



Technical note accompanying the EEA briefing ‘Economic instruments and separate collection – key instruments to increase recycling’

June 2023

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1 Explanation of the methodology for the colour codes used in Table 1 of the briefing

The instruments have been assessed according to the following criteria. More details are available in the [methodology documents of the EEA's early warning assessments](#) (ETC/CE & ETC/WMGE, 2022). The assessment relates to the situation as of spring 2022.

Landfill tax and/or ban for landfilling residual or biodegradable waste	Ban, or landfill tax > 30 EUR/t with escalator, or landfill tax > 45 EUR/t Tax rates are adjusted using purchasing power parities to improve comparability across countries	Landfill taxes > 30 EUR/t Tax rates are adjusted using purchasing power parities to improve comparability across countries	No landfill taxes or low tax (< 30 EUR/t) Tax rates are adjusted using purchasing power parities to improve comparability across countries	
Tax on waste incineration	Taxes > 7 EUR/t with escalator, or tax > 18 EUR/t Tax rates are adjusted using purchasing power parities to improve comparability across countries	Taxes > 7 EUR/t, but without escalator Tax rates are adjusted using purchasing power parities to improve comparability across countries	No incineration taxes or taxes < 7 EUR/t Tax rates are adjusted using purchasing power parities to improve comparability across countries	N/A (for countries without capacities for incineration)
Application of Pay-as-you-throw schemes (PAYT) – population coverage	PAYT scheme fully rolled out (to at least 80% of the population) OR Implemented in some regions / municipalities (50-80% covered) and firm plans for rolling out to at least 80% of the population	PAYT scheme implemented in some regions/ municipalities (50-80% of population covered) OR No or less than 50% of the population covered by PAYT but firm plans for rolling out	No or less than 50% of the population covered by PAYT	
Type of Pay-as-you-throw schemes*	Combined advanced and basic	Basic	Not applied	
Convenience and coverage of separate collection systems for the different household waste fractions**	A high share of the population is covered by high convenience collection services	A medium share of the population is covered by high convenience collection services	A low share of the population is covered by high convenience collection services	

* this category was not included in the early warning assessments, but has been developed and assessed for this briefing.

** see Section 6 of this Technical note for more details on the methodology



2 Overview of Landfill taxes and landfill bans

Source: [Early warning assessments related to the 2025 target for municipal waste and packaging waste](#), complemented with information received from Member States' authorities during the Eionet review of the draft briefing 'Economic instruments and separate collection – key instruments to increase recycling'

Austria	<p>Landfill taxes are regulated in the Austrian Act on the Remediation of Contaminated Sites BGBl. Nr. 299/1989, last amended by BGBl. I Nr. 104/2019 (Altlastensanierungsgesetz, 1989). In Austria a landfill tax has been introduced in 1989. The tax depends on the composition of waste and the standards of the landfill. Currently, for pre-treated municipal waste the landfill tax on a “mass-waste” landfill (Massenabfalldeponie) amounts to 29.80 EUR/t and has not been changed since 2012. For other waste streams, such as mineral waste, the tax has been continuously increased over the years (Altlastenbeitrag, 2021). Tax exemptions are laid down for specific waste treatment operations. For example, residues from incineration and co-incineration plants are exempted from the landfill tax (Federal Ministry for Sustainability and Tourism, 2017) as those waste streams are already taxed via a tax on the input in incineration (8 EUR/t).</p> <p>Since 1997, there is a landfill ban in place in Austria, which was fully implemented on 1 January 2004 with local exemptions until 31 December 2008. Waste with a total organic carbon (TOC) content of above 5 % is banned from being landfilled. Exemptions from the ban on landfilling of waste with TOC > 5 % are laid down in the Austrian Landfill Ordinance, e.g. for waste from mechanical-biological treatment (MBT), waste with a calorific value of max. 6 600 kJ/kg dry substance, residues from mechanical waste treatment with a calorific value of max. 6 600 kJ/kg dry substance and TOC of max 8 % (Deponieverordnung, 2008).</p> <p>For the government period from 2020 to 2024, an amendment of the Austrian Act on the Remediation of Contaminated Sites is planned with the aim of achieving a faster, more efficient and safe remediation of contaminated sites and to make a contribution to remediation of abandoned brownfields (Umweltbundesamt GmbH, 2021).</p>									
Belgium	<p>As BCR has no landfills within the region, it has no landfill tax nor a landfill ban.</p> <p>Flanders and Wallonia both have a landfill ban as well as a landfill tax. Their situation is summarised in Table.:</p> <p>Table: Landfill bans and taxes in Flanders and Wallonia</p> <table border="1" data-bbox="336 1420 1402 1794"> <thead> <tr> <th>Region</th> <th>Landfill ban</th> <th>Landfill tax (EUR/t)</th> </tr> </thead> <tbody> <tr> <td>Flanders</td> <td> <ul style="list-style-type: none"> – Since 1998, ban on separately collected waste; – Since 2000, ban on combustible waste (TOC > 6 % and LOI > 10 %); – Since 2007, ban on biodegradable waste. </td> <td> <ul style="list-style-type: none"> – 107.87 EUR/t for combustible waste; – 59.33 EUR/t for non-combustible waste. </td> </tr> <tr> <td>Wallonia</td> <td> <ul style="list-style-type: none"> – Since 2004, ban on combustible waste (TOC > 6%); – Since 2007, ban on biodegradable waste. </td> <td> <ul style="list-style-type: none"> – 119.59 EUR/t for general waste; – 66.37 EUR/t for non-combustible waste </td> </tr> </tbody> </table> <p>Already in 2007, a landfill ban was introduced in Belgium (both Flanders and Wallonia) for biodegradable waste. At that time there already was a landfill ban applicable for combustible waste in both regions.</p> <p>The tax is levied on all Belgian waste to be landfilled, also on waste that is exported from Belgium for landfilling in other countries and on waste that is imported from other countries for landfilling in Belgium.</p>	Region	Landfill ban	Landfill tax (EUR/t)	Flanders	<ul style="list-style-type: none"> – Since 1998, ban on separately collected waste; – Since 2000, ban on combustible waste (TOC > 6 % and LOI > 10 %); – Since 2007, ban on biodegradable waste. 	<ul style="list-style-type: none"> – 107.87 EUR/t for combustible waste; – 59.33 EUR/t for non-combustible waste. 	Wallonia	<ul style="list-style-type: none"> – Since 2004, ban on combustible waste (TOC > 6%); – Since 2007, ban on biodegradable waste. 	<ul style="list-style-type: none"> – 119.59 EUR/t for general waste; – 66.37 EUR/t for non-combustible waste
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	<p>There is no algorithm or calculation method applied to determine the level of the tax, but considering the waste management performance of Flanders and Wallonia, the tax seems to have been effective in reducing landfilling of waste and in redirecting waste to incineration.</p> <p>The landfill ban and tax contributed to driving down the landfill rate of municipal waste, to a level of around 1 % of the generated municipal waste since many years.</p>
Bulgaria	<p>A landfill tax was introduced in Bulgaria in 2011. The tax was planned to increase to BGN 95 (EUR 50) per tonne by 2020. However, with the amendment of the Ordinance on landfill taxes the planned increase of the landfill tax was delayed by two years. It was then decided to increase the tax in a stepwise approach, from 69 BG/t (EUR 35) in 2020, to 82 BG/t (EUR 42) in 2021 and to 95 BGN/t (EUR 50) in 2022 and onwards (ExEA and MOEW, 2021). The plans to increase the tax show the intentions of Bulgaria to increase the economic incentives for recycling. The tax more than doubled during the last five years (from BGN 28 in 2015 to BGN 69 in 2020). Also in the coming years the tax will increase.</p> <p>When a municipality fulfils the goals set under Art. 31 of the Waste Management Act the landfill tax is reduced by 50 %. The purpose of the deductions as an economic instrument is to stimulate the municipalities to reduce the quantities of landfilled waste and as such increase the amounts of recycled and recovered waste and to accumulate funds for the construction of infrastructure for waste treatment. In cases where a landfill is used by several municipalities on a regional basis, the deductions are paid in proportion to the amount of landfilled waste (ExEA and MOEW, 2021). In 2018, 41 out of 265 municipalities fulfilled the set goals under Art. 31 of the Waste Management Act (preparation for reuse and recycling of waste materials, including paper and cardboard, metal, plastic and glass from households and similar waste from other sources of not less than 40 percent of the total weight of this waste) (ExEA, 2020).</p> <p>The landfill tax revenues are earmarked for use by municipalities to improve separate collection and waste treatment infrastructure for recycling or pre-treatment, to foster waste prevention and reuse and awareness raising of the public (ExEA, 2020).</p>
Croatia	<p>The Republic of Croatia has postponed the implementation of the disposal fee which is stated in the Waste management Act. Currently, according to the Environmental Protection and Energy Efficiency Fund (2021), there is a municipal waste charge in place, which is HRK 12 (corresponding to around EUR 1.6 in 2021) per tonne of municipal waste disposed. There is no landfill tax in place. Croatia has set a limit on the amount of biodegradable municipal waste landfilled to a maximum of 35 % of the total biodegradable municipal waste produced in 1997, but has no ban on landfilling.</p> <p>In addition, according to the Law on the Environmental Protection and Energy Efficiency Fund (OG 107/03, 144/12) there is a fee for the disposal of municipal waste and/or non-hazardous industrial waste in place. However, until today, payments for municipal waste disposal have never been implemented.</p> <p>There are plans to further incentivise the diversion of waste from landfills. In order to make waste disposal the least attractive waste treatment, there are plans for a waste disposal fee stated in the Law on Sustainable Waste Management (OG 94/13, 73/17, 14/19, 98/19) and the Law on Waste Management (OG 84/21). The implementation has been postponed until the completion of the World Bank project <i>Technical Assistance to the Ministry for the Transition to the Circular Economy</i>, which focuses on the analysis and application of the landfill tax or waste disposal fee.</p> <p>In addition, local authorities have to pay the incentive fee for non-compliance with the targets on collection of mixed municipal waste. This is an enforcement mechanism for the local government to implement measures to encourage separate collection of MSW, to meet recycling targets and to divert waste from landfill treatment.</p>
Cyprus	<p>Currently, Cyprus has no landfill tax in place. According to the new Recovery and Resilience Plan, a landfill tax will be introduced and planned to be enforced by 2024 as part of the upcoming tax reform. Prior to that, alternative treatment methods for municipalities to divert waste generated away from landfill are put into operation within the next three years. According to the recently amended landfill regulations, it is now banned to landfill waste that has been separately collected to prepare for reuse and recycling. The</p>



