

# Early warning assessment related to the 2025 targets for municipal waste and packaging waste



**Croatia** 

June 2022

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# Acknowledgements

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# 1 Introduction

## 1.1 Background and purpose

The Waste Framework Directive 2008/98/EC (as amended by Directive (EU) 2018/851) includes a target to recycle and prepare for reuse, by 2025, 55 % of municipal waste generated. The Packaging and Packaging Waste Directive (94/62/EC as amended by Directive (EU) 2018/852) includes targets for the recycling of packaging waste, both in total and by material, to be achieved by 2025. The Landfill Directive (1999/31/EC as amended by Directive (EU) 2018/850) requires to limit the landfilling of municipal waste to 10 % of the generated municipal waste by 2035. The Directives also foresee that the European Commission, in cooperation with the European Environment Agency, publishes early warning reports on the Member States' progress towards the attainment of the targets, including a list of Member States at risk of not attaining the targets within the respective deadlines, three years ahead of the target dates. This assessment is a contribution from the EEA to the early warning reports according to Article 11b Waste Framework Directive and Art. 6b Packaging and Packaging Waste directive.

This document is an early warning assessment for Croatia. The document is based on the analysis of a number of factors affecting recycling performance (success and risk factors). The assessment aims at concluding whether Croatia is at risk of missing the targets for municipal waste and packaging waste set in EU legislation for 2025. In addition, it provides an early assessment of the prospects for meeting the 2035 target for landfilling of municipal waste.

The assessment takes into account information that was available before 10 May 2022.

## 1.2 Approach

The assessment follows a methodology developed by the EEA and ETC/WMGE and consulted with the Eionet in 2020 (ETC/WMGE, 2021), which was adjusted in 2021 taking into account experiences with applying the methodology in 2021 (ETC/CE & ETC/WMGE, 2022). This methodology uses a set of quantitative and qualitative success and risk factors that have been identified to affect the recycling performance. The assessment is to a large extent based on the information provided by the Member State in the reply to an EEA-ETC/WMGE questionnaire as well as on available data and information from Eurostat and other relevant sources. In addition, a consortium under contract with the European Commission (led by Rambøll Group) has conducted a critical review of the draft assessment in Q4/2021 and provided further information.

More specifically, chapter 2.1 assesses the likelihood for Croatia to achieve the target to prepare for reuse and recycle at least 55 % of municipal solid waste (MSW) for 2025. Chapter 2.2 assesses the likelihood for Croatia to achieve the overall packaging waste and specific packaging materials' recycling targets for 2025. Chapter 2.3 examines the prospects for Croatia to landfill less than 10 % of the generated municipal solid waste by 2035. The official early warning assessment for the landfilling target is only due in 2032 and accordingly the assessment contained in Chapter 2.3 is only preliminary.

### 1.3 Member State profile – context parameters

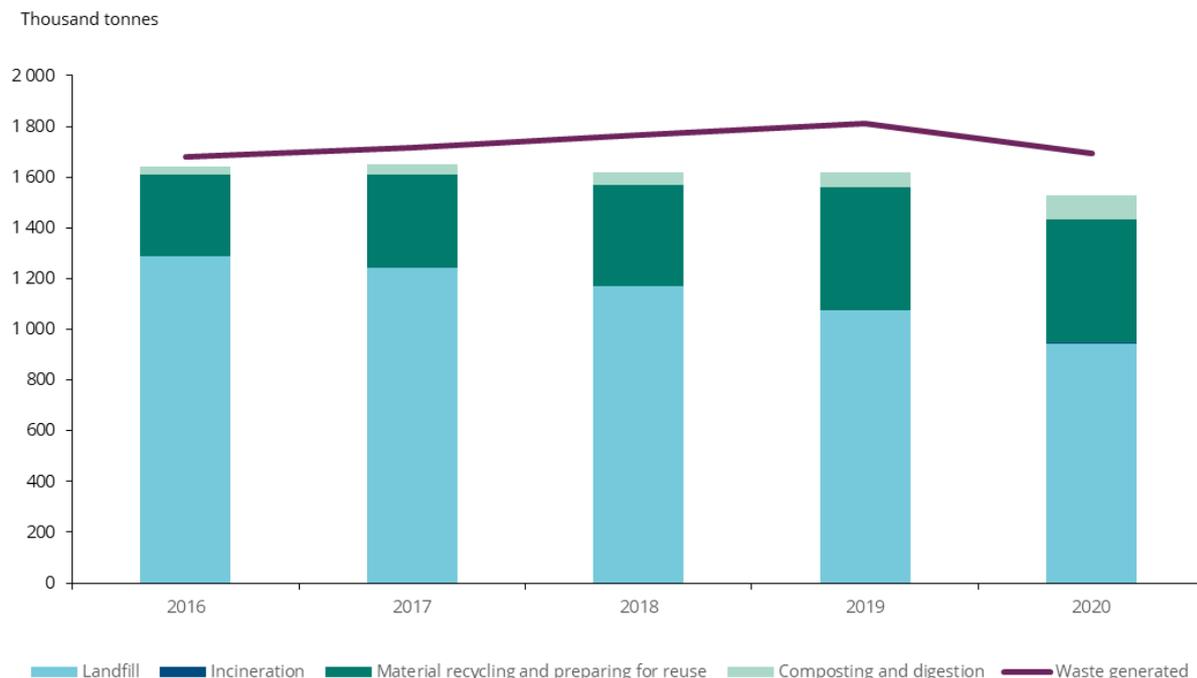
#### *Municipal waste generation and treatment*

Croatia generates around 1.7 million tonnes of municipal waste annually. This corresponds to 418 kg/cap in 2020, which is below the (estimated) EU average of 505 kg/cap. Generally, more waste is generated than what receives final treatment in Croatia; the difference between these figures has been increasing with waste generation increasing over the past five years (Figure 1.1). The difference between waste generation and final treatment is explained by waste treated by mechanical-biological treatment (MBT) (mass loss during biological treatment). In addition, 1 % of the population is currently not covered by municipal waste collection services, and the generated waste by these households is estimated and included in the waste generation data (Ministry of Economy and Sustainable Development, Institute for Environment and Nature, 2020).

The country still relies strongly on landfilling: although its share has decreased by 21 percentage points from 2016 to 2020, the share was still 55.7 % in 2020. Progress in material recycling was made, as the recycling rate has increased by 9.6 percentage points during the five-year period considered, but the increase in composting/digestion has been small, with 3.6 percentage points. Despite the past progress in recycling, the total recycling rate lies modestly at 34.3 %. Currently there are no municipal waste incineration plants in Croatia, but three companies have a permit for energy recovery of municipal and packaging waste. However, the combined capacity of these three plants together (i.e. allowed in their waste management permits) is only 204 000 tonnes. In 2020, only 2 825 tonnes of municipal waste was incinerated and recovered as energy.

According to the Croatian authorities, in 2020 three MBT facilities received 140 000 tonnes of municipal waste (MESD, 2022). The data on the output amounts from MBT and sorting facilities are not available. Croatia aims to increase the extraction of recyclables from mixed municipal waste, but only to a lesser extent as the recyclables should be primarily separately collected. (Ministry of Economy and Sustainable Development, 2021)

**Figure 1.1 Municipal waste generation and treatment in Croatia between 2016 and 2020, in thousand tonnes**



**Source:** Eurostat (2022a)

According to EC (2019) the main reasons behind Croatia’s modest performance stem from the fact that the planning of waste management is in suboptimal level, incentives are inadequate to carry out waste management according to the principles of the waste hierarchy, door-to-door separate collection is not efficient, tasks are not clearly allocated, coordination between the different administrative levels is missing, and the enforcement capacity is not adequate. Moreover, until recently, most of the improvements to the waste management services have been directed at the treatment of residual waste. In the meantime, the Republic of Croatia has adopted regulations that encourage separate waste collection and recovery or recycling, and EU funds have been used to finance projects for separate waste collection (civic amenity sites, waste separation equipment), waste sorting and biowaste treatment. The National waste management plan (NWMP) for 2017-2022 (also containing the waste prevention programme) aims to solve these issues. To implement the plan, the Ordinance on waste management was adopted in 2017. For example, support for separate collection of waste and composting of bio-waste, a waste tax to decrease landfilling, and claims for municipalities to meet the landfill targets and setting up pay as you throw (PAYT) schemes were set out in the Ordinance. In addition, some measures to decrease waste generation were included in the waste prevention programme. The EC concluded that a great deal of positive development has occurred in the field, but a crucial next step will be for this policy to be executed and enforced for Croatia to obtain actual results. (EC, 2019b)

### *Legal Framework*

The general legislative framework concerning waste and packaging is presented below:

- Act on Waste Management (Official Gazette 84/21)
- Regulation on Municipal Waste Management (Official Gazette 50/17, 84/19), Court solution USRH (Official Gazette 14/20)

- Ordinance on waste management (Official Gazette 81/20)
- Regulation on the management of waste packaging (Official Gazette 97/15, 7/20 and 140/20)
- Ordinance on packaging and packaging waste (Official Gazette 88/15, 78/16, 116/17, 14/2020, and 144/20)
- Decision on the areas of collection of non-hazardous packaging waste (Official Gazette 88/15)
- Ordinance on the management of waste textiles and waste footwear (Official Gazette 99/15)
- Ordinance on the methods and conditions of waste disposal, categories and working conditions for landfills (Official Gazette 114/15, 103/2018, 56/19)

A comprehensive list of legal and other provisions can be found on the web page of the [Ministry of Economy and Sustainable Development](#).

### *Waste management plan(s)*

Croatia's waste management plan (WMP) for 2017 – 2022 was adopted in January 2017 (Government of the Republic of Croatia, 2017). In this waste management plan, objectives have been set to reduce the total amount of municipal waste by 5 %, infrastructure planning, and prioritizing support for the separate collection of paper, cardboard, metal, glass, plastic and biodegradable waste with a focus on door-to-door collection. The WMP also envisages incentives for home and municipal composting, a waste management information system to support to waste streams monitoring, a series of educational and informative measures as well as the introduction of municipal waste disposal fees. The Waste Management Plan 2017 – 2022 was updated in January 2022 in order to harmonise it with Directive 2018/851 (Government of the Republic of Croatia, 2022).

The Waste Management Plan 2023-2028, which will be also harmonized with Directive 2018/851 is expected to be adopted in Q4 2022 (EC, 2022b).

### *Implementation of previous early warning recommendations*

Croatia had been considered of being at risk of missing the 2020 target of 50 % preparation for re-use / recycling for municipal waste by the European Commission (EC, 2018b) and it received a set of policy recommendations (EC, 2018a). Annex 1 lists the recommendations and a self-assessment of Croatia on the status of taking them into account.

### *Packaging waste generation and treatment*

In Croatia, 301 000 tonnes (74 kg/cap) of packaging waste were generated in 2019 (Figure 1.2), which is well below the (estimated) EU average of 177 kg/cap.

The total packaging waste generation has increased with around 37 % since 2012. This increase in waste generation, between 2012 and 2019, can be seen for all of the packaging waste categories:

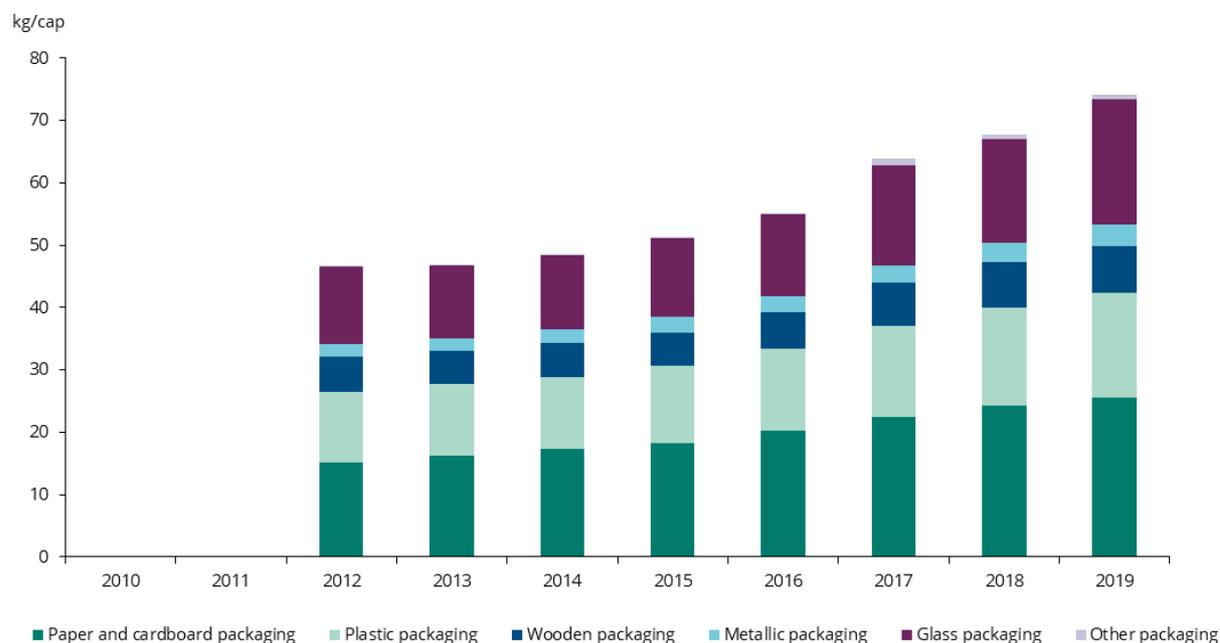
- for paper and cardboard packaging from 15 kg/cap to 26 kg/cap,
- for plastic packaging from 11 kg/cap to 17 kg/cap,
- for wooden packaging from 6 kg/cap to 7 kg/cap,
- for metallic packaging from 2 kg/cap to 3 kg/cap,
- for glass packaging from 12 kg/cap to 20 kg/cap, and
- for other packaging from 0 kg/cap to 1 kg/cap.

Between 2012 and 2019, the overall recycling rate for packaging waste has varied from 52.7 % in 2014, to 60.1 % in 2015, being 58.4 % in 2018.

Data on packaging put on the market is obtained by an EPR scheme. General estimates are not used to improve the data coverage (Eurostat, 2020). However, in the previous Early warning report by the

EC (2018a) it was estimated that the data on packaging put on the market (i.e. packaging waste generated) is seriously underestimated, which again leads to an overestimation of the recycling rates.

