehensive data are not available on how separate bio-waste collection systems are established across Czech municipalities.<sup>20</sup>

According to a study commissioned by the Czech Ministry of the Environment for establishing support under the subsidy programme, most municipalities provide separate collection only for plant-based bio-waste. Pilot projects are underway in a few cities to separately collect kitchen bio-waste containing animal-derived components.<sup>21</sup>

The collection systems are organised in two main ways:

- | Drop-off system – using larger containers placed at collection sites or yards.
- | Door-to-door collection – using smaller bins near households, regularly emptied by collection vehicles.

The methodological guideline of the Ministry of the Environment's Waste Department outlines the options for establishing separate bio-waste collection systems – both in terms of technical requirements and combinations of plant- and animal-based waste.<sup>22</sup>

This guideline specifies that even if a municipality collects only plant-based waste or fulfils its obligations through community composting, it must also collect plant-based kitchen waste, and not just garden waste.

If a municipality decides to collect animal-based waste as well, it can configure the system in several ways. The specific setup always depends on the final processing facility or facilities that are competent to manage the waste, especially the capacity to process waste containing animal components.<sup>23</sup>

Possible configurations include:

1. Combined collection of all plant and animal waste
2. Separate collection of plant and animal waste
3. Separate garden waste collection and combined collection of plant- and animal-based kitchen waste.

20 | In this regard, the situation should change next year, when municipalities will be obliged to submit reports on the municipal system according to the expanded sheet 5 of Annex No. 13 to Decree No. 273/2021 Coll., on the details of waste management. Sheet 5 also includes detailed information on the operation of a separate bio-waste collection system.

21 | Maxová et al. 2023a, 62.

22 | Waste Management Department of the Ministry of the Environment 2022, 1–2.

23 | See part 5.2 of this article.

In practice, a wide range of combinations of the above-mentioned methods of organising separate collection may occur – and indeed do occur. This includes variations in the types of waste that are collected separately, and the system or method of collection, that is, whether through a drop-off system or a door-to-door system.<sup>24</sup>

## 4. Strategies and plans

The system of separate collection of biowaste has been fundamental in waste management plans since the beginning. The development of waste management plans was preceded by provisional documents developed in the 1990s: the Waste Management Programme (1995) and the Waste Management Concept (1999). These strategies did not address the management of biodegradable waste.

It was not until the 2001 Waste Act that waste management plans were required at the national and regional level. The current Waste Act has replaced this system. Waste management planning is to be conducted in ten-year cycles. Each plan contains an analytical part (describing waste generation and waste management in the Czech Republic) and a binding part (setting waste management objectives and methods to achieve these objectives). However, there have always been delays in the preparation and adoption of plans for the following period. Therefore, we describe biodegradable waste management in the plan for the period from 2003 to 2014 (which was extended by one year), the plan is still operational for the period from 2015 to 2024 (which will also be extended by at least a few months), and the draft of the new plan for the period from 2025 to 2035.

As regional waste management plans are based on the national plan and must not contradict it, they are not discussed further in this article. From 2021 onward, municipalities were no longer obliged to prepare waste management plans. Nevertheless, large cities adopted their own strategies with a broader focus: for instance, Prague Climate Plan 2030 recognises that bio-waste, which constitutes about 40% of household waste, is still only minimally utilised, although Prague has facilitated the collection of plant-based bio-waste and is expanding the capacity of its composting facilities.

The first Waste management plan was prepared on schedule and approved in 2003. Its binding part was issued as Government Decree No. 197/2003 Coll. The analytical part, including an assessment of the state of waste management, was published in the Bulletin of the Ministry of the Environment in October 2003. Although the binding part was amended in 2009, the changes were minor and did not affect bio-waste management even indirectly. On page 12, the plan briefly states that the introduction of a system of separation and subsequent recovery of biodegradable

24 | The issue of the optimal configuration of this combination is examined in detail in the second phase of the aforementioned study commissioned by the Ministry of the Environment. Maxová et al. 2023b.