	waste from the subsequent treatment of separately collected waste (rejects), for which landfilling is the best environmental option, is exempted from the ban. By 2030, it will be prohibited to landfill any waste suitable for recycling or recovery, excluding waste for which landfilling is the best environmental option (Department of Environment, 2021).
Czechia	<p>In Czechia, a landfill tax was introduced in 1992. The basic tax rate for municipal waste has been CZK 500 (EUR 20) per tonne since 2009. According to the new Waste Act, in force since 1 January 2021, the landfill tax gradually increases from CZK 800 (EUR 32) per tonne in 2021, CZK 900 (EUR 36) per tonne in 2022, CZK 1000 (EUR 40), increasing annually to CZK 1850 (EUR 73) per tonne in 2029 for recoverable waste (Ministry of the Environment, 2021a). According to the Waste Management Plan 2015-2024, the increase of the landfill tax to CZK 1850 was foreseen to be implemented already in 2024 but it has been delayed to 2029.</p> <p>There are also other landfill taxes for other types of waste, namely for residual waste, hazardous waste, selected technological waste and remediation waste. Landfill tax rates are set out in sections 103 – 110 of the Waste Act (Czech Republic, 2020). The tax also has to be paid for the outputs of mechanical – biological treatment (MBT) and the residues from sorting plants (Ministry of the Environment, 2021a).</p> <p>There is a tax exemption for municipalities who do not have to pay for landfilling of recoverable waste if a certain maximum amount is not exceeded. In 2021 the maximum amount was 200 kg of municipal waste per inhabitant of the municipality, decreasing to 190 kg in 2022. The amount of waste exempted from this fee decreases over time. Recoverable waste is defined in section 40 (1) in the Waste Act. It is waste which calorific value in dry matter is higher than 6.5 MJ/kg, waste which exceeds the limit value of the biological stability parameter AT4 10 mg O₂/g of dry matter or waste which can be recycled efficiently, given the current state of scientific and technical progress (set in Annex 4 point E. in the Decree No. 273/2021).</p> <p>The reason for the exemption is to give time to municipalities to gradually transfer their waste management systems and prepare for a landfill ban. Also municipalities and their citizens should be motivated to increase separate collection of recyclable components of municipal waste and to produce less municipal waste that would be landfilled so they would have to pay only the lower fee (CZK 500) for landfilling their municipal waste (Ministry of the Environment, 2021a).</p> <p>According to the new Waste Act, from 1 January 2030 onwards, a landfill ban will be introduced for waste which calorific value in dry matter is higher than 6.5 MJ/kg, waste which exceeds the limit value of the biological stability parameter AT4, as set out in Annex 10 of the Waste Act, or waste which can be recycled efficiently, given the current state of scientific and technical progress, as specified in Section 40 (1) of the Waste Act (Czech Republic, 2020).</p> <p>Moreover, from 1 January 2021 separately collected municipal waste suitable for re-use or recycling, in particular paper, plastics, glass, metals, textiles and bio-waste cannot be landfilled anymore, with the exception of waste generated during processing, provided its calorific value in dry matter is lower than 6.5 MJ/kg and it meets the criteria laid down by the Ministry of the Environment (Section 36 (5) of the Waste Act). There are some other types of waste that cannot be landfilled anymore, as stipulated in section 41 (3) of the Waste Act (Ministry of the Environment, 2021a). Biodegradable waste can be landfilled if it is a biodegradable component of certain waste - 20 03 01, 20 03 02, 20 03 03 and 20 03 07, and only if the producer (municipality) ensures separate collection biological waste. Outputs from facilities for composting of biodegradable waste can only be deposited in a landfill if they do not meet the requirements for inclusion in groups 1 to 3 according to the decree (high-quality composts). The output from the treatment of biodegradable waste can only be landfilled if it meets the biological stability parameter AT4 and later the calorific value in dry matter of 6.5 MJ/kg. (Ministry of the Environment of the Czech Republic, 2023)</p>
Denmark	Denmark has a landfill tax in place since 1987 of 475 DKK/t (about 63.3 EUR/t) before VAT (about 79 EUR/t VAT incl.). Since 1997, there is also a landfill ban on recyclable and combustible waste (Danish Environmental Protection Agency, 2021; Skatteministeriet, 2020)
Estonia	In 2019, Estonia landfilled 17 % of the municipal waste generated. Estonia has collected a landfill tax since 1991. According to Environmental Charges Act a tax for hazardous and non-hazardous waste is currently 29.84 EUR/t. The Ministry of the Environment of Estonia (2021) reports that they have proposed the



	<p>increase of the tax but it has remained at the same level in the recent years. In addition, Estonia has the following waste disposal non-compliance fees:</p> <ul style="list-style-type: none"> • For hazardous and non-hazardous waste, landfilled quantities larger than permitted: fee 5 times higher than the usual fee, i.e. 149.2 EUR/t; • Hazardous and non-hazardous waste, landfilled without permit: fee ten times higher than the usual fee, i.e. 298.4 EUR/t. (Ministry of the Environment of Estonia, 2021) <p>A ban on landfilling unsorted mixed municipal waste has been in place since 2004. However, due to an existing regulatory exception that has enabled landfilling of unsorted or treated MSW, a large amount of unsorted mixed municipal waste is still being landfilled. In addition, Estonia has a partial landfill ban on biodegradable waste. Since July 2020, the share of biodegradable waste in municipal waste landfilled shall not exceed 20 % by weight. The allowed percentage has been gradually decreasing, as it was < 45 % since 2010, < 30 % since 2013 and currently being < 20 %. The stabilisation of waste containing less than 20 % of biodegradable waste is still necessary (Ministry of the Environment of Estonia, 2021)</p> <p>The landfilling of waste is regulated in the Waste Act. The amended waste legislation specifies the waste disposal requirements in accordance to the Landfill Directive, e.g. landfilling of separately collected waste is banned. In addition, the act <i>Procedure for sorting municipal waste and basis for classification of sorted waste</i> has been reviewed. While the previous act allowed the opportunity for source separation to be considered as pre-treatment for recovery or landfilling, the new act specifies pre-treatment requirements for source separated waste. (Ministry of the Environment of Estonia, 2023)</p>
Finland	<p>According to the Waste Tax Act (Government of Finland, 2020), a tax is due for landfilling any wastes specified in the appendix to the Act, including municipal solid waste and residual waste from mechanical treatment of waste. The tax amounted at 90 FIM/t, corresponding to around 15 EUR/t, in 1996. After that, the tax has increased in several steps, but since 1 January 2016, the tax has remained at 70 EUR/t.</p> <p>The MoE has recently published a report concerning the taxation of the waste that is landfilled (Laine-Ylijoki et al., 2020). The results showed that, in addition to the increase in the amount of the landfill tax, the tax base should be broadened to include more waste codes or all waste in the waste list. The impacts of broadening the tax base have been further studied in a project during 2021-2022. The taxation changes will be assessed based on the results of this study. (Ministry of the Environment, 2022a)</p> <p>In the Government Decree on Landfills 331/2013 (Government of Finland, 2021a) Finland introduced a landfill ban on biodegradable and other organic waste containing more than 10 % of organic substances (measured as total organic carbon (TOC) or loss on ignition (LOI)), which is applied since 1 January 2016. There are certain exemptions to the landfill ban on biodegradable and other organic waste described in the Decree. According to the Finnish authorities, these exemptions have not been widely applied to municipal waste. This can be also seen from the statistics, as the share of municipal waste that is landfilled is currently less than 1 %. (Ministry of the Environment, 2021b)</p>
France	<p>Since 2002, there is a ban on landfilling of untreated waste in place in France. According to the NAF ITEC/2017/0961 it is considered that the obligation of pre-treatment before landfill is fulfilled by the obligation of sorting at source. Source separated waste collected for recycling, and waste originating from municipalities and economic actors, who do not have source separation schemes in place, is banned from landfilling. Exceptional authorisations can be issued by the prefect under specific circumstances where landfill is the most beneficial situation (e.g. for corpses of animals which have died in a fire in a building containing asbestos, and which are contaminated by asbestos) (Ministry for the Ecological Transition/CGDD / SDES, 2021).</p> <p>In France, the general tax on polluting activities (Taxe Générale sur les Activités Polluantes or TGAP) is applied to landfilling. In 2020 a broad range of different landfill rates for different types of landfills was in place in mainland France and Corsica.</p> <ul style="list-style-type: none"> - 152 EUR/t for non-authorized landfills or non-authorized waste in authorized landfills (A); ⁽¹⁾. The maximum fee is intended to penalize the illegal operation of an unauthorized waste disposal site. - 25 EUR/t in authorized landfills with 75 % energy recovery from captured biogas (B);



	<ul style="list-style-type: none"> - 35 EUR/t in authorized bioreactor landfill cells with biogas recovery (C); - 18 EUR/t for bioreactor landfills with 75 % energy recovery from captured biogas (D); - and 42 EUR/t for other authorized landfills. <p>During the discussions on the finance bill which is voted on each year, the annual increase of this tax is decided. All rates (B-D), except for (A), will be increased to 65 EUR/t by 2025 and for category A landfills the rate will be 175 EUR/t (Code des douanes, 2019) (Ministry for the Ecological Transition/ CGDD / SDES, 2021).</p> <p>(1) Non-authorized once they are identified, they are subject to :</p> <ul style="list-style-type: none"> • an administrative procedure to lead to their regularization, either by obtaining an authorization, or by closure with measures (restoration, containment of waste, etc) • possibly, a penal procedure • possibly, a tax adjustment with application of the increased TGAP
<p>Germany</p>	<p>In Germany there is no landfill tax in place. Since 1993, there is a landfill ban for waste with a Total Organic Carbon content (TOC) above 3 %, which was introduced through an administrative regulation. Since June 2005, it was fully implemented with the Landfill Ordinance (Bundesministerium der Justiz und für Verbraucherschutz, 2009).</p> <p>There are, however, exceptions for soils, dredged material, ashes and asphalt. For mechanical-biologically treated waste, the threshold is a TOC of 18 % and a calorific value of 6000 kJ/kg dry substance (UBA-DE, 2021).</p>
<p>Greece</p>	<p>In 2019, Greece landfilled 78 % of the municipal waste generated. According to the EC (2019b), a landfill tax was introduced in 2012 through law, but its implementation was postponed and in parallel a gate fee for landfills was paid to the responsible competent operating bodies. The combination of a low landfill gate fee and cheap illegal landfills has not created any incentive to enhance recycling.</p> <p>According to the information available, the landfill fee took effect in the beginning of 2014. The rate of the fee was EUR 35 per tonne in 2014, and it was planned to increase by EUR 5 per tonne every year up to EUR 60 maximum. However, the fee was never paid in practice and was suspended as waste treatment plants were not ready yet to offer an alternative to landfilling (Hellenic Ministry of Environment and Energy, 2022). After the entry into force of the Article 43 of the Greek law on Waste Management No. 4042/2012 (Law 4042/2012 on Waste Management, 2012) in 2019, the landfill tax has been replaced by the so-called environmental contribution. Since the beginning of 2020, solid waste management bodies for waste management at regional level (FODSAs) pay for the amount of landfilled untreated municipal waste. Concerning the packaging waste collected using blue bins, the waste management of a residue generated in the sorting process by the KDAYs is the responsibility of a municipality, and the residue is not subjected to environmental contribution. Thus, the measure does not help in preventing the production of such residue. From the beginning of 2020 the fee is EUR 10 per tonne, and it is again planned to be increased annually by EUR 5 up to EUR 35 per tonne.</p> <p>In the NWMP for 2020-2030 an adoption of economic tools such as gradually increasing landfill tax and the implementation of PAYT schemes are introduced as means to diminish landfilling and enhance reuse and recycling. According to the law 4819/2021 transposing the WFD and PPWD into national law, from the beginning of 2022 a landfill fee is subjected to municipal waste disposed to landfills which are classified in chapter 20 and 15 01 of the European list of waste, and residual waste produced in KDAYs, in separately collected biowaste treatment facilities (MEVA), in MBT facilities, waste incineration facilities classified as 19 12 12, 19 12 10, 19 05, 19 06. The level of the fee will be EUR 20 per tonne in 2022 and it is to be increased annually by EUR 5 up to EUR 35 per tonne. From the beginning of 2026, the fee will be set at EUR 45 per tonne and in 2027 increased to EUR 55 per tonne, after which it shall remain constant. The fee will be paid to EOAN, and it will be used to support and fund mostly waste management actions (to municipalities and FODSA, including prevention, separate collection and recycling), to cover part of operation cost of municipal waste recycling facilities but also research and technology projects and in</p>