**Figure 1.2 Packaging waste generation in Croatia between 2012 and 2019, in kg per capita.**



**Note:** The data for the period 2010-2011 are not available.

**Source:** Eurostat (2022b)

### *Capture rates for recyclables*

The capture rate is a good performance indicator of the effectiveness of the separate collection system. The capture rate is calculated by dividing the separately collected weight of a certain material for recycling by the weight of the material in total municipal waste.

Based on data from the (MESD, 2022) on residual waste composition and separate collection volumes, the capture rates are calculated as the share of separately collected fraction to the total generation of that material. For Croatia the calculated capture rates for different waste fractions are presented in Table 1.1.

Table 1.1 Capture rates for different waste fractions in Croatia

	Residual waste composition (%) <sup>(a)</sup>	Residual waste composition (tonnes) <sup>(a)</sup>	Separately collected amounts (tonnes) <sup>(b)</sup>	Materials in total MSW (tonnes)	Capture rates (%)
Reference year	2015	2020	2020		
Mixed municipal waste, total		998 807			
Paper and cardboard	23.2 %	231 623	199 737	431 361	46 %
Metals	2.1 %	20 675	38 622	59 298	64 %
Glass	3.7 %	36 456	43 738	80 195	54 %
Plastic	22.9 %	228 427	66 384	294 811	22 %
Bio-waste	36.6 %	365 663	118 692	484 355	21 %
Textiles	3.7 %	37 056	3 737	40 793	8 %
Wood	1.0 %	9 788	23 273	33 061	69 %

**(<sup>a</sup>) Note:** Share of material in residual waste (household waste only) multiplied with the amount of residual waste in 2018 as reported by the Ministry of Economy and Sustainable Development (MESD, 2022)

**(<sup>b</sup>) Source:** As reported by the Ministry of Economy and Sustainable Development (MESD, 2022)

This indicates that there is room for improvement to capture higher shares of most generated recyclables, and especially textiles, bio-waste and plastics.

## 2 Success and risk factors likely to influence future performance

### 2.1 Target for preparing for reuse and recycling of municipal waste

This chapter aims at assessing the prospects of Croatia to achieve the **55 % preparing for reuse and recycling target** for municipal waste in 2025. For a detailed description of the methodology followed, the development of success/risk factors and their impact on recycling, please consult the Methodology report (ETC/CE & ETC/WMGE, 2022).

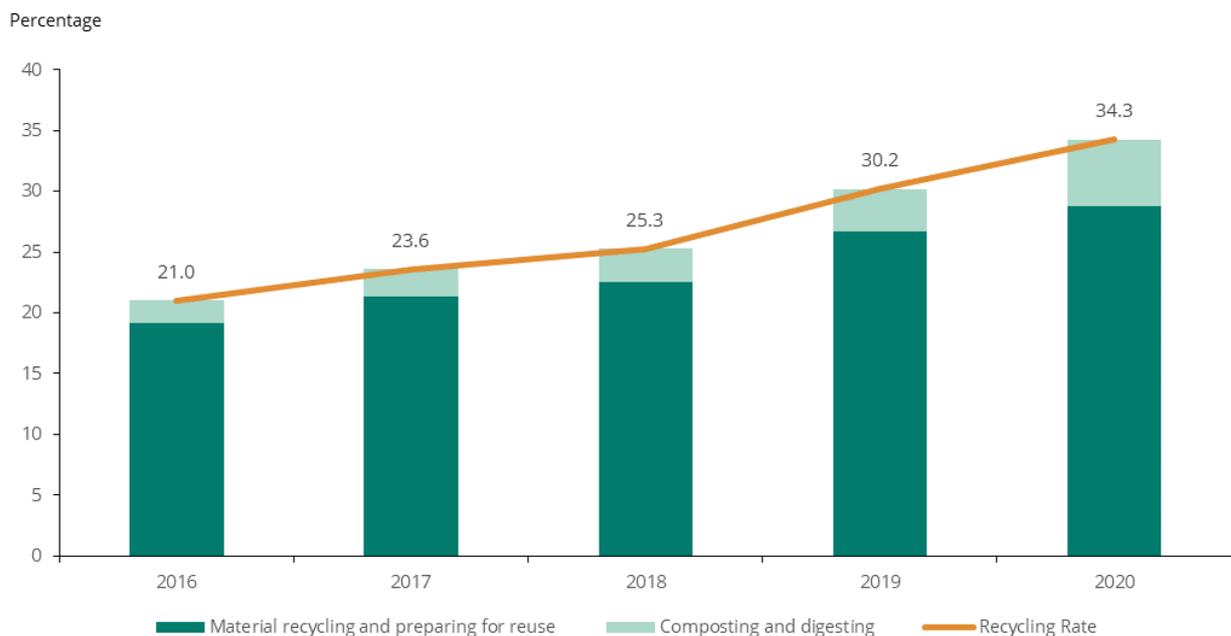
#### 2.1.1 Current situation and past trends

##### SRF MSWR-1.1: Distance to target

The overall recycling rate of Croatia was 34.3 % in 2020. For material recycling the recycling rate was 28.8 %, and for composting/digestion 5.5 % (Figure 2.1). Meeting the target will require an average increase of more than four percentage points annually in the period between 2020 and 2025, requiring a stepping up in pace compared to the average three percentage point annual increase in the previous five-year period (2016-2020).

In this analysis the recycling rate is calculated by dividing the summed amounts of recycling of materials and of composting/digestion by the total generated amounts. The data source used is the Eurostat data set *Municipal waste by waste management operations* [env\_wasmun] (following the OECD/Eurostat Joint Questionnaire); Data reported by Member States according to Article 10.2(a) of the Waste Framework Directive are not used for this assessment as the reporting methods differ by Member State, resulting in a lack of comparability between Member States. The data source used here is assumed to be the best available proxy given that data in accordance with the rules on the calculation of the attainment of the targets defined in Article 11a is not yet available.

Figure 2.1 Recycling rate in Croatia between 2016 and 2020, in percentage



Source: Eurostat (2022a)

The actual distance to the target for the most recent data point is a key factor determining the likelihood of meeting/not meeting the target. The closer the Member State is to the target already, the more likely that the target will be met. For Croatia, the recycling rate is 34,3 % in 2020, which is 20.7 percentage points from the target of 55 % in 2025.

However, the data used for this analysis are based on a different methodology than the calculation rules for the target. Croatia has not yet assessed the impact of the new calculation rules, but the Croatian authorities estimate that the change in the municipal waste recycling rate will not be significant. Processing of the data for the year 2020 is still under way, but approximate calculations in accordance with the new calculation rules will be performed after the data collection and validation has progressed further (Ministry of Economy and Sustainable Development, 2021). A few Member States have provided quantified estimates indicating how the application of the new reporting rules would influence the recycling rate (compared to the data reported to Eurostat under the Joint Eurostat/OECD questionnaire), resulting in reductions between 3.8 and 13 percentage points, and on average 5.5-6.7 percentage points. While the effect depends on how Croatia currently reports the data, an effect of a reduction with 5 percentage points is therefore assumed for this assessment, bringing the recycling rate down to 29.3 % in 2020. This assumption does not result in a change of the assessment for this SRF.

#### Summary result

Distance to target > 15 percentage points	Based on currently available data Croatia's recycling rate lies at 34.3 % which is 20.7 percentage points below the 2025 target. Considering however, the impact of the new calculation rules, we assume a reduction with 5 percentage points for this assessment, resulting in an estimated recycling rate of 29.3 %, 25.7 percentage points below the target.
Robustness of the underlying information	The currently available data do not yet reflect the calculation rules applicable to the target. Croatia has not yet assessed the influence of the new calculation rules on the recycling rate. However, a recycling rate below the currently reported one would not change the assessment for this SRF.

#### *SRF MSWR-1.2: Past trend in municipal solid waste recycling rate*

The recycling rate over the last five years shows a reasonable increase with 13.2 percentage points (Figure 2.1), indicating that Croatia has put an effort over the last years to increase recycling. The material recycling rate has increased by 9.6 percentage points, whereas the increase in composting and digestion has been smaller, with only 3.6 percentage points. In particular, between 2018 and 2019 the recycling rate increased by 4.9 percentage points, and by 4.1 percentage points between 2019 and 2020, which is a good progress for a single year towards reaching the target. If a similar pace could be maintained, it would still be possible for Croatia to reach the target of 55 % by 2025. Croatia is implementing supporting measures aiming to increase the recycling rate, which are described in more detail in section 2.1.2.

#### Summary result

RR < 45 % and increase in last 5 years > 10 percentage points	The recycling rate has increased by 13.2 percentage points over the past five years. For Croatia the application of the new calculation rules would result in an estimated recycling rate of 29.3%.
Robustness of the underlying information	There are no breaks in the time series data. The currently available data do not yet reflect the calculation rules applicable to the target.

## 2.1.2 Legal instruments

### *SRF MSWR-2.1: Timely transposition of the revised Waste Framework Directive into national law*

Timely transposition of the Waste Framework Directive as amended by Directive 2018/851 into national law within the foreseen period is key for a waste management system in line with EU requirements.

Croatia has not transposed the amended Waste Framework Directive into national law, more than 12 months after the deadline of 5 July 2020 (EC, 2021a). So far, five transposition measures have been communicated (EUR-LEX, 2021). Most of WFD provisions are transposed by the Waste management act, and the rest of the WFD will be transposed in the first half of 2022 through the Ordinance on waste management (MESD, 2022; Ministry of Economy and Sustainable Development, 2021).

### Summary result

No full transposition yet	The WFD has not been fully transposed into national legislation.
Robustness of the underlying information	Credible information received from the European Commission (status as of 12 November 2021) and from the Croatian authorities during the review of this assessment in April 2022.

### *SRF MSWR-2.2: Responsibilities for meeting the targets, and support and enforcement mechanisms, e.g. tools, fines etc.*

Clearly defined responsibilities, enforcement and support mechanisms for meeting the targets across different entities and governance levels are important for achieving high recycling rates. The clearer the responsibilities for meeting the target and the accountability for failing the targets are, the higher the chance that the targets will be met.

According to the Croatian authorities, the policy for MSW management is the responsibility of the following authorities and stakeholders:

- The Ministry of Economy and Sustainable Development is responsible for the development and implementation of national waste management policies;
- The Ministry of the agriculture for the development and implementation of national food waste management policies;
- The Environmental Protection and Energy Efficiency Fund manages the EPR system and is responsible for the coordination and control of collection and treatment of waste under the EPR;
- The Local and district (regional) self-government units are responsible for the conditions and implementation of municipal waste management in their area;
- The State Inspectorate supervises and monitors the implementation of the Waste Management Act and regulations adopted on its basis;
- The Public service providers are responsible for collection of residual and biodegradable municipal waste. (Ministry of Economy and Sustainable Development, 2021)

The competent waste management authorities and their responsibilities are defined in the Act on Sustainable Waste Management and the Regulation on Municipal Waste Management. The decisions of the local self-government units (LSGUs) specify how (the manner in which) public services are provided. (Ministry of Economy and Sustainable Development, 2021)

The LSGUs are obliged to ensure the management of municipal waste in their area through public service providers, which includes the provision of public services to users by collecting mixed

municipal waste, bio-waste, recyclable waste and bulky waste from users and civic amenity sites. Counties are responsible for the county waste management plan, records on waste management at the county level and issue a permit for non-hazardous waste for companies from the area of their county, register for collecting hazardous waste (since 31 July 2021 according to the new Waste Management Act) and participate in the management of the WMC. At the national level, the ministry is responsible for the national waste management plan and issuing permits for hazardous waste and for energy recovery operations (R1) and incineration on land operations (D10) for all type of wastes. Coordination at the local, county and national levels is continuous.

According to the Waste Management Act, fines ranging from HRK 10 000 to 100 000 (corresponding to around EUR 1 300 – 13 250 in April 2022) can be imposed for non-compliance with the provisions of the waste legislation for local and regional authorities. In addition, according to the Waste Management Act, local authorities have to pay an incentive fee to the Environmental Protection and Energy Efficiency Fund on the amount of residual municipal waste exceeding the amount prescribed (e.g. in 2021, residual waste should not exceed 54 % of the total amount of residual municipal waste generated in 2015 in the area). The incentive fee for non-compliance with the targets on collection of mixed municipal waste is an enforcement mechanism for the local government to implement measures to encourage separate collection of MSW and to meet recycling targets. Both the prescribed amount of residual waste and the level of the incentive fee was increased stepwise in the period from 2017 to 2022 (Eunomia, 2018). Funds raised from the incentive fee are used to finance separate collection of municipal waste. (Ministry of Economy and Sustainable Development, 2021).

The incentive fee is an economic instrument for increasing the separation and recycling of waste. In 2019, the method of calculating the fee was changed in order to better encourage local governments to implement measures to increase separation at source and reduce the mixed MSW generation. The fee is HRK 150 per tonne for 2020 and HRK 200 per tonne from 2021 onwards. Those local governments that have achieved the target rates of separate collection of MSW as set in the NWMP do not need to pay a fee.

In the previous Early warning report by EC (2018a) it was recommended that Croatia should consider increasing the incentive fees imposed on LSGUs failing to meet the targets as the current levels were assessed of being not high enough (e.g. for 2021-2022 the fee is HRK 200 (corresponding to around EUR 27 in May 2021) per tonne) and are probably lower than the costs of meeting the targets. According to the Croatian authorities, the topic was reviewed during the revision of the Sustainable Waste Management Act (Ministry of Economy and Sustainable Development, 2021), and the incentive fee calculation was adapted. In addition, according to the report by the EC, Croatia's modest performance is partly due to tasks and responsibilities not being clearly allocated and coordination between the different administrative levels is missing (EC, 2019b).