waste is one way of reducing the waste going to landfill, as required by the Landfill Directive. On page 29, the plan indicates that only a few highly developed countries and regions had introduced separate collection systems for biodegradable waste. However, the plan rightly considered that one of the main problems of waste management in the Czech Republic was insufficient collection of separated waste in the commercial and civil sectors (in the case of municipal waste, it specifically mentioned bio-waste along with hazardous waste and plastic waste). The objectives were also consistent with this analysis. The main goal was to create conditions for separate collection of different types of biodegradable waste from households, businesses, industry, and public authorities. In addition, the Czech Republic's Biodegradable Waste Implementation Programme is yet to be developed to comprehensively address the management of biodegradable waste, with a particular focus on reducing the amount of biodegradable waste going to landfills. During the plan period, separate collection of bio-waste in municipalities was voluntary for residents. On the other hand, businesses and legal entities were obliged to collect it separately. The mid-term evaluation confirmed that the most challenging area of municipal waste management would be the development of technologies for separate collection of recyclable components, including bio-waste.

The next waste management plan was estimated to cover the period from 2015 to 2024; however, it is still in force. This plan was adopted prior to mandating separate collection of bio-waste in municipalities. Accordingly, the plan includes the requirement to implement a mandatory system for the separate collection and management of biodegradable waste, at least for plant-based waste in municipalities. This objective was to be achieved through the development of a collection system for bio-waste, with continuous monitoring of separate collection practices. The plan also outlined a strategy of progressively increasing landfill fees for municipal waste so that the amount makes the landfill of recyclable and recoverable waste streams (including those with a biodegradable component) disadvantageous. While the plan originally aimed to ban the landfilling of mixed municipal, recyclable, and recoverable waste by 2024, this was later deferred to 2030 under the Waste Act.

The draft of the new Waste Management Plan (2025–2035) was adopted this year (2025) with the target to increase the separation of bio-waste, including kitchen waste (this measure was mentioned in the previous waste management plan and in its revision in 2022). Therefore, an economically sustainable, accessible, and convenient separate collection of kitchen bio-waste will be introduced for all residents across all municipalities (Measure 3.5.2). An effective system will be achieved by further expanding and improving existing instruments: mainstreaming charging based on the PAYT principle, intensive education and awareness-raising to promote separate collection of bio-waste, rigorous monitoring of the presence of recyclable components in citizens' mixed municipal waste, and support for infrastructure development, including the provision of sufficient bio-waste collection containers and appropriate collection equipment. Therefore, the highest investment in waste

management between 2025 and 2035 (up to 90%) in the development of the collection network for separately collected recyclable waste is expected to derive from the operation of intensive door-to-door systems for paper, plastics, and bio-waste.

It should be noted that waste management plans develop more general strategies. The Biomass Action Plan foresees that 44% energy will be produced from by-products and biodegradable waste. Nevertheless, it does not specify the specific share (importance) of bio-waste. The substitution of purpose-grown biomass in energy production by the biodegradable fraction of municipal waste is also called for in the State Environmental Policy adopted in January 2021. This key strategic document for environmental protection contains several specific targets that promote separate collection of biodegradable waste: target 2.1.3 (increased use of renewable energy sources), target 2.2.2 (maximum waste prevention), and target 2.2.3 (compliance with the waste management hierarchy). It also identifies the existing limitation of insufficient separation of bio-waste, identifying inconsistent sorting as the main reason for bio-waste being disposed of in landfills or incinerators. The Czech Republic's Regional Development Strategy for 2019 has concluded that, particularly in rural areas, there is a lack of sufficient technical infrastructure to meet waste management targets and to enable municipalities to process the separately collected bio-waste.

National circular economy strategic framework (Circular Czechia 2040) mentions that consumers can contribute to the sustainability of the bioeconomy by separating bio-waste from other waste streams.<sup>25</sup> One of the measures of this strategy (No. 14) in waste management (area No. 5) aims to strengthen and expand the collection of biological waste (both plant and animal origin) across the Czech Republic. The introduction of intelligent waste management systems in municipalities (e.g. PAYT incentive principle, door-to-door system) is recommended in the Strategic Framework Czech Republic 2030 (Measure 19.7.i).

## **5. Legal framework for proper treatment of separately collected bio-waste**

If separate collection of bio-waste is successfully implemented, it is also necessary to ensure appropriate subsequent treatment.