	<p>general actions for the protection of the environment. (Ministry of Environment and Energy, Secretariat-General for Waste Management Coordination, Directorate for Waste Management, 2021)</p> <p>There is no landfill ban currently in place. However, according to the law 4819/2021 transposing the WFD and PPWD into national law (Government of Greece, 2021), from the beginning of 2024 it will be prohibited to landfill textiles, electrical electronic equipment (EEE), products of daily hygiene, footwear, books unsuitable for sale or use, especially because of defects or faults in their packaging, labelling or weight, or because of withdrawal from the market or proximity to the expiry date, without the prior submission of a declaration of exhaustion of the waste hierarchy. (Ministry of Environment and Energy, Secretariat-General for Waste Management Coordination, Directorate for Waste Management, 2021)</p>
Hungary	<p>In 2019, 51 % of municipal waste generated in Hungary was landfilled. Hungary has been collecting a landfill levy since 2013. The levy started at HUF 3 000 per tonne in 2013 (equivalent to EUR 7.56 per tonne in June 2022), and was planned to increase by HUF 3 000 per year to reach HUF 12 000 per tonne in 2016 (equivalent to EUR 30.25 per tonne in June 2022), but the levy has been frozen since 2014 at HUF 6 000 per tonne. There are certain exemptions from the levy described in the Waste Act, but these do not apply to municipal solid waste, except for the part that no tax is payable on the dumping of non-hazardous waste (slag, ash, etc.) from incineration. According to the Ministry of Innovation and Technology (2021), no changes in taxation or bans are planned at present.</p>
Ireland	<p>In Ireland, a landfill levy of EUR 75 per tonne of waste is in place since 2013. No bans on the landfilling of residual municipal waste or biodegradable waste have been informed (Environmental Protection Agency, 2021). An exemption is in place for <i>stabilised waste arising from the biological treatment of the biodegradable fraction of municipal waste, to which fraction sewage sludge may have been added and which has undergone a separation process to remove plastic, metal or other non-organic material from the stabilised waste</i> (Minister for Communications, Climate Action and Environment, 2019).</p> <p>Under the European Union (Landfill) Regulations 2020 (Minister for Communications, Climate Action and Environment, 2020), Ireland has committed to put in place the necessary measures to ensure that:</p> <ul style="list-style-type: none"> • from 2020 the biodegradable municipal waste going to landfills is reduced to below 35 % of the total amount (by weight) of biodegradable municipal waste produced in 1995; • by 2035 the amount of municipal waste landfilled is reduced to 10 % or less of the total amount of municipal waste generated (by weight). <p>These measures might include additional taxes and/or bans for landfilling residual- or biodegradable waste.</p> <p>There is a commitment in the Waste Action Plan for a Circular Economy (Department of Communications, Climate Action and Environment, 2020), which establishes Ireland’s National Waste Policy 2020-2025, to introduce a waste recovery levy at EUR 5 per tonne. Additionally, the existing landfill levy of EUR 75 per tonne will be increased by EUR 5 per tonne of waste in tandem with the introduction of such waste recovery levy, as to maintain an incentivised price structure. This levy is already provided for in the Circular Economy, Waste Management (Amendment) and Minerals Development (Amendment) Bill 2022 which is due to be enacted by the end of June 2022. Another commitment is to ban textiles from the general waste bin, landfill and incineration.</p>
Italy	<p>In Italy, a nationwide tax for landfilling of residual waste was introduced by Law 549/1995 and subsequently revised by Law 62/2005. However, it is the individual regions that decide on the amount of the tax applicable in their territory, which cannot be less than 5.17 EUR/t and with a maximum of 25.82 EUR/t¹. These amounts are set yearly, through regional laws to be issued by 31 July of each year.</p>

¹ Pursuant to Article 26 of Law 62 of 18 April 2005



Article 205 of Legislative Decree no. 152/2006, set a minimum nation-wide separate collection target of 65 %, to be achieved by the end of 2012 at latest at the OTA level or, if such area is not established, at the municipality level. The article establishes that where the separate collection target is not achieved at the OTA level, an additional 20 % is applied to the landfill tax, to be paid by the Area Authority, dividing the burden among those municipalities of its territory that have not reached the minimum percentages. By means of a specific law, and after agreement with the Ministry of Ecological Transition (MiTE), the regions can indicate greater recycling and recovery objectives.

With respect to the monitoring of targets, the Legislative Decree no. 152/2006 gives the responsibility to the regions for the calculation and verification of separate collection rates, the development of compensation systems, and the definition of payment modes. Regional Environmental Protection Agencies (ARPA) are responsible for data validation and reporting to the regional authority, which, every year, defines the separate collection level for every municipality and OTA. The region, on its turn, shares the information on indicators and targets with the Ministry of Ecological Transition (MiTE), as to provide evidence on the implementation status of the measures defined in Regional Waste Management Plans (PRGR). OTAs use the PRGRs to define their local waste management programs and plans, which include separate collection targets. Local plans and the monitoring of the programmes' environmental impacts are subject to a Strategic Environmental Assessment (VAS) procedure. This may include monitoring of separate collection rates, which is performed by competent authorities with ARPA support.

In the national waste management plan, that will be developed according to article 198 bis of the Legislative Decree 152/2006, a strategic approach will be defined for increasing separate collection rates, providing criteria for planning, and seeking for achieving EU waste targets, establishing the corresponding policies and intermediate goals.

Where the collection targets have been achieved or exceeded, without prejudice to the minimum amount of 5.17 EUR/t, which can in no case be further reduced, the extent of the disposal tax can be modulated by the regions, according to the following table:

Exceeding the separate collection target level with	Corresponding landfill tax reduction (down to minimum 5.17 EUR/t)
0.01 % to 10 %	30 %
10 %	40 %
15 %	50 %
20 %	60 %
25 %	70 %

Such rewarding mechanism is in place in the regions of Abruzzo, Liguria, Lombardy, Marche, Puglia, Sardinia, Tuscany, Valle d'Aosta and Veneto (Ballabio, et al., 2020).

It is acknowledged that since its first adoption, the landfill tax (or *ecotassa* in Italian) has always maintained the maximum value of 50 000 lire per tonne, which then became 25.82 EUR/t with the advent of the Euro. This means that in the 25 years since its first introduction, the landfill tax has lost about a third of its real value, eroded mainly by inflation (Ballabio, et al., 2020).

Latvia

Latvia has introduced an escalator to increase the landfill tax as follows (MEPRD and LEGMC, 2021):

- Municipal waste from 25 EUR/t (in 2017) to 65 EUR/t (in 2021) and further to 95 EUR/t (in 2023)
- Hazardous waste from 45 EUR/t (in 2017) to 70 EUR/t (in 2021) and further to 100 EUR/t (in 2023)

The tax also covers outputs of MBT plants that are landfilled.



	Latvia is introducing a landfill ban for recyclable waste. The Waste Management Law states that it will be forbidden to landfill municipal waste suitable for preparation for re-use, recycling or recovery from 1 January 2030 (MEPRD and LEGMC, 2021).
Lithuania	In Lithuania, there is a ban on landfilling of untreated municipal waste, as well as a ban on landfilling of biodegradable waste from gardens, parks and green areas. In addition, there is a tax of 10 EUR/t in 2021 for the disposal of non-hazardous waste at landfills, with an escalator increasing the tax by 5 EUR/t annually up to 25 EUR/t in 2024. The tax covers also outputs of MBT plants that are landfilled. (Ministry of Environment, 2021). The landfill tax was increased to 50 EUR/tonne from the year of 2023. (Ministry of the Environment of the Republic of Lithuania, 2023)
Luxembourg	In Luxembourg, there is no landfill tax. However, the country's only landfill in operation currently applies a relatively high gate fee of 200 EUR/t for non-hazardous municipal waste (147 EUR/t when rescaled based on the purchasing power parity). In addition, there is a ban on untreated MSW and organic waste with a Total Organic Carbon content (TOC) above 5 % (Administration de l'environnement, 2021).
Malta	Malta has no landfill tax but the Deposit of wastes and rubble (fees) Regulations (S.L.549.07) establish in its Schedule C that the fee for landfilling of mixed waste is EUR 20 per tonne of landfilled waste. The new Waste Management Plan includes a measure whereby the Government will assess the feasibility of introducing a hierarchy of fees for facility gate fees to ensure full cost recovery for operational and environmental costs (Ministry for the Environment, Energy and Enterprises, 2022).
Netherlands	<p>In the Netherlands there is a landfill ban in place since 1995 on 35 waste streams, including combustible and biodegradable waste (Total Organic Carbon (TOC) > 5 %), thus banning the landfilling of mixed municipal waste. Since 2018, the ban applies to over 60 waste streams (Koninkrijksrelaties, 2022).</p> <p>Furthermore, the Netherlands introduced a disposal tax in 1995. This tax was repealed in 2012 and reintroduced in 2015. The waste disposal tax, which is adjusted yearly, is the same for landfill and incineration. In 2020 this tax was 32.63 EUR/t, in 2021 this was 33.15 EUR/t, and currently (2022) the tax is set at 33.58 EUR/t of waste. The tax is levied on all Dutch waste to be landfilled or incinerated, also on waste that is exported from the Netherlands for landfill or incineration in other countries (Ministerie van Algemene Zaken, 2015). For 2023, the waste disposal tax is 35.70 EUR/t (Belastingdienst, 2023).</p> <p>The disposal tax in the Netherlands is equal for any type of disposal (landfilling or incineration) and its level is adjusted annually. There are no specific guidelines or formula for estimating the level of the tax, but the government assesses it based on its effectiveness. The national authorities claim that in broad terms (depending on the material concerned and the geographical location of the municipality), the tax is sufficient for making recycling an economically more attractive option. In this way, the disposal tax in the Netherlands, including its annual readjustment mechanism, fulfils its purpose.</p> <p>The ban and disposal tax contributed to driving the landfill rate of municipal waste down, and it has been less than 2 % of the generated municipal waste since 2007.</p>
Poland	In 2019, Poland landfilled 43 % of the municipal waste generated. Poland has collected a landfill fee since 2001, but in 2018, based on the Regulation on unit rates of environmental fees, the fee was significantly increased. The fee was increased annually, being PLN 140 per tonne (corresponding to around 31 EUR/t in June 2021) in 2018, PLN 170 per tonne (corresponding to around 38 EUR/t in June 2021) in 2019, and PLN 270 per tonne (corresponding to around 60 EUR/t in June 2021) in 2020. The unit rate is indexed to the inflation index annually. There is an exemption in the tax concerning the waste from MBT with waste codes