The Croatian authorities report that support mechanisms currently in place to improve the efficiency and performance of the responsible entities include co-financing for separate collection systems provided by the Environmental Protection and Energy Efficiency Fund, administrative supervision of local self-government's decisions on public service waste collection and an efficient communication with representative bodies. (Ministry of Economy and Sustainable Development, 2021)

In addition, the Ministry of Economy and Sustainable Development (MESD) provides support concerning data, monitoring, information systems and reporting. The LSGUs and municipal waste companies are responsible to fulfil several obligations concerning data reporting, ruled by the legislation, to enable monitoring of the waste management system performance at the local level. The MESD provides applications for reporting data, ensures yearly training of county officers responsible

for the validation of the data, and prepares guidance for companies. During the past two to three years new online databases and applications have been developed and the existing ones are being improved and updated:

- e-ONTO: a new database on waste transport and storage by waste management companies (for individual shipment);
- ELOO: a new centralised database to local municipal officers for reporting the location of illegally discarded waste;
- KB\*: a new application providing support on categorization of waste;
- New application for LSGUs for reporting on waste prevention projects or other activities (mostly educational and informative). Results available in Waste Prevention Portal;
- Waste Prevention Portal: information on waste prevention measures and activities;
- Environmental Pollution Register: yearly data delivered by waste producers, collectors and treatment companies, improvements made;
- ENVI portal: a portal containing GIS (geographic information system) spatial data on waste management, continuously updated; and
- OGO: waste management register. (Ministry of Economy and Sustainable Development, 2021) (MESD, 2022)

The Environmental Protection and Energy Efficiency Fund conducts informative and educational activities at national level in accordance with the Waste Management Plan of the Republic of Croatia for 2017-2022. For example, a campaign called *For an even more enchanting Croatia!* was organised by the Fund. As a part of the campaign, video and radio clips were published, informing children concerning different waste related topics. In addition, a large number of leaflets, brochures and other campaign materials were produced, and a contest *Reciklasičari (Recyclclassicals)* promoting reuse was held twice. The campaign is still active on social media and has gained more than 10 000 followers. In addition, campaigns aiming at diminishing the use of plastic bags, and promoting the reduction of packaging waste and waste sorting during holidays have been organised. (Ministry of Economy and Sustainable Development, 2021)

The Ministry of Economy and Sustainable Development co-financed 91 municipalities to conduct training and information activities on sustainable waste management with HRK 53.6 million through the Operational Program Competitiveness and Cohesion 2014-2020. Under the same program, the MESD has approved EU funding for waste management centre projects, as well as around EUR 500 million for more than 500 different projects on waste, separate collection and recycling. Almost two thirds of these projects have already been finalised successfully, including more than 170 civic amenity sites, 90 awareness-raising projects for citizens and distribution of more than 1 million bins and containers for separate collection of waste to 408 LSGUs, while the rest of the projects should be completed at the latest by 2023. (Ministry of Economy and Sustainable Development, 2021)

### Summary result

Clearly defined responsibilities, enforcement and good set of support mechanisms for meeting the recycling targets	Responsibilities are defined in the legislation and support and enforcement mechanisms are in place.
Robustness of the underlying information	Credible information received from national authorities through the EEA-ETC/WMGE questionnaire.

### 2.1.3 Economic instruments

#### *SRF MSW-3.1: Taxes and/or ban for landfilling residual- or biodegradable waste*

Bans and taxes on landfilling of residual municipal waste can help to discourage strong reliance on residual waste treatment and thus support recycling.

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.

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.

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 *Technical Assistance to the Ministry for the Transition to the Circular Economy*, which focuses on the analysis and application of the landfill tax or waste disposal fee.

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.

#### Summary result

No landfill taxes	Croatia has no landfill tax in place, and the municipal waste charge of HRK 12 per tonne of waste disposed is very low (corresponding to around 1.6 EUR/t in 2021 and to 2.3 EUR/t rescaled based on purchasing power parities) and will not create an incentive for diversion of waste from landfills. Croatia has set a limit on the amount of biodegradable municipal waste landfilled, but it has no ban on landfilling.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

#### *SRF MSWR-3.2: Taxes on municipal waste incineration*

Taxes on incineration of mixed municipal waste can help to discourage strong reliance on waste incineration and thus support recycling.

Croatia does not have waste incineration plants.

### Summary result

N/A (for countries without capacities for incineration)	Croatia does not have capacity for incineration.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

### *SRF MSWR-3.3: Pay-as-you-throw (PAYT) system in place*

PAYT systems are designed to incentivize citizens to make a bigger effort in separating their waste at source. However, a PAYT system should be designed with the appropriate level of source separation encouragement to ensure that citizens do not misplace waste in recycling bins in order to avoid residual waste charges. Overall, PAYT usually has a positive effect on source separation and thus recycling rates through direct involvement of citizens.

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)

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.

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.

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.

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)

### Summary result

PAYT scheme fully rolled out (to at least 80 % of the population)	Croatia has a widely rolled out PAYT system, mostly based on container volume and collection frequency.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

#### 2.1.4 Separate collection system

##### *SRF MSWR-4.1: Convenience and coverage of separate collection systems for the different household waste fractions*

Separate collection systems are a key enabler for high recycling rates and for collecting recyclables at adequate quality. Generally, the more convenient and accessible these systems are for their users, the better results they deliver. The assessment methodology categorises different types of collection systems (door-to-door, bring points with a density of > 5 per km<sup>2</sup>, bring points with a density of < 5 per km<sup>2</sup>, civic amenity site) for assessing the degree of convenience, and differentiates between cities (densely populated), towns and suburbs (intermediate densely populated) and rural (thinly populated areas). It then calculates which share of the population is served by which type of system. The assessment is done on a material basis and taking into account the different materials according to their average share in municipal waste. This is described in more detail in the methodology (ETC/CE & ETC/WMGE, 2022).

For Croatia, according to the most recent data, the percentage of households living in cities is 30.02%, in towns and suburbs 29.26% and in rural areas 40.72% (Eurostat, 2021).

For each LSGU, public service providers must report their activities on the so called “IRDJU form” containing general information on the public service collection area of residual and biodegradable municipal waste (e.g. reporting year, population, service users, employees), data on separate collection of different fractions, regularity of the system, quality of public service and economic efficiency of the collection (total yearly income and expense), public service tariff, as well as composition analysis of the municipal waste and treatment of the waste. (Ministry of Economy and Sustainable Development, 2021)

In 2020, all together 530 LSGUs (95 % of the total), of which 124 were cities and 406 towns and municipalities, reported separate collection of at least one municipal waste fraction from the following fractions: paper and cardboard, plastic, glass, and metal. 427 (77 %) LSGUs collected all four fractions separately. 26 (5 %) of LSGUs did not collect any of the four fractions separately. Also, around 48 % (269) of the LSGUs in Croatia collected bio-waste separately, mostly door-to-door, whereas 18 % (99) of the LSGUs reported to provide home-composters to interested citizens (MESD, 2022; Ministry of Economy and Sustainable Development, 2021).

Waste management operators use specific waste codes for differentiating packaging and non-packaging wastes. Waste transports (consignment notes) should be registered in the e-ONTO application. If packaging and non-packaging waste are mixed together, the operator estimates the share of packaging and non-packaging waste in the mixture case-specifically. The waste collected in the EPR system which is reported to the Environmental Protection and Energy Efficiency Fund is packaging waste only. (Ministry of Economy and Sustainable Development, 2021)

The separate collection of recyclables originating from businesses and companies is mandatory in Croatia. The requirement for separate collection from non-household sources is laid down in the Waste Management Act. Fines ranging from HRK 10 000 to HRK 100 000 (corresponding to EUR 1 300 – 13 250 in April 2022) can be imposed for non-compliance with the provision. (Ministry of Economy and Sustainable Development, 2021)

Table 2.1 gives an overview of the collection system in Croatia. The municipal collection systems used in Croatia do not distinguish between packaging waste and non-packaging waste, except for waste collected under the packaging EPR. Information in the table is based on the data reported by public

service providers on the *IRDJU form*. In Croatia, LSGUs are divided according to their population into cities (> 50 000 inhabitants), towns and municipalities (10 000 – 49 000 inhabitants) and smaller municipalities (< 10 000 inhabitants). In accordance with the Waste Management Act, the number of civic amenity sites in the local self-government unit (bring points) have been defined by the number of inhabitants in that local self-government unit. The availability of a mobile recycling yard should be ensured in settlements where a bring point has not been established.

Plastic and metal wastes can also be collected co-mingled. In some cases, door-to-door separate collection and bring point collection are equally important since, in addition to distributed bags and containers to households, it is still possible to use containers in public areas. In smaller municipalities door-to-door separate collection is more dominant compared to the larger cities where bring point systems in public areas are prevailing. However, door-to-door separate collection is increasingly being introduced and established also in the larger cities, as door-to-door separate collection of recyclable municipal waste from households is mandatory. (Ministry of Economy and Sustainable Development, 2021)

Since 2006, there have been extended producer responsibility systems in the Republic of Croatia for packaging, electrical and electronic equipment, batteries and accumulators, vehicles, lubricating oils and tires. Existing systems cover the costs of separate collection of waste from these products, the costs of its transport, treatment costs, the costs of providing appropriate information to waste holders, the costs of data collection and the costs of reporting to the European Commission. Basically, all the mentioned EPR systems function in such a way that the producers of products that place the mentioned products covered by EPR systems on the market in the Republic of Croatia are obliged to register, submit reports and pay the prescribed management fees to the Environmental Protection and Energy Efficiency Fund (EPEEF), which then fully covers the said costs from these fees.

**Table 2.1 Characterisation of the collection system in Croatia**

	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 <sup>2</sup> )	Bring point (<5 per km <sup>2</sup> )	Civic amenity site	Door-to-door – separate	Door-to-door – co-mingled	Bring point (>5 per km <sup>2</sup> )	Bring point (<5 per km <sup>2</sup> )	Civic amenity site	Door-to-door – separate	Door-to-door – co-mingled	Bring point	Civic amenity site
Residual waste	x					x					x			
Paper and Cardboard	xx		xx		x	xx		xx		x	xx		xx	x
Ferrous metals		x	xx		x		xx	xx		x		xx	x	x
Aluminium		x	xx		x		xx	xx		x		xx	x	x
Glass	x		xx		x	x		xx		x	x	x	xx	x
Plastic		x	xx		x		xx	xx		x		xx	x	x
Bio-waste*	xx				x	xx				x	xx			x
food														
garden														
Textiles	x		xx		x	x		xx		x	x		xx	x
Wood					x					x				x
WEEE	x			x	x	x			x	x			x	x
Composite packaging**	x		xx		x	xx		xx		x	xx		x	x
Other: expired medicines					xx					xx				xx

**Note:** xx: dominant system; x: other significant systems. Grey cells indicate high-convenience collection systems.

**Source:** Ministry of Economy and Sustainable Development (2021)

Door-to-door separate collection and high density bring point collection are equally important collection methods for paper and cardboard. Metals and plastics are collected in high density bring point collection and door-to-door co-mingled. High density bring point collection is the dominating collection method for glass waste. Door-to-door separate collection is the dominant collection system for bio-waste in Croatia but not applied in all municipalities. Textile waste is dominantly collected at high density bring points. Waste wood is only collected at civic amenity sites. Door-to-door collection is the only collection method reported for residual waste collection. For composite packaging waste, high density bring point collection is dominant. In addition, expired medicines are collected at bring points (Ministry of Economy and Sustainable Development, 2021).

For WEEE, depending on the county, category and type of WEEE, the EE waste holder can dispose of the waste free of charge and on-demand by calling a toll-free telephone number, sending an email or SMS or by registering via a web portal. Additionally, there are collection centers to self-dispose WEEE and there are organized collection actions by authorized collectors, in accordance with legal provisions (MESD, 2022).

Examining capture rates for recyclables gives an overview of the effectiveness of the whole collection system for the different materials (see Section 1.3). The modest capture rates for paper and cardboard, glass, plastics, textiles and bio-waste (between 8 – 46 %) show that their separate collection is not efficient and indicates that there is room for improvement of the separate collection system to capture higher shares of these waste fractions. According to the Croatian authorities, the main investments aimed to improve the separate collection were made in the period 2020-2021,

therefore significant results are only expected in the next two or three years. This will especially be the case for the bio-waste collection system.

### Summary result

Paper and cardboard	A high share of the population is covered by high convenience collection services	Door-to-door separate collection and high-density bring point collection are dominating collection methods for paper and cardboard.
Metals	A high share of the population is covered by high convenience collection services	Metals are dominantly collected at high-density bring points in cities. In towns and suburbs, door-to-door co-mingled collection and high-density bring point are equally important. In rural areas door-to-door co-mingled collection is dominating.
Plastics	A high share of the population is covered by high convenience collection services	Plastics are dominantly collected at high density bring points in cities. In towns and suburbs, door-to-door co-mingled collection and high-density bring point are equally important. In rural areas door-to-door co-mingled collection is dominating.
Glass	A high share of the population is covered by high convenience collection services	High-density bring point collection is the dominating collection method for glass waste.
Bio-waste	A low share of the population is covered by high convenience collection services	Door-to-door separate collection for bio-waste is the dominant system in Croatia. However, in 2019 only around 33 % of the LSGUs in Croatia collected bio-waste separately, corresponding to a low share of the population.
Wood	A low share of the population is covered by high convenience collection services	Civic amenity site collection is the only collection method for wood waste.
Textiles	A high share of the population is covered by high convenience collection services	High density bring point collection is the dominating collection method for textile waste.
WEEE	A high share of the population is covered by high convenience collection services	Civic amenity site collection is the dominating collection method for WEEE in Croatia. Additionally, in cities, towns and suburbs high-density bring point and on-demand door-to-door collection are equally important. In rural areas door-to-door and civic amenity site collection are the dominating collection methods..
Robustness of the underlying information		Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire. However, the described convenience of the collection system contrasts with the limited performance of the system in terms of capture rates and overall recycling rate for municipal waste.

### *SRF MSWR-4.2: Firm plans to improve the convenience and coverage of separate collection for the different household waste fractions*

According to the Croatian authorities, the separate collection system shall be updated in accordance with the requirements laid down in the WFD and PPWD. The NWMP and National Plan for Resilience and Recovery states measures to be implemented, aiming at strengthening the separate collection system, such as procurement of equipment, vehicles and vessels for the separate collection of paper, metal, plastics, glass, textiles and bio-waste, as well as constructing civic amenity sites and bring points

for the collection of waste and the construction of facilities for the treatment of separately collected waste. In addition, there are plans to support composting at home to increase the recycling of bio-waste. (Ministry of Economy and Sustainable Development, 2021).