### **5.1. European law**

The most appropriate method of handling separately collected bio-waste is derived from the fundamental requirement of the waste hierarchy, as defined in Article 4 of the Waste Framework Directive. The obligation to prioritise recycling

25 | Circular Czechia 2040, 65.

of bio-waste is attributable to the general duty endorsed in Article 10(1) of the same directive.

In the case of separate collection of municipal waste, two key provisions are particularly relevant. First, Article 10(4) of the Waste Framework Directive states that: “Member States shall take measures to ensure that municipal waste and municipal bio-waste that has been separately collected for preparing for re-use and recycling is not incinerated, with the exception of waste resulting from subsequent treatment operations of the separately collected waste for which incineration delivers the best environmental outcome in accordance with the waste hierarchy”.

The second provision is Article 5(3)(f) of the Landfill Directive, which imposes a similar restriction for the landfilling of separately collected municipal waste.

Article 22(2) of the Waste Framework Directive explicitly imposes obligations on Member States, specifically regarding bio-waste:

Member States shall take measures in accordance with Articles 4 and 13, to:

- a) encourage recycling, including composting and digestion of bio-waste in a way that fulfils a high level of environment protection and results in output which meets relevant high-quality standards;
- b) encourage home composting; and
- c) promote the use of materials produced from bio-waste

The directive regards home composting, industrial composting, and anaerobic digestion as equivalent methods under the waste hierarchy. If the condition under Article 11a (4) is met, both composting and anaerobic digestion qualify as recycling. Thus, the choice of a specific processing method is left to the discretion of each Member State.

## **5.2. Legal framework in the Czech Republic**

Section 35(3) and Section 36(5) of the Czech Waste Act are the fundamental legal provisions ensuring that separately collected bio-waste is genuinely recycled. These sections implement Article 10(4) of the Waste Framework Directive and Article 5(3) of the Landfill Directive, respectively. According to these provisions, separately collected recyclable waste that can be processed at a higher level of the waste hierarchy may neither be landfilled nor used for energy recovery.

An exception is for the output from mechanical sorting, for which energy recovery or disposal is the only possible management method that is consistent with the waste hierarchy framework. The Decree on the Details of Waste Management states in Table 7.1 of Annex 7 that the maximum share of such output from sorting

of separately collected bio-waste that may be subject to energy recovery is 10%.<sup>26</sup> In the case of landfilling, Table 7.2 of the same annex allows for up to 10% of separately collected municipal bio-waste to be landfilled, decreasing to 5% by 2030.

Thus, up to 20% of waste may currently be subject to energy recovery or disposal after pre-treatment, prior to composting or anaerobic digestion. Disposal typically concerns heavily contaminated material, while energy recovery is used for large wood fractions.

The remaining share of separately collected bio-waste should be processed via recycling, either composting or anaerobic digestion with subsequent utilisation of the resulting digestate.

Sections 69 and 64 of the Waste Act and Sections 44–53 and Annexes 25–30 of the Waste Management Decree regulate the conditions for processing bio-waste in composting facilities and anaerobic digestion plants. These provisions define detailed requirements for facility equipment and for compost and digestate quality, ensuring high output quality and subsequent usability. According to Article 6(4) of the Waste Framework Directive, compost and digestate that meet these criteria are no longer considered waste.

In Section 54, the Decree specifies that the same conditions apply to community composting facilities as to conventional composting plants.

If separately collected bio-waste contains an animal component, it is considered an animal by-product according to Regulation (EC) No 1069/2009 of the European Parliament and the Council of 21 October 2009 establishing health rules for animal by-products and derived products not intended for human consumption, repealing Regulation (EC) No 1774/2002. Any facility that manages such waste must, in addition to a permit under the Waste Act, also have a permit under Act No. 166/1999 Coll., on veterinary care, and fulfil all obligations for animal by-products.

From the perspective of the waste management hierarchy, composting and treatment in a biogas plant are on the same level. The choice of a specific treatment method is, therefore, determined by practical considerations, such as the availability of appropriate facilities. It can also be stated that each treatment method is more suitable for a specific composition of bio-waste. The study prepared for the Ministry of the Environment defines the following types of separately collected bio-waste and assigns appropriate treatment methods to them.<sup>27</sup>

- | Garden plant bio-waste – composting.
- | Household bio-waste containing both plant- and animal-based materials, excluding plant residues from gardens – anaerobic digestion in a biogas plant equipped with a sanitation unit for animal by-products.