	<p>19 05 99 and 19 06 04: in case the landfilled waste meets specific parameters (e.g. on respiration activity², ignition loss and organic carbon content) as laid down in the Regulation on unit rates of environmental fees, the fee shall be reduced to 25 % (approx. EUR 15) of the total rate. (Ministry of Climate and Environment, 2021)</p> <p>Poland has banned landfilling of separately collected biodegradable waste in 2013. In addition, since 2016 there has been a ban on combustible waste with a total organic carbon content (TOC) above 5 %, loss of ignition (LOI) value above 8 % and calorific value exceeding 6 MJ/kg in force. (CEWEP, 2020) The ban does not apply to waste from MBT with codes 19 05 99 and 19 06 04 (stabilised waste as output of MBT treatment) (Ministry of Climate and Environment, 2021).</p> <p>According to the Polish authorities, there are no changes planned to the taxation or bans (Ministry of Climate and Environment, 2021).</p>
Portugal	<p>In 2007 a landfill tax was introduced in Portugal. The tax increased steadily from 6.6 EUR/t in 2016 to 22 EUR/t in 2021. Further increases are planned, namely to 25 EUR/t in 2023, to 30 EUR/t in 2024 and 35 EUR/t in 2025. Information about the tax rates can be found in Articles 110 and 111 of Annex I of Decree-Law No. 102-D/2020 (Decreto-Lei n.º 102-D/2020, 2020).</p> <p>For landfills managed by municipal waste management systems, the tax rates depend on whether the waste sent to landfill would have been suitable for recycling or other material recovery. The tax is escalated when recyclable waste is sent to landfill instead of being recovered. The rates will increase based on the following scheme:</p> <ul style="list-style-type: none"> • by 10 percentage points in 2023; • by 20 percentage points in 2024; • by 30 percentage points in 2025. <p>For example, in 2025 the amount of waste not suitable for recycling/material recovery sent to landfill will be charged with a landfill tax of 35 EUR/t, whereas the amount of waste suitable for recycling/material recovery will be charged 130 % of 35 EUR/t, i.e. 45.5 EUR/t.</p> <p>In order to incentivise the separate collection or recycling at source of bio-waste, the tax is reduced based on the following scheme (APA, 2021):</p> <ul style="list-style-type: none"> • 10 percentage points, if the municipality shows to have separated and recycled at source or separately collected 5 % of bio-waste; • 30 percentage points, if the municipality demonstrates having separated and recycled at source or separately collected 15 % of bio-waste; • 50 percentage points, if the municipality shows to have separated and recycled at source or separately collected 30 % of bio-waste.
Romania	<p>After having been announced for several years, a nationwide landfill tax was effectively introduced in Romania in 2019 and landfilling of recyclables was banned. In 2019, the tax was 30 lei per tonne waste (eq. 6 EUR/t) and increased in 2020 to 80 lei per tonne waste (eq. 16 EUR/t), without distinction between residual or biodegradable waste, to discourage landfilling. Currently there are no plans to further increase the landfill tax nor to extend the existing landfill ban for recyclables to other waste types.</p>
Slovakia	<p>The Act on waste disposal fees (Act No. 327/1996 Coll.) implemented a landfill tax, called a fee in Slovakia, in 1996, but the rate of the fee was too low to induce enhanced separate collection (EC, 2019b). In the previous Early Warning Report by EC (2018a) it was recommended that Slovakia should perform a <i>“Revision of the landfill tax to ensure other residual waste treatment and disposal techniques (such as incineration) are also covered, so as to more effectively push waste up the hierarchy to the ‘preparation for reuse and recycling’ level, rather than just to the ‘recovery’ level.”</i> Another source states that <i>‘as many</i></p>

² Respiration activity is a parameter expressing the oxygen demand of the waste sample during 4 days, should be below 10 mg O₂/g dry matter. The ignition loss should be less than 35%, and organic carbon content should be less than 20% dry matter.



as two-thirds of all municipalities in Slovakia collected significantly lower amounts of fees for waste than the real costs were'. The calculation method for the determination of the landfill fee was changed in 2019, and the fee is now based on the sorting level of municipal waste to be deposited (CEWEP, 2020). The fee rates are applied to residual waste and bulky waste. Revenues from the fee are destined to the Environmental Fund, and can be used only for activities connected with waste management specified in the Act No. 587/2004 Coll. on the Environmental Fund as altered and amended. (Ministry of the Environment of the Slovak Republic & Slovak Environment Agency, 2021).

The sorting level is calculated as the amount of separately collected materials divided by the municipal waste generated in each municipality, thus incentivising separate collection (Ministry of the Environment of the Slovak Republic & Slovak Environment Agency, 2021):

Table: Calculation of the landfill fee based on the sorting level

Sorting level x (in percentage)	2020 (EUR/t)	from 2021 onwards (EUR/t)
$x \leq 10$	26	33
$10 \leq x \leq 20$	24	30
$20 \leq x \leq 30$	22	27
$30 \leq x \leq 40$	13	22
$40 \leq x \leq 50$	12	18
$50 \leq x \leq 60$	11	15
$x > 60$	8	11

A calculation provided by Denkstatt for the critical review of this assessment shows that in 2020, all counties reached a municipal waste separation rate above 20 % (Denkstatt/Ramboll Group, 2021).

Treatment of waste prior to landfilling will be mandatory from 1st of January 2024. Currently there is an amendment to Government Regulation No. 330/2018. It is still in the legislative process. The proposed change will significantly change the amount of fees in the following years (with a graduation of the amount of the fee depending on whether the waste from the waste treatment facilities meets the parameters of biological stability). The proposed fees are significantly higher than those currently in force. The amount of the fee will depend on whether the waste that passed through the waste treatment facility meets all parameters of biological stability (the proposed fee from 2026 onwards is 11 EUR/t), one of the parameters of biological stability (the proposed fee from 2026 onwards is 100 EUR/t), or does not meet the parameters of biological stability (the proposed fee from 2026 onwards is 200 EUR/t). However, these are proposals, it has not yet been definitively approved. (Slovak Environment Agency, 2023)

According to the Waste Act, it is not allowed to landfill sorted biodegradable waste from kitchens and restaurants, sorted fractions of MSW covered by EPR (excl. non-recoverable waste after final sorting), garden waste (excl. non-recoverable waste after final sorting), waste that has not undergone any treatment except inert waste, waste for which treatment is not technically possible, or waste of which treatment would not reduce the waste amount or not prevent danger to health or the environment. Untreated residual waste may be landfilled until 31 December 2022 in case separate collection of biodegradable waste, waste falling under EPR, hazardous waste, and collection and transport of bulky waste and small construction waste are organised in a municipality. From the beginning of 2023, all residual waste needs to be treated before its landfilling. The output from treatment needs to fulfil the parameters set for biological stability (AT4 < 10mg O₂/g dry matter, GS21 < 20 l/kg dry matter). A new ban on the disposal of biodegradable waste from wholesale, retail and distribution by landfilling was recently added to the Waste Act through amendment Act No. 372/2021 Coll. (Article I(4) of the Amendment, Section 13(e)(7)(7) of the Waste Act). This amendment will enter into force on 1 January 2023 (Ministry of the Environment of the Slovak Republic & Slovak Environment Agency, 2021).



Slovenia	Slovenia has a landfill tax of EUR 11 per tonne of landfilled non-hazardous waste. Since 2011, Slovenia has also introduced a landfill ban for biodegradable waste, based on calorific value and total organic content, including residual MSW and separately collected waste. (Ministry of the Environment and Spatial Planning, 2021; Government of Slovenia, 2021)
Spain	<p>The new Law on Waste and Contaminated Soils introduces a national landfill tax, in replacement of the taxes established by some of the regional authorities. The tax set at the national level establishes the minimum baseline, regional authorities (autonomous communities) can opt to increase this landfill tax in their respective regions. The tax distinguishes municipal solid waste (MSW) (40 EUR/t) and reject from treatment of MSW (30 EUR/t). In Spain, the rejects from mechanical biological treatment (MBT) plants represent about 65 % – 75 % of the volume of the initial MSW (Esteban-Altabella et al., 2020). No escalator mechanisms are included –nor foreseen to be included– on the national level.</p> <p>In general, the landfilling of waste without prior treatment is banned, and there is an express prohibition of the landfilling of separately collected waste and of unsold surpluses of non-perishable products such as textiles, toys or electrical appliances. However, the ban is not fully implemented as a considerable amount of untreated municipal waste is still landfilled. The national landfill tax introduced in the new Law on Waste and Contaminated Soil for a Circular Economy intends to discourage this practice. Nevertheless, it remains unclear how a tax can be established on an activity that is not permitted by law.</p> <p>In addition, a Ministerial Order is expected to pass before 1 January 2023, containing a list of waste that cannot be landfilled, which will include, among others, the prohibition of the direct landfilling of municipal waste that is suitable for preparation for reuse, recycling or other recovery.</p>
Sweden	Sweden has a ban on landfilling organic and combustible waste (Sveriges riksdag, 2001). There are some exemptions in the legislation, such as for waste containing less than 10 % TOC (Naturvårdsverket, 2004)). The county administrative board can also grant exemptions from the ban (Sveriges riksdag, 2001). Sweden also has a tax which applies to landfilling or storage (for a period longer than three years) of more than 50 tonnes of waste. There are some exemptions in the legislation, such as for recovery at site in landfill constructions and for treatment at site such as composting or digestion, combustion, or production of waste derived fuels (Sveriges riksdag, 1999). The landfill tax is yearly adjusted, in 2021 it is SEK 573 per tonne (Skatteverket, 2022).

3 Overview of incineration taxes in EU Member States

Source: [Early warning assessments related to the 2025 target for municipal waste and packaging waste](#), complemented with information received from Member States' authorities during the Eionet review of the draft briefing 'Economic instruments and separate collection – key instruments to increase recycling'

Austria	<p>The tax on incineration of waste including the production of Refused Derived Fuel (RDF) is laid down in the Austrian Act on the Remediation of Contaminated Sites BGBl. Nr. 299/1989, last amended by BGBl. I Nr. 104/2019. Since 2012 the tax amounts to 8 EUR/t, when it was increased from previously 7 EUR/t (Altlastensanierungsgesetz, 1989). No further increases are foreseen at the moment. In case the waste is exported for incineration the same rules and procedures apply as for domestic incineration, including production of RDF.</p> <p>With respect to treatment residues a tax has to be paid for the outputs of MBT or sorting plants that are landfilled. Residues from waste incineration in waste incineration plants which are landfilled or backfilled are, however, exempted (Umweltbundesamt GmbH, 2021).</p>
Belgium	<p>Flanders has nine waste incinerators (all R1 status) that also treat MSW. Wallonia has four waste incinerators (all R1 status) and BCR has one waste incinerator (with energy recovery).</p> <p>In all three regions an incineration tax is applicable to all waste entering the incineration facilities since several years. The tax is also applicable to waste exported for incineration outside the region. For export</p>