For the improvement of the recycling in Croatia, the following projects are funded by EU funds (MESD, 2022):

- 212 civic amenity sites projects, EUR 61.2 million
- 9 sorting plant projects, EUR 20.7 million
- 8 composting plant projects, EUR 4.9 million
- 30 projects for recycling of construction and bulky waste, EUR 17.5 million
- 117 waste separation vehicles, EUR 18.1 million
- bins for separate waste collection, EUR 41.5 million

### Summary result

Paper and cardboard	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	
Metals	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	
Plastics	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	
Glass	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	
Bio-waste	There are plans to improve the collection service but unclear plan for implementation	Croatia plans to strengthen the separate collection system of bio-waste and to support composting at home to increase the recycling of bio-waste. EU cohesion funds have been allocated for the projects, but the impact on the coverage of high-quality services are unclear.
Wood	No firm plans to improve the convenience and coverage	The Croatian authorities indicate no plans to improve the service level of wood waste collection
Textiles	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	
WEEE	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	
Robustness of the underlying information		The funds allocated to the projects indicate they are well on their way, but for this assessment we lack information on the impact on system level, i.e. how will these projects impact the overall service level of the separate collection system.

### **2.1.5 Extended producer responsibility (EPR) and similar schemes**

#### ***SRF MSWR-5.1: Fee modulation in EPR schemes for packaging***

Within EPR schemes, fee modulation (or eco-modulation) is a system with different fees for different types of packaging material and designs. While basic fee modulation, i.e. different fees for the main material groups, are common, advanced fee modulation can create stronger incentives for packaging producers to design for recycling and thus create favourable conditions for higher recycling rates. The level of advancement of the fee modulation is assessed against four criteria that have been selected as benchmarks for a well-designed eco-modulated fee system:

- recyclability, for example differentiating between PET and PS, between different colours of PET, or between 100% cardboard boxes and laminated beverage cartons;
- sortability and disruptors, for example a malus for labels/caps/sleeves made of other materials, which are not fitted for the recycling technologies of the main packaging;
- recycled content; and
- if there is a transparent compliance check by the PRO that producers report correctly.

Croatia has an EPR scheme for packaging which was established in 2005. The schemes in place cover the separate collection costs, as well as the costs resulting from waste transport and treatment, providing adequate information to waste holders, and data collection and reporting to the EC. The Environmental Protection and Energy Efficiency Fund manages the EPR system. The producers of products covered by EPR pay the prescribed waste management fees to the Environmental Protection and Energy Efficiency Fund that fully covers the above-mentioned costs from the fees paid. In addition, producers are responsible to submit data on quantities and types of packaging put on the market to the Fund. The Fund is responsible for the coordination and control of collection and treatment of waste under the EPR, whereas the producers have no further commitments regarding waste collection or treatment. Currently, this is the only model in operation bringing producers, distributors or sellers, consumers, waste holders, waste collectors and treatment operators together, and the Fund is the only body to which producers should pay the fees. There are no non-profit PROs active in Croatia at the moment. All packaging waste, except hazardous waste, shall be handed over to the Fund, meaning that individual solutions are not allowed for the producers. (Ministry of Economy and Sustainable Development, 2021)

Hazardous packaging wastes constitute an exception on the above-mentioned, as the producers of products containing hazardous substances are obliged and responsible to organize the collection and treatment of hazardous waste generated from their products at their own expense. No fees are in place for placing on the market of products containing hazardous substances, as well as for collection and treatment of hazardous packaging waste, nor authorised collectors or treatment operators. (Ministry of Economy and Sustainable Development, 2021)

In Croatia, foreign companies selling packed products online are seen as producers and are thus responsible to pay the fees for waste packaging to the Fund. Foreign companies selling packed products completely online (without having a business space or point of sale) need to have an authorized representative in Croatia that is responsible for meeting the producer's commitments. The Customs Administration of the Ministry of Finance delivers data to the Environmental Protection and Energy Efficiency Fund concerning products put on the market in Croatia that originate from the countries outside the EU, meaning those under the producer commitments. Furthermore, the Ministry is in regular connection with the Customs Administration's inspectors concerning the clarification of regulations and situations governing the registration and fee payments, and related to the products placed on the market which are covered by the packaging EPR scheme. (Ministry of Economy and Sustainable Development, 2021)

In Croatia, EPR applies to both household and non-household packaging. There is no advanced fee-modulation in place, but the Croatian authorities report that a system of fee modulation is currently under discussion. (Ministry of Economy and Sustainable Development, 2021)

Currently, there are no concrete plans to change fees/taxes, but there are discussions ongoing related to the subject. For example, fee modulation in accordance with the WFD (and extension of the DRS to contain new beverage packaging material types) are considered. The fee modulation in the current EPR scheme is not based on criteria related to the circularity or toxicity of the packaging or product, and therefore they need to be modified and modulated in accordance with the WFD. The legislation is planned to be amended at latest in the 1<sup>st</sup> quarter of 2022. (Ministry of Economy and Sustainable Development, 2021)

Croatia received a set of recommendations to improve the EPR schemes (EC, 2018a) but these have not been implemented.

### Summary result

No advanced fee modulation	There is no advanced fee modulation based on the four assessment criteria presented above.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

### 2.1.6 Treatment capacity for bio-waste

#### *SRF MSWR-6.1: Capacity for the treatment of bio-waste*

Bio-waste is the largest single waste fraction in municipal waste, and adequate treatment capacity needs to be (made) available.

As reported by the Croatian authorities, the country's current bio-waste treatment capacity amounts to 985 273 tonnes. The capacity is estimated based on the waste management permits of composting and biogas plants. This capacity includes the treatment of municipal bio-waste but is mainly operated by the treatment of waste from agriculture and the food industry. Home composting is not included in the estimated capacity. (Ministry of Economy and Sustainable Development, 2021)

According to data of the Croatian authorities, 36.6 % of the residual municipal waste in Croatia is bio-waste (2015 data). Total MSW generation in 2020 Croatia was 1.69 million tonnes (Eurostat, 2021b), of which 998 806 tonnes was residual waste (MESD, 2022). This implies that the amount of bio-waste ending up in residual waste is 365 663 tonnes. According to the Croatian authorities, the amount of separately collected bio-waste in Croatia was 118 692 tonnes in 2020 (MESD, 2022). These together represent a total amount of about 484 355 tonnes of generated bio-waste in 2020. This indicates that in principle, the available capacity exceeds the amount of municipal bio-waste generated. However, this capacity is used for the treatment of waste from agriculture and the food industry.

In 2020, 35 % (192) of the LSGUs in Croatia collected bio-waste separately, mostly door-to-door, whereas 16 % (91) of the LSGUs reported to provide home-composters to interested citizens. The amount of separately collected bio-waste increased by 22 % compared to the previous year (MESD, 2022).

The Croatian authorities stated that the most important issues hampering the treatment of separately collected municipal bio-waste are related to the lack of treatment facilities, and the inadequate quality of separately collected bio-waste (mixing with other waste fractions). In addition, long distances to the treatment facilities are another impeding factor in almost all municipalities, but this is taken into account when planning new treatment facilities. For the improvement of the bio-waste treatment capacity in Croatia, EU funds are allocated for the construction of nine composting plants to a total value of EUR 5.5 million. (Ministry of Economy and Sustainable Development, 2021)

### Summary result

Bio-waste capacity below 80% of generated municipal bio-waste but firm plans to close the gap	The current bio-waste treatment capacity in Croatia is mainly used for the treatment of agricultural and industrial wastes. There are plans and allocated funds for increasing the treatment capacity of municipal bio-waste.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire and during the review of this assessment in April 2022.

### *SRF MSWR-6.2: Legally binding national standards and Quality Management System for compost/digestate*

To create a market for compost and digestate, compost should be of a good quality for use as a soil improver or fertilizer. Legally binding standards provide guarantees regarding the quality of the compost/digestate produced. A quality management system aims at addressing different elements of a production process to ensure a stable and high-quality output (product) which helps toward reaching a defined quality for the product.

The Croatian Ordinance on by-products and end-of-waste status (OG No. 117/14, Ministry of Environmental and Nature Protection (2014)) defines a national standard for compost from bio-waste through quality criteria for the end-of-waste status of three compost classes as well as anaerobic digestate used in non-food-producing agricultural crops. It defines limit values for heavy metals (Cd, Cr, Hg, Pb, Cu, Zn), PAHs, PCB, mass content of organic matter, fertile herb seeds, salmonella sp., Escherichia coli, plastics, metals, glass, and mineral matters. The Ordinance also prescribes a quality management system (Art. 6 (2) and (3)). The producers of composts or digestate can apply for end-of-waste status, when the application of the quality standards is mandatory. In order to use the compost or digestate on soil, it is mandatory to comply with end-of-waste criteria. The end-of-waste criteria are laid down in the (EU) Regulation 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003 entering this regulation into force.

### Summary result

Legally binding national standards for compost/digestate quality in place, and quality management system in place	Croatia has legally binding national standards for compost/digestate quality and compost/digestate producers can apply for end-of waste status, which is a condition for applying compost/digestate on soil. The system also includes a quality management system.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

## 2.2 Target for the recycling of packaging waste

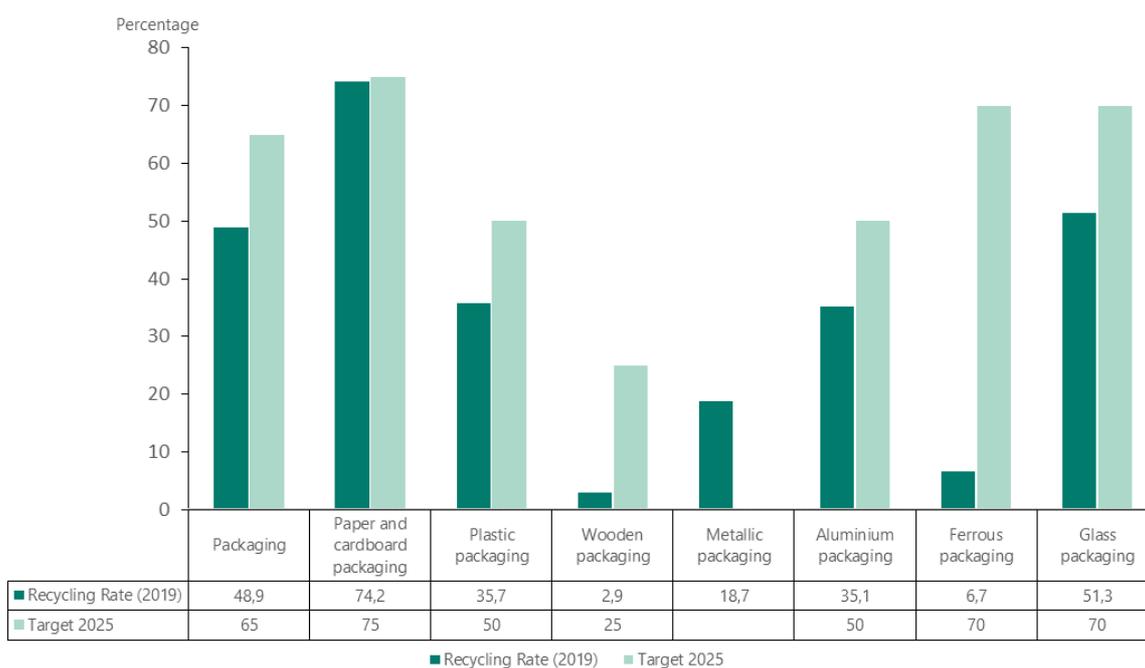
This chapter aims at assessing the prospects of the Croatia to achieve the **65 % recycling target for packaging waste** in 2025 as well as the **material specific packaging waste recycling targets** (50 % of plastic; 25 % of wood; 70 % of ferrous metals; 50 % of aluminium; 70 % of glass; 75 % of paper and cardboard). In order to conclude on this likelihood, the analysis takes stock of the status of several factors that are proven to influence the levels of recycling in a country. For a detailed description of the methodology followed, the development of success/risk factors and their impact on recycling, please consult the Methodology report (ETC/CE & ETC/WMGE, 2022).

### 2.2.1 Current situation and past trends

#### SRF P-1.1 Distance to target

The actual distance to the target for the most recent data point is a key factor determining the likelihood of meeting or not meeting the target. This analysis is based on data reported by Croatia to Eurostat in accordance with Commission Decision 2005/270/EC as last amended by the Commission Implementing Decision 2019/665 (EC, 2019a), published in the dataset *Recycling rates of packaging waste for monitoring compliance with policy targets, by type of packaging [env\_waspacr]*. The latest available data refer to 2019. The performance of Croatia for 2019 is illustrated in Figure 2.2.

Figure 2.2 Packaging recycling rates for Croatia in 2019, in percentage



Source: Eurostat (2022c), EU (2018)

Data on packaging put on the market are obtained by an EPR scheme. General estimates are not used to improve the data coverage (Eurostat, 2020). However, in the previous Early warning report by EC (2018a) it was estimated that the data on packaging put on the market (i.e. packaging waste generated) is seriously underestimated, which again leads to overestimation of the recycling rates.

For Croatia, the reported total recycling rate for packaging waste is 16.1 percentage points below the 2025 target of 65 %. The current recycling rate is driven by paper and cardboard packaging recycling,

which is the only packaging waste fraction close to the target. Croatia has reported a recycling rate of 74.2 % for paper and cardboard.

Since 2019, the reported data make a distinction between ferrous metals and aluminium, but both recycling rates are significantly lower than the recycling requirements respectively 63.3 and 14.9 percentage points below the target. Also for other packaging fractions the distance to target is high, being 14.3 percentage points, for glass the distance to target is 18.7 percentage points and for wood 22.1 percentage points.

According to the Croatian authorities, waste management operators use specific waste codes for differentiating packaging and non-packaging wastes. If packaging and non-packaging waste are mixed together, the operator estimates the share of packaging and non-packaging waste in the mixture case-specifically (Ministry of Economy and Sustainable Development, 2021). This kind of approach adds some uncertainty to the reported amounts of recycled packaging when the reports are based on estimates.

However, the recycling rates presented are based on the calculation rules of the Commission Decision 2005/270 before it was amended by the Commission Implementing Decision 2019/665 and will likely differ from the recycling rates to be reported according to the new calculation rules. The new calculation rules will only be mandatory to be used for the reference year 2020 and onwards. A key difference in the new calculation rules compared to the old rules is that the amount of sorted packaging waste that is rejected by the recycling facility shall not be included in the reported amount of recycled packaging waste.