26 | As stated above, the use in biogas plants is not considered energy recovery, but as recycling, provided that the resulting digestate is used materially as a fertiliser.

27 | Maxová et al. 2023a, 95.

- | Plant-based bio-waste containing the plant-based fraction of both 'household bio-waste' and 'garden bio-waste' – composting.
- | Animal-based bio-waste – anaerobic digestion in a biogas plant with a sanitation unit for animal by-products.
- | All bio-waste – both 'household bio-waste' and 'garden bio-waste'. The appropriate treatment technology is an enclosed composting facility with controlled air circulation and temperature regulation, maintaining temperatures above 70 °C. However, due to the legislative requirement to shred all the material containing animal by-products, this treatment method is currently economically impracticable.

## 6. Measures to encourage citizens to separate biodegradable municipal waste

The Czech Republic does not have a uniform, nationwide strategy to motivate residents in municipalities to sort their biodegradable waste. Instead, each municipality uses its own combination of instruments. They can create a system that works best for their own situation, considering people's behaviour, nature of the settlement area, and dedicated facilities where the waste can be processed.

International organisations recommend the broad application of a fee based on the amount of waste generated (PAYT schemes).<sup>28</sup> When a municipality uses this system, residents are motivated to sort their waste because they do not pay for the collection of sorted waste components. In fact, the charge is only for collecting mixed municipal waste, which should not contain other recyclable components. Previously, some authors have warned that this type of fee charging would encourage citizens to engage in illegal waste management: incineration or black dumping.<sup>29</sup> However, these fears did not materialise, and these reservations are currently unknown. The PAYT schemes used in the Czech municipalities probably motivate people to increase waste separation and not dispose of the waste in questionable ways.<sup>30</sup> The Czech Act No. 565/1990 Coll., on Local Fees allows for the collection of payments from residents based on the weight (in kilograms) or volume (in litres) of mixed municipal waste generated. Technically it is quite difficult to weigh and measure the waste generated (although this is being done in many municipalities), and it is more common to pay according to the capacity of the containers ordered and collected.<sup>31</sup>

28 | OECD Environment Policy Paper no. 27: Towards a National Strategic Framework for the Circular Economy in the Czech Republic 2021, 58.

29 | Slavík et al. 2015, 60.

30 | Struk 2017, 161.

31 | For more information, see e.g. Těžký, Hasil Edelmanová & Jantoš, 116–167.



Unfortunately, there are no data on the number of municipalities that apply the PAYT fee described above. However, as they are certainly still a minority: it is estimated that the PAYT system covers about 20 % of the population,<sup>32</sup> and 10–15 % of municipalities. Of the regional cities with a total population of around 2 million, only the metropolitan city of Prague uses this fee (in fact, it has always used this system and is the largest city in the Czech Republic; therefore, the size of the municipality per se is not a reason for not using the PAYT system. Most residents, therefore, pay a fee per the rate structure fixed by the municipality where they are registered as residents. The fee amount does not depend on the amount of waste generated by the resident (taxpayer). It is, therefore, a per capita payment that does not directly motivate anyone to sort waste. Although the sorting rate impacts a municipality's waste management costs that the fee is expected to cover, this indirect outcome is not considered as a motivating factor.

However, even in a flat-rate system, the municipality can give an advantage to citizens who sort biodegradable waste or compost plant-based bio-waste. For such citizens, it is possible to reduce the fee: for example, based on the amount of recyclable waste sorted. However, these discounts are more often applied to plastic, paper, or glass waste.

The most common form of economic support for residents is the provision of composters on favourable long-term conditions. Various subsidy programmes have supported the purchase of composters by municipalities or NGOs, most often the Operational Programme for the Environment. Municipalities usually lend composters to residents free of charge, on the agreement that they will become owners of these bins after five years or more.