	<p>of waste, the amount of tax paid in the receiving country may be deducted and the remaining part is levied in Flanders. If the waste is pre-treated in the other country, the tax is levied on the landfill or incineration of the residue.</p> <p>BCR recently decided to increase the incineration tax to 15 EUR/t from 2022 onwards, and Flanders as well as Wallonia have plans to also increase their incineration tax, but are currently exploring the most effective way to do this in combination with other policy measures, in order to help shifting waste from incineration to separate collection (and recycling).</p> <p>Table: Incineration taxes in Belgium</p> <table border="1"> <thead> <tr> <th>Region</th> <th>Incineration tax</th> </tr> </thead> <tbody> <tr> <td>BCR</td> <td>2021: 6.43 EUR/t From 2022: 15 EUR/t</td> </tr> <tr> <td>Flanders</td> <td>2021: 13.38 EUR/t</td> </tr> <tr> <td>Wallonia</td> <td>2021: – 14.69 EUR/t, for incineration with energy recovery; – 68.33 EUR/t for incineration without energy recovery</td> </tr> </tbody> </table> <p>Belgium strongly relies on incineration for the disposal of mixed municipal waste, incinerating 43 % of the generated municipal waste in 2019. Reliance on incineration has been stable for the last 10 years.</p>	Region	Incineration tax	BCR	2021: 6.43 EUR/t From 2022: 15 EUR/t	Flanders	2021: 13.38 EUR/t	Wallonia	2021: – 14.69 EUR/t, for incineration with energy recovery; – 68.33 EUR/t for incineration without energy recovery
Region	Incineration tax								
BCR	2021: 6.43 EUR/t From 2022: 15 EUR/t								
Flanders	2021: 13.38 EUR/t								
Wallonia	2021: – 14.69 EUR/t, for incineration with energy recovery; – 68.33 EUR/t for incineration without energy recovery								
Bulgaria	Bulgaria has no incineration tax in place, and no plans to introduce such a tax. There are no dedicated incineration plants for municipal waste in the country, but refuse-derived fuel (RDF) generated in MBT and sorting plants is incinerated in co-incineration plants (ExEA and MOEW, 2021).								
Croatia	Croatia does not have waste incineration plants.								
Cyprus	Cyprus does not have waste incineration plants.								
Czechia	<p>Currently there is no incineration tax in place in Czechia and there is also no incineration tax planned.</p> <p>The Czech Ministry of the Environment is of the opinion that an incineration tax does not significantly support recycling in Czechia at the moment, because incineration and energy recovery of municipal waste was at 12 % in 2020 in Czechia, significantly below the EU average which is around 27 %. On the other hand, the landfilling of municipal waste was at 47.7 % in 2020. Therefore, the main issue for the Czech Republic in the following years is to address the high level of landfilling, not energy recovery. Therefore, the Czech Ministry of the Environment does not see the need to introduce an incineration tax at the moment as the incineration (with energy recovery) of the municipal waste is currently not seen as a barrier for recycling of MSW. If the situation changes, the Czech Ministry of the Environment is ready to revise its position regarding the introduction of an incineration tax in the mid-term horizon (Ministry of the Environment, 2022b).</p>								
Denmark	<p>Denmark has taxes on waste incineration via three different elements (Danish Environmental Protection Agency, 2021; SKAT (Danish Tax Authority), 2022; Miljøministeriet, 2022):</p> <ul style="list-style-type: none"> • An incineration tax since 1999 that totals 52.5 DKK/GJ in 2022, consisting of: <ul style="list-style-type: none"> ○ A tax on heat generated from waste incineration (20.7 DKK/GJ), which is indexed annually with the net price index ○ An additional incineration tax (31.8 DKK/GJ), which is not indexed. • A CO₂-tax since 2010 which is levied on incinerated non-biodegradable waste (179.2 DKK/tonne of CO₂ emitted), which is indexed annually with the net price index. <p>Due to the different tax bases for the three taxation elements, the taxes cannot easily be translated into a tax per tonne of waste. If an energy content of 10.6 GJ/tonne is assumed (Danish Ministry of the Environment, 2013), the incineration tax alone would be around 557 DKK/tonne, corresponding to 75 EUR/t.</p>								
Estonia	Estonia relies on waste incineration and almost half of the municipal waste generated is currently being incinerated. The Estonian authorities report that it has no incineration tax in place, neither is there a tax on waste exported for incineration. Estonia has considered a charge on incineration for waste handlers, but so far this has not been implemented. Estonia aims to discuss about the changes in taxation and								



	different charges after the analysis performed by the World Bank concerning the Estonian waste system that was finalised in 2021. (Ministry of the Environment of Estonia, 2021)
Finland	<p>Waste incineration is the most common method for the treatment of municipal solid waste in Finland. In 2019, Finland incinerated 56 % of the generated municipal waste. Finland has ten waste incineration plants and 24 co-incineration plants. In addition, one incineration plant and one co-incineration plant are under construction. Finland has rapidly increased waste incineration capacity; most of the capacity was built after 2012. The current incineration capacity of the ten plants is around 1.9 million tonnes per year (which corresponds approximately to 60 % of generated MSW), and the utilisation rate of combustion capacity is around 90 %. (Bröckl et al., 2021) The capacities are calculated according to the treated amounts. The actual capacity specifically available for MSW incineration is not precisely known as the plants' environmental permits also allow incineration of other waste such as C&DW and industrial waste. According to the latest estimates (in 2021) the current incineration capacity is able to treat the mixed municipal waste generated in Finland. Due to the agreements between municipalities and incineration plants there might occasionally be need for waste export as well. (Ministry of the Environment, 2022c)) The total annual capacity of co-incineration plants is around 1 million tonnes, but MSW is only seldomly incinerated in these plants. (Ministry of the Environment, 2021b, 2022a)</p> <p>In order to meet the preparing for reuse and recycling targets for municipal waste, Finland will have to reduce the amount of mixed municipal waste sent to incineration. This is likely to create a situation where the capacity exceeds the amounts of mixed municipal waste generated, requiring measures to discourage incineration. It seems that the Finnish policy has favoured waste incineration, as Finland has no incineration tax in place (EEA, 2016b). No additional taxation changes are planned on incineration either. (Ministry of the Environment, 2021b) The Prime Minister's Office has recently published a study concerning the impacts of waste incineration taxation and voluntary agreements (government's Green Deal programmes) on CO₂ emissions and the Circular Economy. It concluded that at the analysed tax levels, a waste incineration tax would not lead to considerable recycling or climate effects. (Bröckl et al., 2021) Therefore, the aim is to start preparing a government's Green Deal for the waste sector, including also the incinerators, which would target to increase the recycling rate and simultaneously reduce CO₂ emissions from waste incineration. If this proves ineffective or no Green Deal is prepared, Finland will consider imposing a waste incineration tax again or including waste incineration in the Emissions Trading System (ETS) (Ministry of the Environment, 2021b).</p>
France	<p>In France, the general tax on polluting activities (Taxe Générale sur les Activités Polluantes or TGAP) is also applied to incineration activities. During the discussions on the finance law which is voted on each year, the annual increase of this tax is decided (Ministry for the Ecological Transition/ CGDD / SDES, 2021).</p> <p>The incineration tax was implemented in 2009 and increased from 7 EUR/t in 2009 to 14 EUR/t in 2015. However, incineration with energy recovery and high energy efficiency are subject to a tax break (1.5 EUR/t in 2009 to 3 EUR/t in 2015) (EEA, 2016c). It is worth noting that more than 90 % of all operators subject to the incineration tax benefit from the tax break, potentially reducing the strength of the instrument. A substantial increase in the TGAP for thermal treatment facilities is planned, again with the aim of making reuse and material recovery more competitive. Thus, in 2025, the rates will be between EUR 7.5 and EU 25 per tonne of waste (Ministry for the Ecological Transition/ CGDD / SDES, 2021).</p>
Germany	Germany does not apply taxes on municipal waste incineration (UBA-DE, 2021).
Greece	Greece does not have dedicated municipal waste incineration plants.
Hungary	Hungary incinerated 13.5 % of the municipal waste generated in 2019 in the municipal waste incineration plant located in Budapest. Hungary has no incineration tax in place and there is no tax on waste exported for incineration. No additional taxation changes are planned on incineration either. To be able to drastically decrease the landfill rate and achieve the landfill target, Hungary plans to increase the energy recovery of residual municipal waste (Ministry for Innovation and Technology, 2021, 2022)
Ireland	No incineration taxes are in place in Ireland yet (Environmental Protection Agency, 2021), but the Circular Economy Bill 2021 (Department of the Environment, Climate and Communications, 2021a) projects progress to be made on this topic.



	<p>There is a commitment in the Waste Action Plan for a Circular Economy (Department of Communications, Climate Action and Environment, 2020), which establishes Ireland's National Waste Policy 2020-2025, to introduce a waste recovery levy at EUR 5 per tonne to be applied to, among other, the (co-)incineration of MSW. This levy is already provided for in the Circular Economy, Waste Management (Amendment) and Minerals Development (Amendment) Bill 2022 which is due to be enacted by the end of June 2022.</p>
Italy	<p>An eco-tax of an amount of 20 % of the ordinary landfill tax is due for waste incineration in incineration plants without energy recovery, classified as <i>D10 Incineration on land</i>, for MSW and residues from sorting, recycling and composting plants, and for sludge³ (Ballabio, et al., 2020). In 2019, only 3 % of incinerated municipal waste was incinerated without energy efficiency (Eurostat, 2021), so the tax has minimal effect.</p> <p>The amount of the landfill tax is determined at regional level, with a maximum of 25.82 EUR/t, which results in a maximum eco-tax for incineration without energy recovery of 5.16 EUR/t.</p>
Latvia	<p>Latvia has introduced an incineration tax of 15 EUR/t and this entered into force on 1 January 2021. It is currently not planned to review it. There is no tax on waste exported for incineration (MEPRD and LEGMC, 2021).</p>
Lithuania	<p>There is no incineration tax in Lithuania (Ministry of Environment, 2021). The Ministry of Environment commissioned a study to analyse the waste incineration tax proposal in 2017. Based on the results of this study the Ministry of Environment decided not to introduce such a tax. (Ministry of the Environment of the Republic of Lithuania, 2023)</p>
Luxembourg	<p>In Luxembourg, there is no tax on municipal waste incineration (Administration de l'environnement, 2021).</p>
Malta	<p>Malta does not implement a tax on incineration of MSW. Malta reported only minor levels of MSW incineration, which has decreased from 1.4 % in 2015 to 0 % in 2018 and 2019. The only waste incineration plant, the Marsa Thermal Treatment Facility, mainly incinerates industrial waste and hospital waste (Maltese Ministry for the Environment, Energy and Enterprises, 2021) and no incineration plant for MSW exists in Malta. According to the Waste Management Plan 2021-2030, Malta plans to invest in a waste incineration plant with energy recovery within four years (Ministry for the Environment, Energy and Enterprises, 2021, 2022; Ministry for the Environment, Sustainable Development and Climate Change, 2018)</p>
Netherlands	<p>In the Netherlands, the disposal tax is equal for both landfilling and incineration (33.58 EUR/t in 2022). The tax is also levied on waste that is exported from the Netherlands for landfill or incineration in other countries (Ministerie van Algemene Zaken, 2015) and thus equally discourages exporting of residual municipal waste for incineration or landfilling. Similarly, also outputs from MBT or sorting plants going to incineration are subject to the levy. In 2023, the waste disposal tax is 35.70 EUR/t (Belastingdienst, 2023).</p> <p>The Netherlands strongly rely on incineration for the disposal of mixed municipal waste, incinerating 42 % of the generated municipal waste in 2019. However, reliance on incineration has been slowly decreasing although it is unclear what the influence of the tax was in this development. As the analysis showed for the previous SRF, the Netherlands utilizes the incineration tax successfully in economically discouraging incineration of municipal waste.</p>
Poland	<p>Poland incinerated 23 % of the municipal waste generated in 2019. Poland has no incineration tax in place and there is no tax on waste exported for incineration. No additional taxation changes are planned on</p>

³ Article 3, c. 40, Law n. 549/1995, pursuant to which for waste disposed of in incineration plants without energy recovery or in any case classified exclusively as disposal plants by means of operation '*D10 Incineration on land*', for the residues and overflows of automatic sorting, recycling and composting plants, as well as for the sludge, a tax is due in the amount of 20 percent of the amount of the landfill tax.