In the questionnaire, the Croatian authorities reported that the impact of the new calculation rules on the recycling rates has not been assessed yet, but no considerable impacts are expected. The possibility to include the quantity of reusable packaging in the calculation, if applied, could positively affect the recycling rates. (Ministry of Economy and Sustainable Development, 2021)

As a matter of sensitivity analysis, to assess what the impact of these new calculation rules could be (change in calculation point), recycling losses found in literature (EXPRA, 2014) are applied to the packaging recycling rates as reported for reference year 2019:

- Paper and cardboard packaging: decrease by 10 %, from 74.2 % to 66.8 %
- Metal packaging: decrease by 14 %, from 18.7 % to 16.1 %
- Glass packaging: decrease by 5 %, from 51.3 % to 48.7 %
- Plastic packaging: decrease by 21 %<sup>1</sup>, from 35.7 % to 28.2 %
- Wooden packaging: decrease by 11 % from 2.9 % to 2.6 %
- Total packaging: calculated based on the amounts of each packaging material generated and recycled in 2019, the recycling rate would drop from 48.9 % to 43.7 %.

Taking these recycling losses rates into account the distance to target only further increases. Only for paper and cardboard packaging, the target is still attained.

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<sup>1</sup> This is the weighted recycling loss taking into account the 29 % recycling loss for packaging waste from household sources (66 %) and the 5 % recycling loss for packaging waste from commercial sources (33 %).

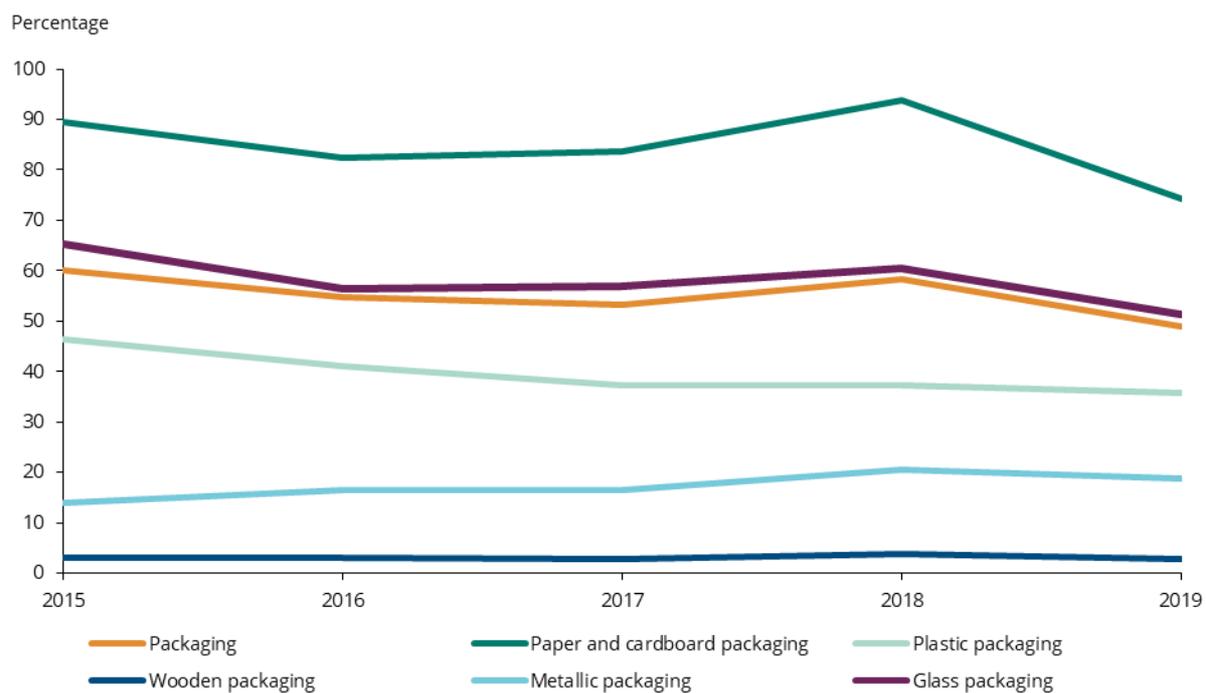
## Summary result

Total packaging	> 15 percentage points below target	Croatia reports a recycling rate of 48.9 %. If the new calculation rules would be applied (taking into account losses in the recycling plants for the different materials), the estimated recycling rate would drop to 43.7 %, 21.3 percentage points below the target.
Paper and cardboard	5 – 15 percentage points below target	Croatia already reports a higher recycling rate than the 2025 target. However, if the new calculation rules would be applied (taking into account losses in the recycling plants for the different materials), the estimated recycling rate would drop to 66.8 %, 8.2 percentage points below the target.
Ferrous metals	> 15 percentage points below target	Croatia reports a recycling rate of 6.7 %. If the new calculation rules would be applied (taking into account losses in the recycling plants for the different materials), the recycling rate would further decrease to 5.8 %, 64.2 percentage points below the 2025 recycling target for ferrous metals.
Aluminium	> 15 percentage points below target	Croatia reports a recycling rate of 35.1 %. If the new calculation rules would be applied (taking into account losses in the recycling plants for the different materials), the recycling rate would further decrease to 30.2 %, 19.8 percentage points below the 2025 recycling target for aluminium.
Glass	> 15 percentage points below target	Croatia reports a recycling rate of 51.3 %. If the new calculation rules would be applied (taking into account losses in the recycling plants for the different materials), the estimated recycling rate would drop to 48.7 %, 21.3 percentage points below the target.
Plastic	> 15 percentage points below target	Croatia reports a recycling rate of 35.7 %. If the new calculation rules would be applied (taking into account losses in the recycling plants for the different materials), the estimated recycling rate would drop to 28.2 %, 21.8 percentage points below the target.
Wood	> 15 percentage points below target	Croatia reports a recycling rate 2.9 %. If the new calculation rules would be applied (taking into account losses in the recycling plants for the different materials), the estimated recycling rate would drop to 2.6 %, 22.4 percentage points below the target.
Robustness of the underlying information		<p>The assessment is limited by the fact that the recycling rates for 2019 reported by Croatia to Eurostat do not yet reflect the new calculation rules, and the impact of the new calculation rules has therefore been estimated based on literature.</p> <p>There is an underreporting issue concerning the generated packaging waste amounts, which results in overestimated recycling rates. In addition, current coding practice for marking packaging and non-packaging wastes may cause possible uncertainty in the data. No estimates are available to assess the effect of an inclusion of the non-reported packaging placed on the market on the recycling rates.</p>

### SRF P-1.2: Past trend in Packaging Waste Recycling

The development of the historical trend in the recycling rate indicates previous efforts towards packaging waste recycling. In this analysis the recycling rate reported in the Eurostat dataset *Recycling rates of packaging waste for monitoring compliance with policy targets, by type of packaging [env\_waspacr]* (latest data year: 2019) is used. The recycling trends for packaging waste by material in Croatia are illustrated in Figure 2.3.

Figure 2.3 Trend in packaging waste recycling rates in Croatia between 2015 and 2019, in percentage



**Note:** Croatia reported separate data for aluminium and steel packaging for the first time in 2019

**Source:** Eurostat (2022c)

The overall packaging recycling rate has decreased by 18.6 percentage points during the past five years. Only during the last reporting year, the recycling rates have dropped significantly, most prominently for paper and cardboard. Croatia states that this is because the reporting on impurities and humidity at the recycling site have been improved. The recycling rate for metals has increased steadily by 34.5 percentage points. The recycling rate for the remaining packaging waste streams has been decreasing. For plastic packaging and glass packaging by 22.9 and 21.3 percentage points, respectively. The recycling of wooden packaging has been very modest in Croatia; during the period investigated, the recycling rate decreased further by 6.5 percentage points.

## Summary result

Total packaging	RR < 55% and increase in last 5 years < 10 percentage points	The recycling rate decreased by 11.2 percentage points over the past five years and is estimated at 43.7 %, if the new calculation rules would be applied (taking into account losses in the recycling plants).
Paper and cardboard packaging	RR > 65%, and increase in last 5 years < 10 percentage points	The recycling rate for paper and cardboard packaging has decreased by 15.2 percentage points since 2015, and the current recycling rate is 66.8 %. If the new calculation rules would be applied (taking into account losses in the recycling plants).
Ferrous metals packaging	RR < 60% and increase in last 5 years < 10 percentage points	The trend in recycling rate over the last five years cannot be quantified, as Croatia has only provided recycling rates for ferrous metals since 2019. The development for total metal packaging is used instead. It shows an increase by 4.8 percentage points. The current recycling rate for steel packaging is 5.8 % if the new calculation rules would be applied (taking into account losses in the recycling plants).
Aluminium packaging	RR < 40% and increase in last 5 years < 10 percentage points	The trend in recycling rate over the last five years cannot be quantified, as Croatia has only provided recycling rates for aluminium since 2019. The development for total metal packaging is used instead. It shows an increase by 4.8 percentage points. The current recycling rate for aluminium packaging is 30.2 % if the new calculation rules would be applied (taking into account losses in the recycling plant).
Glass packaging	RR < 60% and increase in last 5 years < 10 percentage points	The recycling rate decreased by 13.9 percentage points since 2015, and the current recycling rate is 48.7 % if the new calculation rules would be applied (taking into account losses in the recycling plants).
Plastics packaging	RR < 40% and increase in last 5 years < 10 percentage points	The recycling rate has decreased by 10.6 percentage points over the past five years and the recycling rate is estimated at 28.2 %, if the new calculation rules would be applied (taking into account losses in the recycling plants).
Wooden packaging	RR < 15% and increase in last 5 years < 10 percentage points	The recycling rate has decreased by 0.2 percentage points over the past five years and the recycling rate is estimated at 2.6 %, if the new calculation rules would be applied (taking into account losses in the recycling plants).
Robustness of the underlying information		<p>The assessment is limited by the fact that the recycling rates for 2019 reported by Croatia to Eurostat do not yet reflect the new calculation rules, and the impact of the new calculation rules has therefore been estimated based on literature.</p> <p>There is likely to be an underreporting issue concerning the generated packaging waste amounts, which results in overestimated recycling rates. No estimates are available to assess the effect of an inclusion of the non-reported packaging placed on the market on the recycling rates. Especially the reliability of the paper and cardboard data needs further investigation.</p>

## 2.2.2 Legal instruments

### *SRF P-2.1: Timely transposition of the revised Packaging and Packaging Waste Directive into national law*

Timely transposition of the Packaging and Packaging Waste Directive, as amended by Directive 2018/852, into national law within the foreseen period is key for a waste management system in line with EU requirements.

Croatia has transposed most of the provisions of the PPWD into the national legislation through the new Waste Management Act which was published in the Official Gazette No. 84/2021 on 23 July 2021 and entered into force on 31 July 2021. The rest of the PPWD is expected to be transposed by the first half of 2022 through a new ordinance.

### Summary result

No full transposition yet	The PPWD is not yet fully transposed into national legislation
Robustness of the underlying information	Credible information received from the European Commission (status as of 12 November 2021) and from the Croatian authorities through the EEA-ETC/WMGE questionnaire and during the review of this assessment in April 2022.

### *SRF P-2.2: Responsibilities for meeting the targets, and enforcement mechanisms, e.g. fines etc.*

Croatian authorities state that the recycling policy for packaging wastes is the responsibility of the following authorities and stakeholders (Ministry of Economy and Sustainable Development, 2021):

- Authorities:
  - The Ministry of Economy and Sustainable Development is responsible for transposition of EU legislation into national legislation and for the development and implementation of national packaging waste management policies, including meeting the prescribed packaging waste recycling targets, The Government of the Republic of Croatia is responsible for the adoption of the Regulation prescribing the amount and method of calculating of the packaging waste management fee;
  - The Financial Agency – according to the new Waste Management Act ([O.G. No. 84/2011](#)), is (on behalf and for the account of the Environmental Protection and Energy Efficiency Fund) responsible for keeping a register of producers (fee payers) who place products in packaging on the market in Croatia;
  - The Ministry of Finance – Customs Administration, on the basis of an agreement with the Environmental Protection and Energy Efficiency Fund, provides the data to the Fund concerning products in packaging put on the market in Croatia, originating from countries outside the EU;
  - The Ministry of the Interior is co-responsible, together with State Inspectorate for supervising the transport of packaging waste;
  - The Environmental Protection and Energy Efficiency Fund manages the EPR system and is responsible for the coordination and control of collection and treatment of waste under the EPR. It covers the costs of the EPR system from the fees paid by packaging producers;
  - Local and district (regional) self-government units are responsible for the conditions and implementation of municipal waste management in their area;

- State Inspectorate supervises/monitors the implementation of the Waste Management Act and regulations adopted on its basis, and is responsible for the enforcement of it.
- Stakeholders:
  - Public service providers (municipal waste collection companies) are responsible for collection of municipal waste. They are obliged to hand over packaging waste from recyclable municipal waste collected as part of public service to waste collector, and on this account they are entitled to receive compensation from the Fund;
  - Collectors and treatment operators with and without a contract with the Fund, collect and treat the packaging waste generated;
  - The producers of products in packaging (producers) pay the prescribed waste management fee to the Environmental Protection and Energy Efficiency Fund. In addition, producers are responsible to submit quantities and types of packaging put on the market to the Fund. The producers who paid the prescribed fee to the Fund have no further obligations regarding to packaging waste collection or treatment;
  - Packaging provider/manufacturer – In accordance with the best available technologies, a packaging provider shall produce reusable, recoverable and/or recyclable packaging in order to minimise adverse environmental impact of packaging and packaging waste. A packaging provider (and producer) may place on the market only packaging that meets the essential requirements relating to manufacture and composition of packaging and its adequacy for reuse and recovery, including recycling. A packaging provider may place on the market packaging made of packaging material whose sum of heavy metal concentration levels (lead, cadmium, mercury and hexavalent chromium) does not exceed 100 mg per kilogram of weight, except in the case of packaging that is entirely made of lead crystal glass in compliance with the regulation governing crystal glass products. He shall submit to the register the packaging provider's report on the type and quantity of packaging placed on the market in the Republic of Croatia. He is not obliged to pay the management fee except for the packaging in which he places his products (packaging) on the market;
  - Sellers – (Croatian Returnable fee system/Deposit refund system for beverages) A seller of beverages at a point of sale larger than 200 square metres shall accept beverage packaging waste from consumers. A seller of beverages at a point of sale smaller than 200 square metres may accept beverage packaging waste from consumers if it meets spatial and technical requirements for acceptance and safe storage of such packaging waste. A wholesaler, within the meaning of the Trade Act, that offers beverages at its point of sale shall enable the acceptance of packaging waste from its buyers, irrespective of the size of the point of sale. A seller that sells packaged products shall take packaging waste from the purchased product from the consumer free of charge at the time of purchase. For the purposes of safe transport, a seller or recycling site manager shall put the accepted beverage packaging waste in containers by type of material and hand it over to a collector sealed and marked in accordance with the Fund's instructions.
  - Recycling yard/site – is a supervised fenced yard area intended for the separate collection and preliminary storage of smaller amounts of special types of waste, including a packaging waste. It is obliged to take over packaging waste from natural persons (citizens).
  - Holder (of a packaging waste) – A natural person who possesses packaging waste shall separate it from mixed municipal waste and other kinds of waste by type of material

and dispose of it in an adequate container or recycling yard/site which is to be provided by the local authorities in the territory or hand it over to the collector (free of charge). A legal entity (person) or natural person – craftsman who possesses packaging waste shall separate it from mixed municipal waste and other kinds of waste by type of material and hand it over to the collector (free of charge).