In fact, municipalities themselves are increasingly financially motivated to collect biodegradable waste separately. In the past, this was based on financial support to improve the collection system (purchase of containers, collection equipment, pilot projects) and the processing capacity for sorted biodegradable waste (establishment of composting or biogas plants). This strategy will continue, because The National Recovery Plan supports establishing infrastructure for separate collection of bio-waste (Component 2.7.1.1). Later, negative incentives were introduced. Since 2021, the landfilling fee for recyclable waste, which includes biodegradable waste, has been increased annually. Therefore, it is more profitable for municipalities and residents to sort as much waste as possible and landfill only non-recyclable mixed municipal waste. The importance of an increased landfilling fee is considered essential in the Czech Republic for over a long time.<sup>33</sup>

Consistent with the Czech theory, we do not consider penalties for illegal behaviour as an economic instrument, even though they have negative financial

32 | Early warning assessment related to the 2025 targets for municipal waste and packaging waste 2022,27.

33 | Závodská, et al. 2014, 143.

consequences for municipalities.<sup>34</sup> As shown below, the last time a municipality was fined for a non-functioning separate collection system was in 2019.

Sufficient information and continuous education of citizens is a necessary condition for a well-functioning separate bio-waste collection system. This fact was already recognised and confirmed in the first pilot projects at the beginning of the 21st century (e.g. excursions to waste management facilities in Vysoké Mýto in 2006, where separated waste is managed proved successful).<sup>35</sup> However, some studies, such as Slavík & Rybová & Dolejš, have shown that the additional information campaign could not replace the absence of social norms in the long-term.<sup>36</sup>

Communication with citizens should be thorough, non-violent, and concrete. In small municipalities, the behaviour of mayors, who are important opinion leaders, is crucial.<sup>37</sup> Residents must be informed in advance about the introduction of bio-waste separation.<sup>38</sup> Communication must be intensive at the time of introducing the new sorting system. However, communication with residents must be ongoing,<sup>39</sup> and all available communication channels must be used. Research conducted in more than 500 municipalities in Southern Moravia indicates that people are more likely to collect bio-waste separately if they are involved in the process of designing the system in their village or city.<sup>40</sup> A good example are the results of the bachelor's thesis,<sup>41</sup> wherein the author conducted a repeated questionnaire survey in the municipality of Rašovice. In this municipality, besides the traditional methods of communication (discussion with citizens, municipal newsletter, leaflets), the video of a popular youtuber (influencer) was most effective.<sup>42</sup> These conclusions from Czech municipalities corresponds with the aspects highlighted in European guidelines.<sup>43</sup>

At a time when municipalities had to introduce a separate collection system for bio-waste, it was criticised that there was no unified communication strategy for the management of organic materials in the Czech Republic.<sup>44</sup> This led to different results in different municipalities. Unfortunately, the situation has not changed much since then. Municipalities share their experiences, but each municipality can inform its residents in different ways. Even the labelling of collection bins is not standardised, although brown bins are commonly used for bio-waste. Therefore, the proposal of Waste Management Plan 2025–2035 is

34 | Jančářová et al. 2016, 585.

35 | Tupec 2006, 17.

36 | Slavík, Rybová & Dolejš 2019, 44.

37 | Pich 2020, 14.

38 | Tvrđíková 2021, 30.

39 | Šestáková 2023, 11.

40 | Struk, Hřebíček & Horsák 2016, 9.

41 | Novák 2024, 15.

42 | Ibid.

43 | E.g. Brambilla, et al. 2024, 32.

44 | Hodek 2014, 17.

to impose a duty to create a unified Communication Strategy in municipalities. However, targeting information campaigns is not an easy task when residents who do not recycle represent a heterogeneous segment of the population and, moreover, people who are willing to recycle require different information than people who do not recycle.

For all municipalities, the only obligation is to inform residents, at least once a year, about the methods and extent of separate collection of municipal waste, recovery and disposal of municipal waste, and the options available to prevent and minimise the generation of municipal waste. Municipalities must also publish annually the results of municipal waste management, including the costs of operating the municipal system [see Section 60(4) of the Waste Act]. Aiming to ensure that all municipalities comply with this obligation in a similar manner, the Ministry of the Environment issued a detailed methodology in 2023.

Awareness-raising activities by NGOs are important and are supported by public funds (mostly by the State Environmental Fund). For example, the #Live-Komposty campaign was launched in 2019 to promote waste sorting (e. g. through videos made by Czech celebrities). The authorised company EKO-KOM, which provides packaging take-back for retailers, has been supporting municipalities for over long time: in addition to promoting waste sorting through commercials and special websites, it creates a large number of information materials for municipalities (in Czech and foreign languages).