	incineration either. However, waste incineration plants need to pay environmental fees for gas and dust emissions. (Ministry of Climate and Environment, 2021)
Portugal	<p>The current tax levels for incineration and energy recovery (treatment operations D10 and R1, respectively) are 85 % and 20 % of the landfill tax, respectively. So currently, in 2021, the landfill tax amounts to 22 EUR/t, the incineration tax to 18.7 EUR/t, and the energy recovery tax to 4.4 EUR/t.</p> <p>In the case of dedicated incinerators with energy recovery managed by one of the municipal waste management systems, the tax amounts to 20 % of the landfill tax. It increases proportionally with the quantities sent to incineration which would have been suitable for recycling or other recovery activities. The following increases are planned:</p> <ul style="list-style-type: none"> • 45 percentage points in 2023; • 55 percentage points in 2024; • 65 percentage points as of 2025. <p>The tax is reduced with increasing separate collection based on the following schemes:</p> <ul style="list-style-type: none"> • 2.5 percentage points, if the municipality proves to have separated and recycled at source or selectively collected at least 5 % of bio-waste; • 5.5 percentage points, if the municipality demonstrates that it had separated and recycled at the source or collected selectively at least 15 % of bio-waste; • 8.5 percentage points, if the municipality proves to have separated and recycled at source or selectively collected at least 30 % of bio-waste.
Romania	Romania has no incineration tax and has no plans to introduce such a tax, because there are no incineration plants for municipal waste in the country.
Slovakia	Slovakia has two waste incinerators, but there is no tax on waste incineration nor tax on waste exported for incineration in place. No additional taxation changes are planned on incineration either. However, in the draft law amending the Waste Act currently under approval, a ban on energy recovery of waste that can be recovered or recycled is being proposed (Ministry of the Environment of the Slovak Republic & Slovak Environment Agency, 2021). While this is not an incineration tax, the "Government Regulation No. 38/2023 establishing the method of determining the amount of excess income from the sale of produced electricity..." which was introduced due to the current energy crisis, will also affect waste incinerators in Slovakia. (Slovak Environment Agency, 2023)
Slovenia	Slovenia does not implement a tax on incineration of MSW and is not planning to do so in the near future. (Ministry of the Environment and Spatial Planning, 2021)
Spain	<p>The new Law on Waste and Contaminated Soils introduces a tax on incineration at national level, in replacement of the taxes currently established by the regional authorities. Regional authorities (autonomous communities) can increase this national landfill tax in their respective region. On the national level, no escalator is included nor foreseen to be included.</p> <p>A Ministerial Order will establish a list of waste that can be prepared for reuse or recycling and that cannot be destined for incineration. Incineration, with or without energy recovery, and landfilling of separately collected waste for preparation for reuse and recycling are prohibited (Boletín Oficial de las Cortes Generales, Senado, 2022).</p> <ul style="list-style-type: none"> • MSW incineration facilities coded as D10: MSW 20 EUR/t and reject MSW 15 EUR/t • MSW incineration facilities coded as R01: MSW 15 EUR/t and reject MSW 10 EUR/t • Other incineration facilities: MSW 20 EUR/t and reject MSW 15 EUR/t
Sweden	Sweden used to have a tax on waste entering a waste incineration or co-incineration installation. The tax used to be SEK 125 per tonne, but was abolished from 2023 for political reasons. (Sveriges riksdag, 2023, 2019; Swedish EPA, 2021)



4 Overview of the use of pay-as-you-throw schemes in EU Member States

Source: [Early warning assessments related to the 2025 target for municipal waste and packaging waste](#), complemented with information received from Member States' authorities during the Eionet review of the draft briefing 'Economic instruments and separate collection – key instruments to increase recycling'

Austria	<p>In Austria, the whole population is covered by PAYT charging systems, as required by Austrian waste legislation and implemented by municipalities. The setting of fees falls under the competence of the relevant federal provinces (EEA, 2016a). According to the Austrian authorities, the responsible institutional levels for introducing PAYT schemes are the municipalities, waste management associations, and waste management operators. Different approaches are established in the regions in Austria.</p> <p>In cities, different approaches are taken compared to semi-urban or rural areas, with respect to collection frequency, container sizes and PAYT schemes. The PAYT cost models usually depend on the collection frequency, weight or volumes of waste generated and / or on the number and size of the waste bins provided (Umweltbundesamt GmbH, 2021). Some provinces also use pre-paid waste bags (Municipal waste management „Pay as you throw-system“, Land Vorarlberg/Austria, 2013).</p> <p>In Austria, bins for residual waste are provided for each building, and costs are accounted separately for each building. This is a very strong incentive for people living in semi-urban or rural areas to collect recyclables and packaging waste separately, as waste management fees can be reduced significantly by reducing the amount of residual waste. In urban areas, with multi-storey housing, where the bins allocated to a building are used by many households, the economic incentive to sort waste at source is weaker for an individual household (Umweltbundesamt GmbH, 2021).</p>
Belgium	<p>In BCR, door-to-door collection in plastic bags is the main collection system (around 70-80 %) for residual MSW. For apartment buildings (around 20-30 %) the residual waste is collected in containers. Inhabitants can buy the waste bags in stores and their price only covers the manufacturing price (so not including the costs of the actual waste management). Also the containers are free of charge. In BCR, no PAYT system is in place.</p> <p>In Flanders and Wallonia, a PAYT system is being applied, covering the entire region and all of the inhabitants. Municipalities charge a fee for the collection of mixed municipal waste and decide on the level of the fee, taking into account a minimum and maximum level imposed by the regional authority. Municipalities also decide on how the PAYT schemes are organised (volume based or weight based, and/or the number of collections) for door-to-door collection.</p> <p>There is no regulation on Flemish level in terms of fees for other waste streams than mixed municipal waste. In general, municipalities tend to have a fee for bio-waste. Most other waste streams, in particular those under EPR schemes, have no collection fee (e.g. paper and cardboard, WEEE, batteries, ...) or a very low fee (e.g. plastics packaging, metal packaging and drink cartons).</p>
Bulgaria	<p>In Bulgaria there is no Pay-as-you-throw (PAYT) system in place. PAYT is implemented already in the Local Taxes and Fees Act but it is not mandatory. Municipalities have the right to apply other ways to calculate the waste collection tax. The responsible authority for this Act is the Ministry of Finance and it is adopted by the Parliament. The Ministry of Environment and Water has the position that PAYT must be made obligatory (ExEA and MOEW, 2021). However, implementation is planned not earlier than 2024. According to the Local Taxes and Fees Act, Art. 67, paragraph (1), the amount of the fee for household waste for each</p>



	<p>obligated person shall be determined for a calendar year in compliance with the PAYT principle and will become effective from 1 January of the second year following the publication of the results of the population and housing census in the Republic of Bulgaria in 2021 (State gazette, issue 14/2021) (lex.bg, 2021). The results of the national census will be published at the end of 2022, which makes the effective date of the Local Taxes and Fees Act no earlier than 2024 (National Statistical Institute, 2022).</p>
Croatia	<p>An obligation for a PAYT scheme for municipal waste is laid down in the Waste Management Act and the Regulation on municipal waste management. Criteria for PAYT are defined in the Waste Management Act. The local authorities can choose between the weight-based system or a system based on collection frequency and the size of the container. (Ministry of Economy and Sustainable Development, 2021)</p> <p>In 2020, 507 out of 556 local self-government units (LSGUs) had a PAYT system in use. The majority of the LSGUs used a system based on collection frequency and the size of the container (Ministry of Economy and Sustainable Development, 2020). Based on the information from IRDJU (izvješća o radu davatelja javne usluge, reports on the work of the public service provider), more than 3.9 million people live in these 507 LSGUs, which would mean that more than 90 % of the population is covered by PAYT schemes.</p> <p>According to the Waste Act (Official Gazette 84/21), public service providers have to base the fees for the private and commercial users of the collection system on the amount of mixed municipal waste, combined with a fee for the obligatory minimum public service which is independent on the waste amount. Collection of recyclable waste, including bio-waste, is free of charge, with the aim to incentivise separation at source.</p> <p>The system can be characterised as a weak PAYT scheme as the economic incentive to sort waste at source is not very visible to citizens compared to weight-based or sack-based schemes.</p> <p>The purpose of the Croatian PAYT system is to encourage waste producers and waste holders to separate waste at source for separate collection in order to reduce the amount of mixed municipal waste and reduce the share of biodegradable municipal waste in mixed municipal waste, as well as to reduce the amount of waste that is landfilled. (Ministry of Economy and Sustainable Development, 2021)</p>
Cyprus	<p>So far, only one municipality has implemented a PAYT scheme in Cyprus.</p> <p>A mandatory PAYT scheme that acts as a financial incentive will be introduced in the upcoming regulations. The aim is to implement PAYT nationwide in all municipalities, so that it will cover the majority of the population. Only very few remote communities are expected to not be covered by the system (Department of Environment, 2021).</p> <p>The system will be based on the use of prepaid bags for the residual waste. The Department of Environment (2021c) expects that the collection frequency of residual waste will decrease, mostly due to the separate collection of bio-waste.</p> <p>To this end, the Department of Environment has begun the implementation of the programme for the <i>Separate Collection System for Municipal Waste Source and Implementation of a Pay-As-You-Throw Scheme by local authorities</i>, under the Structural Funds. The purpose of the project is to support local authorities in implementing the obligations that will arise from the planned legislative reforms for the establishment of systems for the sorting at source and separate collection, of municipal waste, particularly organic waste, as well as for the establishment of pay-as-you-throw schemes within their administrative boundaries, including the creation of the appropriate infrastructure, implementation, monitoring, training and awareness raising. The programme will include:</p> <ul style="list-style-type: none"> • Design of separate collection systems for the following waste streams: paper/cardboard, glass, plastic, metal, organic/bio-waste (food, kitchen, garden and similar waste); • Establishment of separate collection at source and collection in other municipal waste streams, aiming at further preparation for reuse and recycling (e.g. clothing, furniture, bulky, plastics, hazardous household, etc.); • Upgrading of infrastructure and separate collection equipment where necessary; • Pricing policy through the application a PAYT system with a prepaid bag; • Awareness actions; and



	<ul style="list-style-type: none"> Dissemination of environmental information concerning the separate collection, treatment, reuse and disposal of municipal waste of various waste streams. <p>In June 2021, the Department of Environment announced the call to local authorities for expression of interest regarding the establishment of a separate collection system for recyclable and organic/bio-waste collection and implementation of a PAYT system. The call expired on 31 January 2022 and the Department of Environment is currently evaluating proposals. The next stage concerns the preparation of the relevant feasibility studies by the local authorities that submitted proposals, which are expected to be completed and submitted for approval to the Department of Environment in 2022. Implementation will begin in 2023.</p>
Czechia	<p>In Czechia, there is a PAYT system in place, covering about 20 % of the population. The PAYT systems are based on container size, weight or volume of waste, frequency of collection and in some municipalities a combination of all those elements. Every municipality decides if and if so, which type of PAYT system it will use to collect waste. Act No. 565/1990 on local fees (section 10i) (Act No. 565/1990 on local fees, 1990) is the legislative basis for municipalities for setting the fees for municipal waste collection and disposal services (Ministry of the Environment, 2021a).</p>
Denmark	<p>Denmark has a policy of full cost recovery for municipal waste collection which allows for the possibility of PAYT-schemes. As a principle, the fees for municipal waste management shall cover all costs related to the service. It is not allowed to cover cost for the service of collecting recyclables through the residual waste fee. The legal framework permits the use of PAYT by municipalities. Municipalities still often charge a flat rate for collection of both recyclables and residual waste, with some municipalities granting citizens a choice of the size of container, the larger container having a higher fee (Danish Environmental Protection Agency, 2021; Klima-, Energi- og Forsyningsministeriet, 2020). Recent information about the shares of the different systems is not available. A survey of Danish municipalities performed in 2015 indicated that container volume based fees and fees based on a combination of factors were dominant while there was very little use of weight based systems (Deloitte and Incentive, 2015).</p>
Estonia	<p>In the questionnaire the Ministry of the Environment of Estonia (2021) reported that Estonia has varying PAYT systems in use. Municipalities use varying charging systems, but none of them have a weight-based system. A municipality specifies the pricing model either in the tender or public procurement source documents for organising waste collection. Examples of the volume-based systems used in different municipalities are given below (the first two examples being the most used ones):</p> <ul style="list-style-type: none"> Fee for separately collected fractions (kitchen waste, paper and cardboard) is EUR 0.01 per lift per container regardless of its size; Fee calculated for residual waste on equal basis regardless the container size, e.g. emptying of 240 litre container is proportional to 1 m³; Fee for residual waste only; Fee for separately collected fractions (kitchen waste, paper and cardboard) up to 10 % of the fee for residual waste; Emptying a smaller container (e.g. 240 litres) is more expensive than emptying a bigger one (e.g. 1 m³). In this model private properties use 240 containers that are emptied once a month, whereas bigger containers are used by blocks of flats or companies, and they are emptied once or twice a week. Municipalities justify this kind of approach by resource savings achieved when emptying bigger containers and more waste can be collected at a time. This option is not supported by the Estonian authorities, as this approach is unequal for customers. (Ministry of the Environment of Estonia, 2021). <p>Generally, volume-based systems can be described as a weak type of PAYT. According to the estimate by the Ministry of the Environment of Estonia (2021) the coverage of the systems exceeds 50 % of the population, if all of the above-mentioned solutions are considered as volume-based PAYT. No uniform methodology to determine waste management fees however exists, and the systems and fees vary substantially. Commonly, the fee is defined per container volume and charged by the service providers, but it is difficult to assess whether and how much of the population is covered by systems that actually represent PAYT.</p>