A producer shall attain packaging waste management targets corresponding with the quantity of product packaging that the producer placed on the market by paying the management fee to the Fund (in compliance with the Ordinance and Regulation). The Fund shall take over the obligation of attaining the targets on behalf of producers who paid the mentioned prescribed fee. A producer who has not paid the prescribed fee is directly subject to inspection and misdemeanour provisions (penalties) in accordance with the Waste Management Act. A producer who places on the market products (in packaging) containing hazardous substances is not obliged to pay the management fee to the Fund, but is directly and independently responsible for the management of packaging waste from its products and meeting the objectives and goals prescribed by the Ordinance and Regulation.

The competent waste management authorities and their responsibilities are defined in the Act on Waste Management and additionally in the Ordinance on packaging and waste packaging and in the Regulation on Municipal Waste Management. (Ministry of Economy and Sustainable Development, 2021). The enforcing mechanisms in place and support mechanisms are further described in Section 2.1.2.

**Summary result**

Clearly defined responsibilities but weak/no enforcement mechanisms for meeting the recycling targets and no/weak support tools.	Responsibilities are clearly defined in the legislation. However, there seems to be no enforcement mechanism such as direct consequences for the producers if the recycling targets are not met, and no clear support mechanisms are in place. Therefore, it can be argued that the packaging waste management governance functions in a somewhat suboptimal manner.
Robustness of the underlying information	Credible information received through the EEA-ETC/WMGE questionnaire from national authorities.

**2.2.3 Economic instruments**

*SRF P-3.1: Taxes and/or ban for landfilling residual- or biodegradable waste*

Bans and taxes on landfilling of residual waste can help to discourage landfilling and thus support recycling, also of packaging waste.

As described in Section 2.1.3, Croatia has reduction targets to limit the amount of biodegradable waste deposited to landfill to a maximum of 35 % of the total landfilled waste, however, no ban applies. In addition, according to 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 May 2021) per tonne of municipal waste disposed.

In the Ordinance on waste management accepted in 2017 a waste tax to decrease landfilling was proposed (EC, 2019b), but so far the tax has not been introduced in Croatia (Ministry of Economy and Sustainable Development, 2021).

### Summary result

No landfill taxes	Croatia has no landfill tax in place, and the municipal waste charge of HRK 12 per tonne of waste disposed is very low (corresponding to around 1.6 EUR/t in 2021 and to 2.3 EUR/t rescaled based on purchasing power parities)
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

### *SRF P-3.2: Taxes on municipal waste incineration*

Taxes on incineration of residual waste can help to discourage strong reliance on residual waste treatment and thus support recycling. As described in Section 2.1.3, Croatia does not have waste incineration plants.

### Summary result

N/A (for countries without capacities for incineration)	Croatia does not have capacity for incineration.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

### *SRF P-3.3: Packaging taxes*

Packaging taxes can support the aim to reduce packaging waste generation and/or to influence the choice of packaging materials and encourage recyclability and eco-design.

According to information available, Croatia does not have taxes on packaging. The fees to be paid by packaging producers to the Environmental Protection and Energy Efficiency Fund are not considered as packaging taxes but as EPR fees.

There are currently no known and concrete data on the planned changes in fees/taxes. All the changes that are planned are still under discussion (for example an extension of the existing deposit refund system by introducing multi-layered (tetrapack) beverage packaging as well as HDPE beverage packaging, fee modulation in accordance with the Waste Framework Directive, etc.) (Ministry of Economy and Sustainable Development, 2021).

### Summary result

No packaging taxes	Croatia has management fees for different packaging materials, but no packaging taxes in place.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

### *SRF P-3.4: Pay-as-you-throw (PAYT) system in place*

As a large share of packaging waste is generated in households, incentivising households to separate packaging waste at source, e.g. by applying PAYT systems, is relevant for meeting the recycling targets for packaging waste.

As described in Section 2.1.3 in more detail, Croatia has PAYT systems in use.

## Summary result

PAYT scheme fully rolled out (to at least 80 % of the population)	Croatia has a fully rolled out PAYT system
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

### SRF P-3.5: Deposit return systems

Deposit Return Systems (DRS) generate high capture rates for packaging covered by the system and thus contribute to increased recycling rates.

The DRS in Croatia was established in 2005 to manage one-way PET, Al/Fe and glass beverage packaging. The DRS is extended to cover also milk and liquid dairy products from 1 July 2021. A payment of a returnable fee (deposit) (HRK 0.50 per packaging unit) acts as an incentive to the waste holder to deliver used beverage packaging to a seller of beverages at a point of sale larger than 200 m<sup>2</sup> or recycling site manager. The producer of the beverages charges the amount of the returnable fee from the buyer and pays the fee to the Environmental Protection and Energy Efficiency Fund, which returns the paid fees to the seller or recycling site manager. In Croatia, mandatory schemes covering all products with volume ≥ 0,2 litres exist for aluminium drink cans, glass drink bottles, and plastic PET drink bottles. No DRS are in place for wooden packaging and plastic crates. (Ministry of Economy and Sustainable Development, 2021)

## Summary result

Aluminium drink cans	Mandatory DRS for nearly all drink cans	A mandatory DRS covering all aluminium drink cans with volume equal to or exceeding 0.2 litres.
Glass drink bottles	Mandatory DRS for nearly all drink bottles	A mandatory DRS covering all glass bottles with volume equal to or exceeding 0.2 litres.
Plastic drink bottles	Mandatory DRS for nearly all drink bottles	A mandatory DRS covering all PET plastic drink bottles with volume equal to or exceeding 0.2 litres.
Plastic crates	No DRS for plastic crates	No DRS in place for plastic crates.
Wooden packaging	No DRS for wooden packaging	No DRS in place for wooden packaging.
Robustness of the underlying information		Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire. The mandatory DRS scheme for plastic bottles covers only PET bottles, but it is assumed that most of the plastic drink bottles are made of PET.

## 2.2.4 Separate collection system

### SRF P-4.1: Convenience and coverage of separate collection for different packaging waste fractions

As a large part of packaging waste comes from households, separate collection systems for households and similar sources are a key condition for achieving high recycling rates of packaging waste and for collecting recyclables at adequate quality. Generally, the more convenient and accessible these systems are for their users, the better results they can deliver. The material specific assessment considers packaging waste from both household and non-household sources. For assessing the convenience and coverage of separate collection systems for households, the same methodology is used here as described in section 2.1.4.

The separate collection system of Croatia is described in more detail in section 2.1.4, with a high service level for all packaging waste materials.

Waste management operators use specific waste codes for differentiating packaging and non-packaging wastes. If packaging and non-packaging waste are mixed together, the operator estimates the share of packaging and non-packaging waste in the mixture case-specifically. The waste collected in the EPR system that is reported to the Environmental Protection and Energy Efficiency Fund is packaging waste only. The separate collection of recyclables originating from companies is mandatory in Croatia. (Ministry of Economy and Sustainable Development, 2021)

As mentioned in Section 2.1.3, mandatory DRS covering all products with volume  $\geq 0,2$  litres exist for aluminium drink cans, glass drink bottles, and plastic PET drink bottles. The existence of these schemes affects also the convenience and coverage of separate collection.

### Summary result

Paper and cardboard packaging	<b>1. Packaging waste from households</b> A high share of the population is covered by high convenience collection services	Door-to-door separate collection and high-density bring point collection are dominating collection methods for paper and cardboard.
	<b>2. Packaging waste from non-household sources</b> Separation at source is mandatory for non-household paper and cardboard packaging waste	Separate collection is mandatory for households and non-households.
Ferrous metals packaging	<b>1. Packaging waste from households</b> A high share of the population is covered by high convenience collection services	Metals are dominantly collected at high density bring points in cities. In towns and suburbs, door-to-door co-mingled collection and high-density bring point are equally important. In rural areas door-to-door co-mingled collection is dominating.
	<b>2. Packaging waste from non-household sources</b> Separation at source is mandatory for non-household ferrous metals packaging waste	Separate collection is mandatory for households and non-households.
Aluminium packaging	<b>Packaging waste from households</b> A high share of the population is covered by high convenience collection services	Metals are dominantly collected at high density bring points in cities. In towns and suburbs, door-to-door co-mingled collection and high density bring point are equally important. In rural areas door-to-door co-mingled collection is dominating. In addition, Croatia has mandatory DRS covering all aluminium drink cans with volume equal to or exceeding 0.2 litres.

Glass packaging	<b>1. Packaging waste from households</b> A high share of the population is covered by high convenience collection services	High density bring point collection is the dominating collection method for glass waste. In addition, Croatia has mandatory DRS covering all glass drink bottles with volume equal to or exceeding 0.2 litres.
	<b>2. Packaging waste from non-household sources</b> Separation at source is mandatory for non-household glass packaging waste	Separate collection is mandatory for households and non-households.
Plastics packaging	<b>1. Packaging waste from households</b> A high share of the population is covered by high convenience collection services	Plastics are dominantly collected at high density bring points in cities. In towns and suburbs, door-to-door co-mingled collection and high-density bring point are equally important. In rural areas door-to-door co-mingled collection is dominating. In addition, Croatia has mandatory DRS covering all plastic PET drink bottles with volume equal to or exceeding 0.2 litres.
	<b>2. Packaging waste from non-household sources</b> Separation at source is mandatory for non-household plastic packaging waste	Separate collection is mandatory for households and non-households.
Wooden packaging	<b>Packaging waste from non-household sources</b> Separation at source is mandatory for non-household wooden packaging waste	Separate collection is mandatory for households and non-households.
Robustness of the underlying information		The existence of the mandatory DRS for aluminium drink cans, glass drink bottles and PET plastic drink bottles enhances the efficiency of their separate collection. However, the described convenience of the collection system contrasts with the limited performance of the system in terms of capture rates and overall recycling rate for packaging waste.

**Note:** The main source for aluminium packaging waste is drink cans from households, therefore the assessment does not consider aluminium non-household waste.

*SRF P-4.2: Firm plans to improve the convenience and coverage of separate collection for the different packaging waste fractions*

To improve the type and coverage of separate collection, concrete plans are needed. This SRF is only relevant for MS and materials that do not score 'green' in SRF P-4.1. The assessment is done on a material basis and summing up the scores of the different materials according to their average share in packaging waste<sup>2</sup>. Again, the material specific assessment considers packaging waste from both household and non-household sources.

As presented in detail in section 2.1.4, Croatia plans to strengthen the separate collection system to support increasing the recycling rates. According to the Croatian authorities, the separate collection system shall be updated in accordance with the requirements laid down in the WFD and PPWD

<sup>2</sup> Based on data from Eurostat on the share of packaging materials in total packaging generated in 2018.

(Ministry of Economy and Sustainable Development, 2021). However, no firm plans, i.e. plans with clear responsible entities and defined targets and timeline, were presented.

### Summary result

Paper and cardboard packaging	<b>1. Packaging waste from households</b> N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	Croatia has indicated intentions to further improve separate collection, but no firm plans. This SRF is not relevant to Croatia, since the coverage and convenience level for the collection of packaging waste from households is medium to high, and the separate collection for non-households is mandatory for all fractions.
	<b>2. Packaging waste from non-household sources</b> N/A (for countries already having mandatory separation at source)	
Ferrous metals packaging	<b>1. Packaging waste from households</b> N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	
	<b>2. Packaging waste from non-household sources</b> N/A (for countries already having mandatory separation at source)	
Aluminium packaging	<b>Packaging waste from households</b> N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	
Glass packaging	<b>1. Packaging waste from households</b> N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	
	<b>2. Packaging waste from non-household sources</b> N/A (for countries already having mandatory separation at source)	
Plastics packaging	<b>1. Packaging waste from households</b> N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	
	<b>2. Packaging waste from non-household sources</b> N/A (for countries already having mandatory separation at source)	
Wooden packaging	<b>Packaging waste from non-household sources</b> N/A (for countries already having mandatory separation at source)	
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.	

## 2.2.5 Extended producer responsibility (EPR) and similar schemes

### SRF P-5.1: Coverage of EPR schemes

Croatia has an EPR scheme for household and non-household packaging waste covering the costs of separate collection, waste transport and treatment. The Environmental Protection and Energy Efficiency Fund manages the EPR system. The producers of products covered by EPR pay the prescribed waste management fees to the Environmental Protection and Energy Efficiency Fund, which then covers the above-mentioned costs from these fees paid. In addition, producers are responsible to submit data on quantities and types of packaging put on the market to the Fund. The Fund is responsible for the coordination and control of collection and treatment of waste under the EPR, whereas the producers have no further commitments regarding waste collection or treatment. Currently, this is the only model in operation and the Fund is the only body to which producers should pay the fees. All packaging waste, except hazardous waste, shall be handed over to the Fund, meaning that individual solutions are not allowed for the producers. (Ministry of Economy and Sustainable Development, 2021)

#### Summary result

All main packaging fractions <sup>(3)</sup> are covered by EPR schemes, covering household and non-household packaging	Croatia has EPR schemes in place covering household, industrial and commercial packaging for all packaging fractions.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

<sup>(3)</sup> **Note:** Paper and cardboard, ferrous metals, aluminium, glass, plastic

### SRF P-5.2: Fee modulation in EPR schemes for packaging

As explained in Section 2.1.5, fee modulation (or eco-modulation) is a system with different fees for different types of packaging material and designs. The assessment is the same as described in Section 2.1.5

#### Summary result

No advanced fee modulation	There is no advanced fee modulation based on the four assessment criteria presented above.
Robustness of the underlying information	Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

### SRF P-5.3 Material specific EPR assessment

The material specific assessment is based on a combination of the coverage of the material-specific EPR schemes and the use of fee modulation for the specific packaging material. The assessment takes the different situations for different types of materials into account: Plastics packaging is the packaging material that is the most difficult to recycle out of the packaging materials targeted by the Packaging and Packaging Waste Directive. Fee modulation therefore plays a larger role for plastic packaging than for the other materials and is therefore rated differently from paper/cardboard, ferrous metals, aluminium and glass. The methodology foresees a green score for plastics packaging only if all four fee modulation assessment criteria mentioned above are met. On the other hand, wooden packaging is mainly generated by commercial and industrial sources and fee modulation is less relevant, therefore the methodology only relies on EPR schemes for wooden packaging from commercial and industrial sources.