## 7. Problematic aspects of the legal framework

### 7.1. Absence of mandatory separate collection of animal-based bio-waste

The definition of bio-waste in the Waste Framework Directive includes bio-waste of animal origin. It is thus unclear if by allowing municipalities to organise separate collection only for plant-based bio-waste, the Czech Republic fully complies with the obligation defined in Article 22 of the directive.

In autumn 2024, the Ministry of the Environment attempted to introduce a change. A proposed amendment to the Waste Management Decree included a change to Section 34, which would require municipalities to separately collect animal-based bio-waste starting January 1, 2026.<sup>45</sup> However, this requirement was removed from the final version of Decree No. 18/2025 Coll., published in the Collection of Laws. The main reasons were objections from municipal associations citing the short implementation timeline and lack of sufficient biogas plants capable of processing such waste.<sup>46</sup>

45 | Ministry of the Environment 2024a, 1.

46 | Svaz měst a obcí České republiky 2024, 3–4.

In its response to the objections, the Ministry stated it would present a compromise amendment in early 2025, postponing the obligation to January 1, 2028, and with an exemption for municipalities with fewer than 2,000 residents.<sup>47</sup>

As of this article's date of completion, no new proposal has been submitted by the Ministry of the Environment.

## **7.2. Lack of binding requirements for collection network coverage**

As previously mentioned, municipalities can fulfil their obligation to ensure places for separate collection of bio-waste by providing just one collection site. Even though this rarely happens in practice, the actual density of the collection network often does not allow for convenient waste separation by residents. While other instruments support denser collection systems, a specific binding requirement (e.g. a walking-distance criterion) could significantly improve public access to bio-waste collection sites. As mentioned above, the Czech Republic relies primarily on binding targets for the separate collection of biowaste. Considering the large amount of bio-waste of plant origin, this will certainly lead to a more consistent waste collection system. These targets may not be effective for introducing a consistent system for collecting bio-waste of animal origin, unless they are adjusted and the defined targets are set individually for each type of waste.

## **7.3. A limited possibility of control over compliance with obligations**

The Waste Act allows for imposing penalties for incorrect sorting of recyclable waste. However, it is not possible to control whether recyclable waste is correctly sorted and whether it is not disposed of as mixed municipal waste. Owing to the nature of mixed waste, it is difficult to prove if the waste was contaminated before being placed in a mixed municipal waste container. Furthermore, in apartment buildings, where mixed waste containers are shared, it is almost impossible to identify the person responsible for incorrect sorting.

# **8. Best practices in managing health and other risks**

Health risks have been rarely mentioned in the literature. The odour of waste in bins and containers has been discussed more frequently, nevertheless it represents the minority of mentioned problems. The biggest issue is the low quality of the separated biodegradable waste, as this does not allow to use waste as a resource in composting plants.

<sup>47</sup> | Ministry of the Environment 2024b, 31.

Recommendations and practical experience confirm that the separate collection of biodegradable waste is affected by its instability and degradability, which is mainly influenced by its composition (the animal component is more problematic) and the temperature of the environment where the collection containers are placed. However, this aspect is rarely discussed in detail. An exception is an article written in 2009 by staff of the National Institute of Public Health, wherein authors describe the reasons for the increased concentration of microorganisms and fungi in biodegradable waste. They also showed that workers who handle the bins (especially waste collectors) are at a higher risk. These risks can best be countered by regular washing and disinfection of the containers.<sup>48</sup> Another common recommendation is to use special containers that allow for ventilation, which reduces the moisture content of the waste and reduces odours and the growth of microorganisms.<sup>49</sup> A necessary organisational measure is to increase the frequency of container transport (especially during the warm season) which, however, could increase the price of collection by tens of per cent.<sup>50</sup> Municipalities, therefore, usually collect bio-waste containers at longer (usually double) intervals in winter. As the decomposition of waste is affected by temperature, it is recommended that kitchen waste be stored in cool rooms or refrigerators<sup>51</sup> and collection bins be placed in areas that are shaded throughout the day (out of direct sunlight).<sup>52</sup>