	In summary, it remains unclear whether all of the examples presented above can be described as actual PAYT systems. Based on the information available, the coverage of actual PAYT systems remains still unclear.
Finland	According to the Finnish Ministry of the Environment, 100 % of the population is covered by a PAYT system. The basis for the PAYT is laid down in the Waste Act (Government of Finland, 2021b). Finland has a PAYT system for household waste throughout the country based on waste type, container emptying frequency, and container volume. Generally, volume-based systems can be described as a weak type of PAYT. For municipal wastes from other sources than households, both weight-based systems, and a system based on collection frequency and the size of the container are used, but the coverage of PAYT in these cases is not known. (Ministry of the Environment, 2021b)
France	In France, only about 9 % of the population is covered by PAYT charging systems (Ministry for the Ecological Transition/ CGDD / SDES, 2021). According to ADEME, the majority of these systems (84 %) relate to the frequency of collection and could be categorised as ‘weak’ as the economic incentive to sort waste at source is not very visible, while in some areas households are charged based on the weight (10 %) or volume (5 %) of collected waste. Some also use pre-paid waste bags (Ministry for the Ecological Transition/ CGDD / SDES, 2021)
Germany	In Germany, the principles and rules for defining waste collection fees are the responsibility of the municipalities, and there is no obligation for municipalities to apply PAYT systems. The current PAYT systems cover about 30 % of the population. The fees depend on the number of containers that were emptied per year or the amount of residual household waste disposed of (UBA-DE, 2021). PAYT systems are mainly implemented in rural areas and suburbs with single or double-family housing structure, less in areas with multi-family housing. Analysis shows that the amount of mixed municipal waste is on average 25 % lower when PAYT is applied (Dornbusch et al., 2020).
Greece	Currently, no PAYT schemes are used, with an exception of some small-scale pilot projects. The NWMP for 2020-2030 introduces an implementation of PAYT schemes as one mean to diminish landfilling and enhance reuse and recycling, and in the law 4819/2021 transposing the WFD into national law (Government of Greece, 2021), an establishment of PAYT systems is regulated. A mandatory PAYT shall be implemented from the beginning of 2028 by municipalities with a population exceeding 20 000 and as of 2023 for municipalities with a population exceeding 100 000. This obligation will be gradually applied to large municipal waste producers from the beginning of 2023 in accordance with the specific provisions laid down in law. Municipalities shall decide the waste streams applied, the liability to pay, as well as technical details. Concerning the application of the PAYT scheme to specific businesses such as catering, tourist accommodations, hotels, and industry more specific arrangements are set in the law 4819/2021. (Ministry of Environment and Energy, Secretariat-General for Waste Management Coordination, Directorate for Waste Management, 2021)
Hungary	National waste legislation describes the functioning of PAYT schemes but these are not mandatory. According to the Ministry for Innovation and Technology (2021), a PAYT system is not used as a separate system but it is generally part of its waste management. Within the public service system the container size, collection frequency and the amount of payment reflect the pay as you throw principle. The requirements for collection frequency and container size are described in Decrees on public waste management service. Based on this information, it is assumed that more than 80 % of the population is covered by this type of PAYT system. This system can be characterised as a weak PAYT scheme as the economic incentive to sort waste at source is not very visible to citizens compared to weight-based or sack-based schemes.
Ireland	In Ireland, all households with door-to-door collection are covered by PAYT charging systems. Different types of PAYT systems are used. Flat-rate fees for kerbside household waste collection have been phased out in the whole country in 2018. There to, the permits of all household waste collectors were amended by, among other measures, including the obligation of pricing structures for residual waste collection to contain a weight-based and/or per lift fee. Additionally, where fees are charged for the collection of recyclables, food waste and bio-waste, the fees should be lower than those applied for the collection of residual household waste.



	<p>A Household Waste Collection Price Monitoring Group (PMG) monitors the transition to a nation-wide implementation to PAYT collection systems. The monthly reports of the PMG can be found at gov.ie (Department of the Environment, Climate and Communications, 2021b). Currently eight different service plans are available in the companies that are monitored:</p> <ul style="list-style-type: none"> • e-tag; • Per lift charge, including a weight allowance, plus per kg charge for excess weight above allowance; • Service charge plus charge per lift per bin; • Service charge plus charge per lift per bin plus per kg excess charge; • Service charge plus per kg charge; • Service charge plus weight band charge; • Service charge, charge per lift per bin plus per kg weight charges • Service charge, including a weight allowance, plus per kg charge for excess weight above allowance <p>(Environmental Protection Agency, 2021)</p>
Italy	<p>ISPRA (Institute for Environmental Protection and Research, 2021) has indicated that in 2019 about 10.8 % of the population is covered by PAYT charging systems. This corresponds to 9.5 % of the total number of municipalities in Italy (Fise Assoambiente, 2021). In the Italian context, charged door-to-door collection is characterized by overall higher performance as compared to systems of free access waste containers on the road, in particular in terms of the quality of the differentiated fractions. Door-to-door collection also has resulted in increased separate collection, reduced residual waste per capita, increased capture and effective recovery rates, whilst simultaneously reducing the average household costs in regions and cities with door-to-door collection (Folli, 2018).</p> <p>In some cases, to optimize service costs, PAYT systems have been introduced that are shared by more than one household. This is the case for the so-called <i>condominiums</i> (apartment blocks), and in rural areas with low housing densities. Also some non-household waste collection points are equipped with containers that are shared among multiple users. In the latter case, users must identify a person responsible for compliance with the requirements of the Urban Hygiene Regulations (Institute for Environmental Protection and Research, 2021).</p> <p>Three different tariff types are in place (ISPRA, 2020):</p> <ul style="list-style-type: none"> • <i>Tari Tributo Puntuale</i>, corresponds to a variable part of the waste tax, that is calculated through the actual measurement of the quantity of waste at the ‘point of generation’; the application of such measurement systems envisaged by the Ministerial Decree of 20 April 2017 for this tariff is optional and not mandatory. • <i>Tariffa Puntuale Corrispettiva</i>, is a non-tax waste fee that can be applied by the municipal authorities that have implemented waste measurement systems at the ‘point of generation’. It is specifically aimed at guaranteeing the effective proportioning between the rate charged to each user and the actual service offered to and/or used by this user. The corresponding fee is regulated through the combined provisions of article 1, c. 667 and c. 668 of Law 147/2013 and, compared to the traditional tax on waste, it is characterized by a greater implementation of the polluter pays principle. For the asset-related waste fee, the application of the measurement systems provided for by the Ministerial Decree of 20 April 2017 is mandatory. This way, the waste tax is no longer exclusively based on presumptive parameters such as square meters or the number of family members, but also on the actual production of residual waste, through measurement at the ‘point of generation’. • Finally, the <i>Tariffa Puntuale Corretta</i>, is a non-tax waste fee. In this case, the distribution of the costs of the waste management service among the users consider, in addition to the precise measurement of the quantity of waste generated by each of them, the corrective systems foreseen in the provisions of article 9 of the Ministerial Decree of 20 April 2017. <p>The most used economic instrument in the waste management area in Italy is however still the TARI, the tax on waste. The tax for domestic users is not calculated according to the amount of waste generated,</p>



	<p>but instead on the surface area of the housing and its site; and the number of occupants. The system can be characterised as a weak PAYT scheme as the economic incentive to sort waste at source is not very visible to citizens compared to weight-based or sack-based schemes.</p>
Latvia	<p>Latvia has not implemented PAYT on a national basis. PAYT is currently only implemented in one municipality in Latvia (Jūrmala, as of 1 March 2018). However, it is concluded that the system in Jūrmala is too expensive in relation to the meagre results in separately collected waste (MEPRD and LEGMC, 2021).</p> <p>The National Waste Management plan for 2021-2028 presents plans to do a background study on the implementation of PAYT in Latvia. Several municipalities have already assessed the potential of introducing PAYT, and conclude that it would be too expensive to introduce PAYT in cities and towns with a majority of multi-apartment buildings. In rural areas with mainly single family houses it is considered possible.</p>
Lithuania	<p>Lithuania has a PAYT system for MSW collection for households served by door-to-door collection for mixed municipal waste both in cities, towns and suburbs and rural areas. Fees for households served by bring points for residual waste are calculated based on the average amounts of residual waste collected in a certain territory (e.g. a municipality) and thus depend on a collective effort. Based on information in Table 2.1 (Section Error! Reference source not found.) about the share of the population served by the different types of collection systems, it can be estimated that more than half but less than 80 % of the population is covered by PAYT systems. The fees for collection are based on residual waste collection volumes, whereas separate collection at bring points is free of charge, creating an economic incentive for sorting at source through the reduction of residual waste management fees. Municipalities can choose from three types/combinations of types of PAYT systems (Ministry of Environment, 2021; Lietuvos Respublikos Seimas, 2013):</p> <ol style="list-style-type: none"> 1) container size and amount of containers; 2) container size, amount of containers and frequency of collection; 3) weight of waste. <p>No overview is available on the actual implementation of the three types of PAYT systems across municipalities.</p>
Luxembourg	<p>In Luxembourg, municipalities are obliged to set waste collection fees based on the basis of the actual quantities of household and similar waste produced by individual households, either by weight or volume (PNGDR, 2018). A PAYT system is in place by weight for residual household waste and bulky waste, but the system is not rolled out completely (Administration de l'environnement, 2021). According to the Luxembourg authorities, approximately 60 % of the population is covered by a PAYT system which is mix between volume based, weight based or frequency of collection (Administration de l'Environnement, 2022)</p>
Malta	<p>Malta does currently not implement a pay-as-you throw system for MSW management (Ministry for the Environment, Energy and Enterprises, 2021).</p> <p>The Waste Management Plan covering the period 2021-2030 (Maltese Ministry for the Environment, Energy and Enterprises, 2021) includes a policy measure (WMRO_CW1) to explore the introduction of a service charge to implement the pay-as-you-throw concept.</p> <p>The introduction of PAYT will also be coupled with additional legislative initiatives whereby waste separation at source will be made mandatory.</p>
Netherlands	<p>In the Netherlands 50 % of the municipalities use a system for PAYT, which corresponds to a population coverage of 37 %. PAYT is mainly applied in small, non-urban municipalities in the Netherlands. The tariffs are mainly based on volume, frequency and/or weight. Most municipalities apply a system based on volume and frequency; another frequently applied system is based on volume (Table 2.1) (Rijkswaterstaat, 2022).</p>



Table: Overview of PAYT schemes in the Netherlands in 2021

Tariffing system	Municipalities (%) (number of municipalities)	Households (%)	Average number of households per municipality
Volume	3.4 (12)	3.1	20 228
Volume and frequency	23.3 (82)	16.7	15 707
Expensive bag	10.2 (36)	8.4	18 108
Expensive bag and number of persons	2.3 (8)	1.2	11 232
Weight	0.9 (3)	0.5	12 648
Weight and frequency	3.2 (11)	2.7	18 210
Weight, frequency and number of persons	0.3 (1)	0.1	11 450
Volume, frequency and number of persons	6.8 (24)	4.5	14 517
Total PAYT	50.4 (177)	37.3	16 221
Number of persons	44.8 (158)	57.0	27 871
Fixed tariff	4.8 (17)	5.8	26 135

In general, the cost for waste disposal decreases in municipalities where a PAYT system is applied, due to less residual waste.