Croatia has an EPR scheme covering both household and non-household sources and all packaging types.

There is no advanced fee-modulation in place, but the Croatian authorities report that the system of fee modulation is currently under discussion. (Ministry of Economy and Sustainable Development, 2021)

### Summary result

SRF P-5.3.1 EPR scheme for paper and cardboard packaging waste	EPR scheme covering household and non-household packaging but no fee modulation	Croatia has an EPR scheme in place covering household, industrial and commercial packaging for paper and cardboard packaging waste.
SRF P-5.3.2 EPR scheme for ferrous metals packaging waste	EPR scheme covering household and non-household packaging but no fee modulation	Croatia has an EPR scheme in place covering household, industrial and commercial packaging for ferrous metals packaging waste.
SRF P-5.3.3 EPR scheme for aluminium packaging waste	EPR scheme covering household and non-household packaging but no fee modulation	Croatia has an EPR scheme in place covering household, industrial and commercial packaging for aluminium packaging waste.
SRF P-5.3.4 EPR scheme for glass packaging waste	EPR scheme covering household and non-household packaging but no fee modulation	Croatia has an EPR scheme in place covering household, industrial and commercial packaging for glass packaging waste.
SRF P-5.3.5 EPR scheme for plastic packaging waste	EPR scheme covering household and non-household packaging but no fee modulation	Croatia has an EPR scheme in place covering household, industrial and commercial packaging for plastic packaging waste.
SRF P-5.3.6 EPR scheme for wooden packaging waste	EPR scheme covering all non-household packaging	Croatia has an EPR scheme in place covering household, industrial and commercial packaging for wood packaging waste.
Robustness of the underlying information		Credible information received from the Croatian authorities through the EEA-ETC/WMGE questionnaire.

**Note:** Plastics packaging is the most difficult to recycle packaging material out of the packaging materials targeted by the Packaging and Packaging Waste Directive. Fee modulation therefore plays a larger role for plastic packaging than for the other materials and is therefore rated differently in this table.

## 2.3 Target on landfill of municipal waste

### 2.3.1 Current situation and past trends

#### SRF LF-1.1: Distance to target

The Landfill directive (1999/31/EC), as amended by Directive (EU) 2018/850, sets a target to reduce, by 2035, the amount of municipal waste landfilled to 10 % or less of the total amount of municipal waste generated (by weight).

Data to show the current rate of landfilling in line with the reporting rules will only be reported by mid-2022. Therefore, this analysis calculates the landfilling rate based on the current Eurostat dataset *Municipal waste by waste management operations* [env\_wasmun]; by dividing the amount of landfilled waste by the total amount of waste generated. The overall landfilling rate of Croatia was 55.7 % in 2020 (Eurostat, 2022a).

#### Summary result

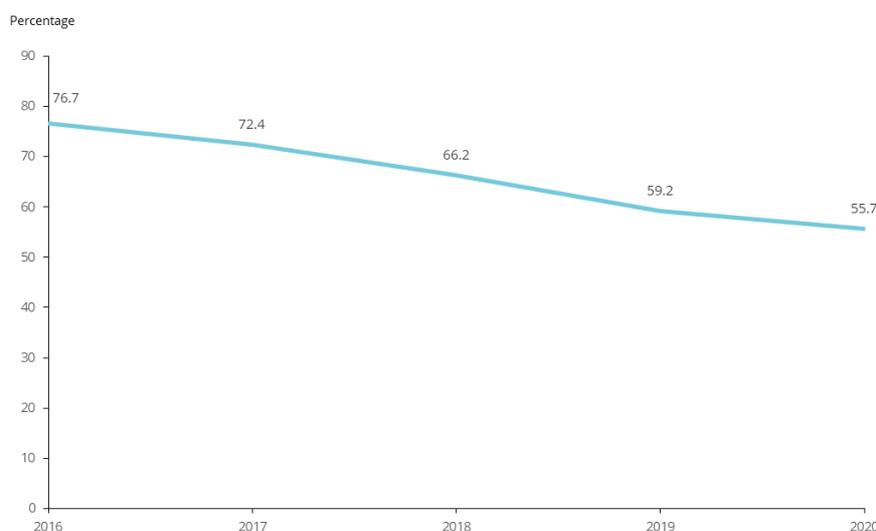
Distance to target > 20 percentage points	Croatia is 45.7 percentage points from reaching the target.
Robustness of the underlying information	The data are derived from Eurostat and are considered to be rather robust. However, the reported landfill rate might increase once the new calculation rules laid down in the Commission Implementing Decision (EU) 2019/1885 will be applied. Based on the available information, it is currently not possible to quantify the impact of the new calculation rules on the landfill rate.

#### SRF LF-1.2: Past trend in municipal solid waste landfill rate

Over the past five years, the overall landfilling rate of Croatia has decreased by 21 percentage points, from 76.7 % to 55.7 % (Figure 2.4).

Despite the good progress, the distance to target is still very big: 45.7 percentage points. To meet the target Croatia has to speed up the pace of reducing landfilling.

**Figure 2.4 Landfilling in Croatia between 2016 and 2020, in percentage**



Source: Eurostat (2022a)

### Summary result

Landfill rate in 2020 > 25% and decrease in last 5 years > 15 percentage points	The distance to target is very large (45.7 percentage points), but the decrease over the last five years has been 21 percentage points.
Robustness of the underlying information	There are no breaks in the time series data.

### *SRF LF-1.3: Diversion of biodegradable municipal waste from landfill*

According to Art. 5(2c) of the EU Landfill Directive, Member States had to ensure that by 2016, biodegradable municipal waste going to landfills is reduced to 35 % of the total amount (by weight) of biodegradable municipal waste produced in 1995 or the latest year before 1995 for which standardised Eurostat data is available. However, Croatia has negotiated a derogation from the targets: by 2016, it had to reduce biodegradable municipal waste landfilled to 50 % of the amount generated in 1997, and by 2020 to 35 %.

The amount of biodegradable municipal waste landfilled was 110 % in 2016, 106 % in 2017 and 98 % in 2018 of the total amount (by weight) of biodegradable municipal waste produced in 1997 (EC, 2021b, 2022a). The Croatian authorities report that in 2019, the amount of biodegradable municipal waste landfilled was 90 % related to the total amount (by weight) of biodegradable municipal waste produced in 1997, and 79 % in 2020 (Ministry of Economy and Sustainable Development, 2021).

### Summary result

Target for reducing the amount of biodegradable municipal waste (BMW) landfilled to 35 % of BMW generated in 1997 has not been achieved in 2016 or in the year specified in the derogation where applicable	Croatia has reported 79 % biodegradable waste landfilled in 2020 related to the generated biodegradable waste in 1997 and has not achieved the 2016 target nor is it on track to meet the 2020 target. However, the decrease over the last five years has been 31 percentage points.
Robustness of the underlying information	Information received from the Croatian authorities

### 3 Conclusion

This risk assessment indicates whether Croatia is at risk of not meeting the targets. The ‘total risk’ categorization is the result of the sum of the individual scores of each SRF as described in the previous chapter, where the assessment of each SRF results in a score of **2 points (green), 1 point (amber) or 0 points (red)**, depending on the assessment of the SRF. As some SRFs are considered to have a higher impact on meeting the target, the score of the SRF is multiplied by the defined weight of the SRF. As some SRFs might not be applicable to Croatia, only the SRFs relevant to Croatia are taken into account to define the maximum score. Croatia is considered to be ‘not at risk’ if its score is more than 50 % of this maximum score, and ‘at risk’ if its score is less than 50 % of this maximum score.

#### 3.1 Prospects for meeting the recycling target for municipal solid waste

<p><b>34 %</b> of maximum score</p>	<p>Based on the provided information and the analysis done, it is concluded that Croatia is <b>at risk for not meeting the MSW recycling target in 2025.</b></p>
<p>Current situation and past trends:</p>	<p>Based on currently available data Croatia’s recycling rate lies at 34.3 %, so the distance to the 2025 target is 20.7 percentage points below the 2025 target. Considering, however, the impact of the new calculation rules, we assume a reduction with 5 percentage points for this assessment, resulting in an estimated recycling rate of 29.3 %, 25.7 percentage points below the target.</p>
<p>Legal instruments:</p>	<p>The Waste Framework Directive has not yet been fully transposed into Croatian legislation. Responsibilities are defined in the legislation and support and enforcement mechanisms are in place but there are no recycling targets imposed on the local self-governance units (LSGU’s).</p> <p>Responsibilities are defined in the legislation and support and enforcement mechanisms are in place. There is both a fine for non-compliance and a fee for not meeting the targets for mixed waste set in the NWMP, aiming to increase separate collection.</p> <p>LSGU’s have to pay an incentive fee for residual waste exceeding certain targets, but the fee seems to be too low to be effective.</p>
<p>Economic instruments:</p>	<p>Croatia does not have a landfill tax although it has been proposed in the legislation. The municipal waste charge for waste disposed is very low and will not create an incentive for diversion of waste from landfills.</p> <p>Croatia does not have capacity for incineration and subsequently no incineration tax.</p> <p>An estimate 90 % of the population is covered by PAYT schemes, primarily based on container volume and collection frequency.</p>

<p>Separate collection systems:</p>	<p>Separate collection is not yet fully applied everywhere: 75 % of LSGU's collect paper and cardboard, glass, plastics and metals separately, while 6 % don't collect any of these separately. Separate bio-waste collection is rolled out in 40 % of LSGU's.</p> <p>The high generation of residual waste in Croatia shows that the current separate collection system does not provide an incentive for sorting and separate collection. Although the service level for separate collection is on a high level, it seems more incentives and awareness raising is needed to enable the potential of the system.</p> <p>A high share of the population is covered by high convenience collection services for paper and cardboard, metals, plastics, textiles and glass.</p> <p>A low share of the population is covered by high convenience collection services for bio-waste and wood. For WEEE, high convenience collection services dominate.</p> <p>There are no firm plans to improve the convenience and coverage for wood. There are plans to improve the type and coverage of collection for bio-waste. In addition, there are plans to support composting at home to increase the recycling of bio-waste.</p>
<p>Extended producer responsibility:</p>	<p>Croatia has an EPR scheme for all packaging materials for packaging waste from households and non-households. No advanced fee modulation is applied to provide incentives for producers to change packaging designs that enable higher recycling.</p>
<p>Bio-waste treatment capacity and quality management:</p>	<p>The current bio-waste treatment capacity in Croatia is used for the treatment of agricultural and industrial wastes. There are plans and allocated funds for increasing the treatment capacity of municipal bio-waste.</p> <p>Croatia has national standards for compost/digestate quality with voluntary application for end-of-waste status, and prescribes a quality management system.</p>

### 3.2 Prospects for meeting the recycling targets for packaging waste

<b>27 %</b> of maximum score	Based on the provided information and the analysis done, it is concluded that Croatia is <b>at risk for not meeting the 65 % recycling target for packaging waste in 2025</b>	
46 % of maximum score	Paper and cardboard	At risk
25 % of maximum score	Ferrous metals packaging	At risk
30 % of maximum score	Aluminium packaging	At risk
30 % of maximum score	Glass packaging	At risk
25 % of maximum score	Plastics packaging	At risk
27 % of maximum score	Wooden packaging	At risk
Current situation and past trends:	<p>The total packaging recycling rate (revised) is 43.7 %, 21.3 percentage points below the 2025 target.</p> <p>With the exception of paper and cardboard packaging, all waste streams are more than 15 percentage points below target.</p> <p>The total packaging recycling decreased by 11.2 percentage points over the past five years.</p>	
Legal instruments:	<p>The amended Packaging and Packaging Waste Directive has not yet been transposed into national law. Responsibilities are defined in the legislation and support and enforcement mechanisms are in place. However, there seems to be no direct consequences for the producers if the recycling targets are not met.</p>	
Economic instruments:	<p>There is no landfill tax.</p> <p>An estimated 90 % of the population is covered by PAYT schemes, primarily based on container volume and collection frequency.</p> <p>Croatia has management fees for different packaging materials, but no packaging taxes in place.</p> <p>Mandatory DRS covering all products with volume <math>\geq 0,2</math> litres for aluminium drink cans, glass drink bottles, and plastic PET drink bottles. No DRS for wooden packaging and plastic crates</p>	

<p>Separate collection systems:</p>	<p>The high generation of residual waste in Croatia shows that the current separate collection system does not provide an incentive for sorting and separate collection. Although the service level for separate collection is on a high level, it seems more incentives and awareness raising is needed to enable the potential of the system.</p> <p>There are intentions to improve the type and coverage of collections for all streams, but no firm plans.</p> <p>Separation at source is mandatory for commercial and industrial packaging waste but it is unclear how this is implemented and monitored.</p>
<p>Extended producer responsibility:</p>	<p>All main packaging fractions are covered by EPR schemes, covering household and non-household packaging, but no advanced fee modulation is implemented.</p>

### 3.3 Prospects of meeting the landfill of municipal waste target

<p><b>7 %</b> of maximum score</p>	<p>Based on the provided information and the analysis done, it is concluded that Croatia is <b>at risk for not meeting the 2035 target to reduce the amount of municipal waste landfilled to 10 % or less of the total amount of municipal waste generated.</b></p>
<p>Current situation and past trends:</p>	<p>Croatia managed to decrease the landfill rate by 21 percentage points over the past five years, but still landfills 59 % of municipal waste, 40 percentage points above the 10 % maximum target.</p>
<p>Diversion of biodegradable municipal waste from landfill:</p>	<p>Croatia has reported 79 % biodegradable waste in 2020 related to the generated biodegradable waste in 1997, and thus has not achieved the 2016 nor the 2020 target. However, the decrease over the last five years has been 31 percentage points.</p>

## List of abbreviations

<b>Abbreviation</b>	<b>Name</b>
CE	Circular economy
DRS	Deposit Return System
EC	European Commission
EEA	European Environment Agency
EPEEF	Environmental Protection and Energy Efficiency Fund
EPR	Extended producer responsibility
ETC/CE	European Topic Centre on Circular Economy and resource use
ETC/WMGE	European Topic Centre on Waste and Materials in a Green Economy
GIS	Geographic information system
LSGU	Local self-government unit
MBT	Mechanical biological treatment
MESD	Ministry of Economy and Sustainable Development
MS	Member state
MSW	Municipal solid waste
PAYT	Pay-as-you-throw
PPWD	Packaging and Packaging Waste Directive
PRO	Producer responsibility organisation
PS	Polystyrene
RR	Recycling rate
SRF	Success and risk factor
SUP	Single-use plastics
WEEE	Waste Electric and Electronic Equipment
WFD	Waste Framework Directive
WMP	Waste Management Plan

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# Annex 1 Implementation of previous early warning recommendations

In 2018, the European Commission assessed that Croatia would be at risk of not meeting the Waste Framework Directive's target to prepare for re-use and recycle at least 50 % of municipal waste, and provided a set of policy recommendations to improve the situation (EC, 2018a). This annex lists the recommendations and a self-assessment of the Croatian authorities on the status of taking them into account.