Residents often cite odour as the reason for not sorting biodegradable waste.<sup>53</sup> Professional studies also suggest that odour and insects, and the reluctance to take waste out of the home daily to outdoor bins, are barriers to better sorting.<sup>54</sup> However, these concerns are not shared by the professional community and do not arise in practice. Otherwise, it is difficult to explain why this aspect is mentioned occasionally.<sup>55</sup>

This becomes even more clear when we consider that difficulties in collecting bio-waste containers during the winter were mentioned much more frequently. In fact, when the outside temperature is very low and the humidity of the bio-waste in the container is high, it may not be possible to empty all the waste because it will freeze in the container,<sup>56</sup> and the containers are also more likely to be damaged.<sup>57</sup> However, these findings have been challenged by the contrary experience.<sup>58</sup>

48 | Zimová & Matějů 2009, 17.

49 | Zemánek, et al. 2010, 35.

50 | Hejč, Hřebíček & Pilar 2005, 13.

51 | Königová 2017, 27.

52 | Vološinová & Kořínek 2023, 18.

53 | Editorial Staff 2023, 11. Identically Makevision. 2018.

54 | Vološinová, Kořínek & Čejka, 2019, 32. Zemánek et al. 2010, 36.

55 | Lochovská 2023, 14.

56 | Hudec 2024.

57 | Chalupová 2019.

58 | Baráková & Hlavenka 2018, 21.

By far the most frequent problem, mentioned in most existing literature in both a positive and a negative sense, is the quality of sorted waste. This is the result of both in-depth pilot projects in towns with more than 10,000 inhabitants (e.g. Bílina in 2005<sup>59</sup> or Kroměříž in 2009<sup>60</sup>) and large regional towns with around 100,000 inhabitants (Pardubice in 2023<sup>61</sup> or Ústí nad Labem, where separate collection of bio-waste had to be stopped in 2021 for this reason<sup>62</sup>), as well as the daily observations of those responsible. An exception is the experience of some towns in the Zlín region, where no major problems have been reported about the cleanliness of the collected material.<sup>63</sup> According to the literature analysed, the problem affects apartment blocks, where there is greater anonymity and conditions for sorting the waste are more difficult than in single-family houses with gardens. Therefore, the literature discusses various measures to improve the quality of sorting in housing estates. The focus is on awareness raising and clear labelling of bins. Other types of measures include restricting access to bins (including locking them),<sup>64</sup> using a door-to-door system with transparent bags,<sup>65</sup> or checking bins before collection (non-compliant bins are not emptied and are marked).<sup>66</sup>

All these problems should be resolved by educating citizens and through effective enforcement of the obligations placed on them. We analysed the importance and form of awareness-raising measures elsewhere, and describe the reasons for the low enforcement rate. Systemic failure, or the lack of control activities by competent authorities is indicated as the main reason by the composting plant operators, as their whose operations are hampered by the poor quality of the sorted bio-waste.<sup>67</sup> However, the low number of inspections by the Czech Environmental Inspectorate is also criticised by waste producers in publications describing waste management.<sup>68</sup> Municipalities are responsible for ensuring that residents comply with their obligations. Activities of municipalities have not yet been systematically examined. However, we believe that Czech municipalities do not penalise their residents for illegal waste sorting, even though they have the power to do so.<sup>69</sup> In fact, there is no mention of punishing illegal behaviour in any of the pilot projects or

59 | Hora, Soukalová & Iljučoková 2005, 16.

60 | Stejskal 2010, 211.

61 | Míča 2022, 7.

62 | Ústí nad Labem 2021.

63 | Marková 2010, 16.

64 | Tomášková 2024a, 17.

65 | Tomášková 2024b, 35.

66 | Gregor 2022, 4.

67 | Žilík 2023, 5.

68 | Königová 2017, 51.

69 | Residents are required to dispose of biodegradable waste at locations designated by the municipality: most often by a binding municipal ordinance (Section 61 of the Waste Act). The municipal authority is then entitled, pursuant to Section 147 of the Waste Act, to check if residents are complying with this obligation. Failure to comply is an offense under Section 117(1)(t) of the Waste Act, and a fine of up to CZK 50,000 may be imposed.

in the experiences shared by individual municipal managers. Instead, the importance of continuous public education and information is always emphasised.