Poland

According to the Ministry of Climate and Environment (2021), Poland has a PAYT system in use, but it is targeted only to non-household waste producers. The system is based on collection frequency and declared number of bags or containers. According to a 2021 survey, out of the 1 868 responding municipalities⁴, around 73 % indicated to use PAYT based fees for municipal waste from non-household waste producers. (Ministry of Climate and Environment, 2021).

However, the *Act on maintaining cleanliness and order in municipalities* states that the Municipal Council shall determine an increased waste management fee to property owners who do not fulfil the obligation to sort municipal waste at source. In this case, the increased fee should be two to four times higher than the regular rate. Furthermore, properties home-composting bio-waste can also be given a reduced waste management fee in proportion to the reduction of the costs of municipal waste management from households. (Council of Ministers of Poland, 2021)

There are no data about of the coverage of the PAYT system in Poland, but inspections reported by the Chief Inspectorate of Environmental Protection show that in all reviewed municipalities the delegated act to distinguish the price in 2020 was established (Główny Inspektor Ochrony Środowiska, 2021). The waste collector is also responsible for continuously verifying whether the owners of properties covered by the municipal system separate waste properly. If the property owner does not separate waste properly, the municipality charges an increased fee for the collection of mixed waste (Polish Ministry of Climate and Environment, 2022).

Portugal

According to the Portuguese Water and Waste Services Regulation Authority (ERSAR) there are three cities with PAYT tariffs. PERSU 2030 sets measures promoting PAYT systems. However, currently in Portugal there is no PAYT system in place which covers a major share of the population (APA, 2021).

Romania

National waste legislation provides that the local public authorities have the obligation to implement PAYT. The implementation of this economic instrument is based on at least one of the following elements: volume, collection frequency, weight or custom collection bags. At the beginning of each year the local

⁴ Poland has 2 477 municipalities – 1st January 2022 (<https://stat.gov.pl/statystyka-regionalna/jednostki-terytorialne/podzial-administracyjny-polski/>)



	<p>public authority in consultation with the sanitation operator establishes at least one of the above-mentioned implementation methods.</p> <p>In 2020, 2 111 out of the total 3 181 territorial administrative units (66 %) in Romania had implemented PAYT (Ministry of Environment, Waters and Forests, 2022).</p>
Slovakia	<p>According to the Institute for the Environmental Policy (2019), 167 municipalities, representing around 6 % of the municipalities and around 13 % of the population in Slovakia, had PAYT systems in place in 2018. In 2019, the coverage had increased to 15 % (192 municipalities) and according to the Slovak authorities, an increasing trend can be observed compared to the flat-rate collection (Ministry of the Environment of the Slovak Republic & Slovak Environment Agency, 2021). According to the data of the Statistical office of the Slovak Republic from 2021, 266 municipalities have introduced a PAYT system and cover 15% of the population (Slovak Environment Agency, 2023). No uniform system is used, but the schemes vary in each municipality. A volume based system based on collection frequency and volume of the container was the most common method in 2018 and used in 93 municipalities, whereas 69 municipalities use tag collection (citizens buy a tag in advance and put it on a full container when it needs to be emptied), and five municipalities use bins labelled with a barcode/QR code (the principle is same as in the tag system) (Institute for the Environmental Policy, 2019). The fees can be decided by the municipalities and vary in the range of 0.0033 EUR/l (or 0.0066 EUR/kg) and 0.0531 EUR/l (or 0.1659 EUR/kg). The Ministry of the Environment of the Slovak Republic & Slovak Environment Agency (2021) state that a generally binding regulation is needed to unify the system. There is a proposal in the legislative process that would introduce mandatory PAYT of mixed municipal waste for single-family detached houses (from 1st January 2025) and for apartments, respectively flat houses (from 1st January 2030) (Slovak Environment Agency, 2023).</p>
Slovenia	<p>Slovenia has a fully rolled out PAYT system, covering 100 % of the population. The Decree on the methodology for determining prices of obligatory municipal public services for environmental protection defines a methodology for pricing waste management services. The price is based either on waste container volume and the frequency of collection or by actual weight, however, the latter is not commonly used due to high costs. (Ministry of the Environment and Spatial Planning, 2021; Government of Slovenia, 2021)</p> <p>The system can be characterised as a weak PAYT scheme as the economic incentive to sort waste at source is not very visible to citizens compared to weight-based or sack-based schemes.</p>
Spain	<p>PAYT schemes are still scarcely applied by municipalities in Spain. In 2018, 16 municipalities out of almost 9 000 municipalities in Spain were found to have PAYT schemes in place. Moreover, the existing PAYT in Spain are volume-based, and there are no weight-based schemes (European Commission, 2019). These can be characterised as a weak PAYT scheme as the economic incentive to sort waste at source is not very visible to citizens compared to weight-based or sack-based schemes. The Spanish authorities (Ministry for the Ecological Transition and the Demographic Challenge, 2021) indicated that the draft version of the proposed Law on Waste would introduce some provisions aimed at advancing the implementation of PAYT systems, however, apart from a generic reference to the PAYT principle in article 11, and a mentioning of PAYT systems as an exemplary practice in Annex V, no such provisions were identified. As a preliminary step to the implementation of PAYT schemes, art. 11.3 of the new Law on Waste states that local authorities will have to introduce, on a mandatory basis, a specific and differentiated fee that reflects the real cost of municipal waste management .</p>
Sweden	<p>The dominating basis for waste fees in Sweden is based on container volume and collection frequency. Several municipalities have introduced a weight-based fee for waste collection. In addition, the size of the fee is smaller for bio-waste than for residual waste and in some municipalities, the collection of bio-waste is free of charge. The system can be characterised as a weak PAYT scheme as the economic incentive to sort waste at source is not very visible to citizens compared to weight-based or sack-based schemes. Only 33 out of 290 of the municipalities had a weight-based charge in 2019 (Swedish EPA, 2021; Avfall Sverige, 2020).</p>



5 Methodology for the categorisation of the convenience of separate collection systems

Separate collection is the collection where a waste stream is kept separately by type and nature so as to facilitate recovery operations, including preparation prior to recovery. Commingled collection of different waste fractions, in such a way that it does not hamper separation and recovery afterwards, can be regarded as separate collection in this assessment if it is in line with the conditions described in Art. 10(3) WFD. Fractions that are currently often collected commingled in Europe include plastic packaging, metal packaging and beverage cartons, with or without including paper and cardboard; the commingled collection of paper and cardboard with beverage cartons; or other combinations including the already mentioned fractions.

The convenience of a separate collection system for citizens will have an influence on the amounts and quality of waste collected through that system. A study conducted by ACR+ (2019) states that “door-to-door” systems and “bring bank” systems present on average comparable performances, and it seems that both types of collection enable very high performances. It does not necessarily mean that both collection modes would give the same performance in one given territory.

The convenience or service level and coverage of separate collection systems can also be different depending on the character of an area. A remote bring point (e.g. grocery store) could be considered convenient for people living in rural areas as it is part of a regular travel routine, where for people living in cities a bring point would have to be at walking distance in order to have the same level of convenience. In order to assess the convenience of separate collection systems in a MS, a distinction is made between various types of urbanization⁵: cities; towns and suburbs; and rural areas.

The following categorization is used here to assess the degree of convenience, depending on the degree of urbanization and type of material:

	Cities (densely populated areas)					Towns and suburbs (intermediate density areas)					Rural areas (thinly populated areas)			
	Door-to-door - separate	Door-to-door - co-mingled	Bring point (>5 per km ²)	Bring point (<5 per km ²)	Civic amenity site	Door-to-door - separate	Door-to-door - co-mingled	Bring point (>5 per km ²)	Bring point (<5 per km ²)	Civic amenity site	Door-to-door - separate	Door-to-door - co-mingled	Bring point	Civic amenity site
Residual waste	H		H			H		H			H		H	
Paper and Cardboard	H	H	H			H	H	H			H	H	H	

⁵ The degree of urbanization classifies local administrative units (LAUs) as cities, towns and suburbs or rural areas based on a combination of geographical contiguity and population density, measured by minimum population thresholds applied to 1 km² population grid cells; each LAU belongs exclusively to one of these three classes (Eurostat Glossary).



Ferrous metals	H	H	H			H	H	H			H	H	H	
Aluminium	H	H	H			H	H	H			H	H	H	
Glass	H	H	H	H		H	H	H	H		H	H	H	
Plastic	H	H	H			H	H	H			H	H	H	
Bio-waste	H					H					H			
food	H					H					H			
garden	H					H					H			
Textiles	H		H			H		H			H		H	
Wood	H		H			H		H			H		H	
WEEE	H		H			H		H			H		H	

H = high convenience

The population coverage by degree of urbanisation is determined using the amount of people living in the different types of urbanized areas ([Eurostat](#)).

Ideally, the assessment would be based on the shares of the population served by each type of collection system. However, this information is usually not available, and a proxy methodology is therefore used for assessing the share of population covered by high convenience collection services. Member States were therefore asked to indicate in the table above, which collection system is dominant in cities, in towns and suburbs, and in rural areas. If a certain system is dominant e.g. in cities and 40 % of the population lives in cities, the methodology assumes that 40 % of the population is served by this system, and so on. If no dominant system is indicated, it is assumed that the population coverage of each system in place is evenly distributed.

>= 80 % of the population is characterized as 'high share of the population'

50-80 % is characterized as 'medium share of the population'

< 50 % is characterized as 'low share of the population'.

If additional information is available next to the table with the crosses, this is taken into account, for example if there is data about how far separate collection of bio-waste is rolled out.

For WEEE, a slightly different approach is followed with regard to determining the coverage and convenience level, as under the WEEE Regulations, EEE retailers have an obligation to take back WEEE free of charge from end users. Therefore collection via bring points is considered to be the default situation and is assessed as 'medium convenience'. Regular or occasional door-to-door collection or any other additional collection service or initiatives to improve the collection of WEEE could be assessed as 'high to medium convenience'.

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