We, therefore, shifted our attention towards the Czech Environmental Inspectorate's monitoring of municipalities. In its annual reports, the Inspectorate explicitly mentions the results of the inspections focused on the compliance of the municipality with the obligation to ensure separate collection of biodegradable waste since 2016 (i.e. one year after the obligation was introduced). The results must be evaluated based on the knowledge that the number of inspections is relatively low: between 2016 and 2023 only about one tenth of the country's municipalities were inspected (namely 706 out of more than 6,200, some of them apparently repeatedly). Only in five cases, municipalities seemed to have breached their obligation to collect biodegradable waste separately. The last instance of this lapse was in 2019. Therefore, it can be assumed that currently most municipalities in the Czech Republic have a functionally adequate municipal waste management system. Only isolated partial irregularities were found: burning of branches, grass, and waste from cemetery greenery (2020, 2021 and 2022), which was not implemented per the law.

## 9. Science and literature

There are two journals in the Czech Republic that publish articles on different waste management topics. Both magazines have been published monthly (with a double issue in summer) for more than twenty years. However, they are not scientific journals. The target audience is municipal and corporate waste management personnel, as reflected in the nature and scope of the articles. These are one- or two-page articles (longer texts are exceptional) of a popular, informative, and educational nature. Some of the articles are promotional: for example, the advantages of kitchen waste collection by a private company were described thrice during the past five years (2020, 2022, 2025), including an interview with the company's director. Conversely, several articles report on the results of expert studies or qualification papers, thus increasing their reach.

We analysed journal volumes published between January 2005 and March 2025. We considered articles on with the specifics of biodegradable waste collection as relevant. However, only 2–3 such articles were published per year. Therefore, we also included articles dealing with the sorting of all types of waste and the actual processing of bio-waste (composting, biogas plants) in a more detailed analysis. Each issue of the journal comprises an average of 18 to 20 different articles, so the proportion of texts dealing with biodegradable waste management is around 5%. Considering the importance of this topic and the share of this waste in total production, this is a slight underestimation of the attention given to it. It should be noted that publication activities are not evenly distributed throughout the

year. In fact, both journals publish special thematic issues dedicated to bio-waste management.

There are several popularisation articles, some of which are financially supported by the Ministry of the Environment: for example, an eleven-part series of articles entitled 'Municipalities and bio-waste', which has been supplemented by podcasts. Several NGOs also support the proper management of bio-waste through their awareness-raising activities: the Czech Biomass Association (Biom) is dedicated to the treatment of bio-waste; the Kokoza Association promotes composting by urban residents.

On the other hand, the number of expert articles analysing the relevant legislation is limited.<sup>70</sup> Studies dealing with the effectiveness of different methods of separate waste collection and the suitability of different measures applied in practice are more frequent (e. g. evaluate the consequences of increasing and decreasing walking distance to bio-waste bins in the pilot project in Ústí and Labem).<sup>71</sup>

## 10. Conclusions

The Czech Republic's legislation on the management of biodegradable waste implements European directives, particularly the Waste Framework Directive and the Landfill Directive. The legislation is also the result of over twenty years of development, during which time the obligation to collect biodegradable waste separately has gradually been extended (in terms of scope, types of waste, and months of the year when it must be conducted). The relevant authorities have always recognised the importance of this issue for Czech waste management, devoting considerable attention to it in strategic documents. In the Czech Republic, municipalities are exclusively responsible for ensuring that biodegradable waste is sorted to the required extent. Conversely, the state provides municipalities with substantial financial and methodological support for creating the necessary infrastructure (collection yards, composting plants, bins), and awareness-raising campaigns. An analysis showed that effective communication with municipal residents and other entities that generate biodegradable waste is crucial for achieving the set targets. Although economic instruments (municipal waste management fees) are used across all municipalities, the impact is low due to the relatively low level and, above all, the lack of individualisation (only a minority of municipalities use PAYT schemes). We see the greatest scope for improvement in this area; however, this does not require any changes to the legislation. We consider the legislation to be adequate, but consistent application in practice is necessary.

70 | Current publications and case laws have focused on other aspects of waste legislation: for example, the imposition of corrective measures (see Petrmichl), reuse of mining waste (see Vícha), or the landfill fee (see Constitutional Court ruling, case number Pl. ÚS 21/21 of March 19, 2025).

71 | Slavík, Dolejš & Rybová 2021, 177–186.



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