## Recommendations on data reporting

*1) Systematic audits on companies providing data on the amounts of packaging placed on the market (producers or producer responsibility organisations — PROs) to ensure that it is in line with the data on municipal waste. Reconciliation of differences between the municipal waste and packaging waste datasets.*

The Croatian authorities consider this recommendation partly implemented (Ministry of Economy and Sustainable Development, 2021), but no explanation considering the implementation of this recommendation was not given.

*2) Monitoring more closely the amounts of waste landfilled at those landfills which are still without weighbridges.*

In 2020, 24 small municipal waste landfills out of 84 municipal landfills in total, did not have weighbridges. The share of waste not weighted was only around 8 % of the total amount of municipal waste landfilled (941.285 tonnes) in the same year. The Croatian authorities consider this recommendation implemented. (Ministry of Economy and Sustainable Development, 2021)

*3) Statistically representative compositional analysis of municipal waste.*

27 public service providers covering 63 local self-government units (mostly bigger cities and towns) reported the implementation of the composition analysis, showing an improvement compared to the years 2005-2015 (34 local self-government units (LSGUs) were covered) and 2016-2020 (28 LSGUs covered). The Croatian authorities consider this recommendation partly implemented (Ministry of Economy and Sustainable Development, 2021)

## Recommendations on extended producer responsibility

*4) Improvements to the functioning of the EPR by either:*

- specifying in detail a minimum level of collection service (see action 6) that producers are required to fund for the local self-government units (LSGUs) so that there is a focus on quality collection services, including door-to-door collection wherever appropriate; or*
- restructuring the existing approach by making producers set up their own not-for-profit PRO, which would be tasked with collecting the fees from producers and distributing them to LSGUs, while ensuring these fees are not more than necessary for the service.*

*5) In both options outlined in point 4, increases to the fees paid by producers or PROs to ensure that they cover the full costs of the collection service.*

Croatia has EPR schemes for packaging, WEEE, batteries, end-of-life vehicles, waste lubricant oils, and waste tyres. The schemes in place cover the separate collection costs entirely, as well as the costs resulting from waste transport and treatment, providing adequate information to waste holders, and data collection and reporting to the EC. The producers of products covered by EPR pay the prescribed waste management fees to the Environmental Protection and Energy Efficiency Fund that covers the above-mentioned costs from the fees paid. The Fund is responsible for the coordination and control of collection and treatment of waste under the EPR, whereas the producers have no further commitments regarding to waste collection or treatment. Currently, this is the only model in operation bringing producers, distributors or sellers, waste collectors and treatment operators together, and the Fund is the only body to which producers should pay the fees. There are no non-profit PROs in Croatia at the moment. (Ministry of Economy and Sustainable Development, 2021) More detailed information on EPR scheme is described in Section 2.1.5.

The Croatian authorities consider neither of these recommendations as implemented (Ministry of Economy and Sustainable Development, 2021)

#### **Recommendations on separate collection**

*6) Development of a more prescriptive collection service standard for implementation by LSGUs to ensure a high level of recycling, emphasising door-to-door separate collection, and ensuring a more rapid spread of door-to-door service throughout Croatia.*

An obligation for door-to-door separate collection is laid down in the waste legislation (Act on sustainable waste management, and Regulation on municipal waste management. The Croatian authorities consider this recommendation implemented. (Ministry of Economy and Sustainable Development, 2021)

#### **Recommendations on regulation and incentives for local authorities**

*7) Consideration of review of fines for LSGUs that fail to meet the targets - currently the fines are too low and most likely below the costs of achieving the targets while potential increases of fines to a more punitive level over several years would be more effective.*

The topic was reviewed during the preparation of the Waste management Act. The Croatian authorities consider this recommendation implemented. (Ministry of Economy and Sustainable Development, 2021)

*8) Implementation of measures to ensure that those LSGUs that were already achieving high rates of recycling in 2015 are not penalised.*

In 2019, 20 LSGUs achieved a separate collection rate of  $\geq 44\%$  and thus were not penalised. In addition, 107 LSGUs were not penalised as they did not exceed the limit amount of residual municipal waste. The Croatian authorities consider this recommendation implemented. (Ministry of Economy and Sustainable Development, 2021)

9) *Ensuring the definition of residual waste clearly indicates that residual waste is defined as all mixed municipal waste, minus any materials which are sorted from mixed waste for recycling. This is important since the target for LSGUs is linked to the amount of residual waste generated.*

According to the Act on Sustainable Waste Management, mixed municipal waste is defined as: “waste from households and waste from shops, industry and institutions that is similar in properties and composition to household waste, from which certain materials (such as paper, glass, etc.) have not been separated by a special procedure and in the Waste Catalog marked as 20 03 01”. The collection of waste generation data is based on that definition. Based on the data on annual mixed municipal waste generation, the performance of the LSGUs in reducing the amounts compared to the reference year 2015 is being analysed. The Croatian authorities consider this recommendation implemented. (Ministry of Economy and Sustainable Development, 2021)

#### **Recommendations on pay-as-you-throw schemes**

10) *Development of guidelines with technical and organisational details with a view to speeding up the implementation of such schemes throughout the country.*

An obligation for PAYT scheme for municipal waste is laid down in the waste legislation (Act on sustainable waste management, and Regulation on municipal waste management, and also in new Waste Management Act). The Croatian authorities consider this recommendation partly implemented. (Ministry of Economy and Sustainable Development, 2021)

PAYT scheme for municipal waste has been specified in chapter 2.1.3.

#### **Recommendations on communication and awareness-raising**

11) *Development of a set of national communications materials addressed to the public for use at local level, with clear and consistent messages. These materials should be used as part of awareness-raising campaigns, in leaflets, and at civic amenity sites (green points).*

The Environmental Protection and Energy Efficiency Fund conducts informative and educational activities in accordance with the Waste Management Plan of the Republic of Croatia for 2017-2022. For example, a national campaign called “*For an even more enchanting Croatia!*” was organised by the Fund. As a part of the campaign, video and radio clips aimed at children concerning different waste related topics were published. In addition, a large number of leaflets, brochures and other campaign materials was produced, and a contest *Reciklasičari (Recyclasics)* promoting reuse was held twice. The campaign is still active in social media and has gained more than 10 000 followers. In addition, campaigns aiming at diminishing the use of plastic bags, and promoting the reduction of packaging waste and waste sorting during holidays have been organised. (Ministry of Economy and Sustainable Development, 2021)

The Ministry of Economy and Sustainable Development co-financed 91 municipalities to conduct training and information activities on sustainable waste management with HRK 53.6 million through the Operational Program Competitiveness and Cohesion 2014-2020. (Ministry of Economy and Sustainable Development, 2021)

The Croatian authorities consider this recommendation implemented. (Ministry of Economy and Sustainable Development, 2021)

#### **Recommendations on technical support to municipalities**

12) *Development of a system at national level that provides technical support for municipalities, specifically in the following areas:*

- a. choosing collection services;*
- b. service procurement;*
- c. service management;*
- d. communication campaigns;*

*coupled with active sharing of good ideas and practices that can improve efficiency in terms of cost reduction and improvement in performance.*

An online (e-mail) service that provides quick answers for municipalities concerning the waste management issues has been introduced by the Ministry of Economy and Sustainable Development. In the Act on sustainable waste management regulation concerning the choosing of collection services, service procurement and service management are given. The Croatian authorities consider this recommendation partly implemented. (Ministry of Economy and Sustainable Development, 2021)

Pursuant to the provisions of Article 26, paragraph 10 of the Sustainable Waste Management Act (Official Gazette 94/13, 73/17, 14/19, 98/19) and Article 21a of the Ordinance on the methods and conditions for the landfill of waste, categories and operational requirements for waste landfills (Official Gazette 114/15, 103/18, 56/19), the Ministry issued a Decision on the order and dynamics of landfill closure (OG 3/19 and 17/19) which contains the *Dynamics on the closure of non-hazardous waste landfills in the Republic of Croatia*.

The Waste Management Plan of the Republic of Croatia (RH) for the period 2017 to 2022 (Official Gazette 3/17) (Plan) determines and directs waste management in Croatia. Based on the analysis of the current situation and the waste management objectives, measures are determined to improve the procedures for preparing for reuse, recycling and other procedures for recovery and disposal of waste.

In the chapter 7.4 of the Plan - *Measures for remediation of polluted locations*, measures that need to be implemented to achieve Objective 4. - *Remediation of waste contaminated sites*, are determined. Measure 4.1 - *Creating a Plan for closing non-hazardous waste landfills* has been determined, within which it is necessary to develop the *Dynamics* of non-hazardous waste landfill closure for each county based on existing available capacities and other relevant criteria, and which should include further landfilling after 31.12.2018 at compliant landfills.

By the Decision on the implementation of the Plan for the period 2017-2022 the necessary activities of the program / project, holders, sources of financing, performance indicators and deadlines for the implementation of measures determined by the *Dynamics* have been additionally elaborated. In this way, faster implementation and monitoring of the *Dynamics* of non-hazardous waste landfill closure at the local, regional and national level is ensured, as well as better use of EU funds provided for the implementation of waste management measures.

In accordance with the given guidelines, the *Dynamics* in question aims to determine the order of closure of non-hazardous waste landfills by counties based on certain criteria, which will result in the closure of non-compliant landfills and harmonization of non-hazardous waste landfills until the opening of the waste management centres. In the first part, *Dynamics* systematically and thoroughly presented the condition in which the existing active landfills for non-hazardous waste are. Then,

methodologically, based on the presented criteria, the priorities in remediation and closure of these landfills were analysed.

### Recommendations on use of EU funds

*13) Review of spending priorities / fund allocation from EU funds to align the relevant operational programme for cohesion policy funds with the 2017 national waste management plan and waste prevention programme. Current allocation remains too heavily focused on residual waste treatment infrastructure to be provided at the regional waste management centres instead of support for separate collection of dry recyclables and of bio-waste.*

*14) Prioritising funding of ‘whole system’ changes while avoiding funding of ad hoc projects - ensuring a more structural approach that improves the whole system, rather than just some components of a good system.*

*15) Awarding funding on the condition that the LSGUs commit to implementing high quality collection services in line with the minimum service standards (see action 6), so that the funding is oriented towards delivering results and sub-standard and underperforming systems do not get funded.*

Under the Operational Programme Cohesion and Competitiveness 2014-2020, the Ministry of Economy and Sustainable Development has approved EU funding for waste management centre projects, as well as EUR 507 million for 513 different projects on waste, separate collection and recycling. Almost two third of these projects have been finalised successfully, including more than 120 civic amenity sites, 90 awareness-raising projects for citizens, more than 1 million of bins and containers for separately collected waste distributed to 408 LSGUs while the rest of the projects should be completed at latest by 2023. The Croatian authorities also state that they consider all these projects, also the waste management centres, as integral parts of the “whole system”, and consider these recommendations implemented. (Ministry of Economy and Sustainable Development, 2021)

### Recommendations on regional approach to waste management

*16) Consideration of a regional approach to achieving the targets. Differences in their current performance (due to geography, tourism) suggest the regions may require quite specific operational considerations to be taken into account to improve waste management.*

Topic shall be reviewed during the preparation of the new national waste management plan. The Croatian authorities consider this recommendation implemented. (Ministry of Economy and Sustainable Development, 2021)

The new Waste Management Act (OG No. 84/2011) provides for waste management planning at the regional (county) level. According to this Act the regional self-government unit and the City of Zagreb are obliged to adopt the *Waste management Plan of the regional self-government unit i.e. the City of Zagreb* by 1 January 2024 and make it public. The evaluation of the Plan should be done at least once in 6 years, while the Plan should be amended as needed.

The Plan should contain:

- Analysis and assessment of the situation and needs in waste management in the area of the regional self-government unit, i.e. the City of Zagreb, including the achievement of the targets prescribed by Waste Act
- Data on existing and planned buildings and devices for waste management and the status of remediation of landfills and sites contaminated with waste
- Data on the locations of discarded waste and their removal

- Data on the type and quantities of the waste generated, the waste collected separately, on the landfilling of municipal and biodegradable waste and on the state of compliance with the targets,
  - Measures necessary to comply with the waste minimization or waste prevention targets, including educational and information activities and waste collection actions,
  - List of projects important for the implementation of the Plan
- Organizational aspects, sources and amount of financial resources for the implementation of waste management measures
- Deadlines and persons responsible for the execution of the Plan
  - Measures for the collection of mixed municipal waste and biodegradable municipal waste
  - Measures for a separate collection of hazardous municipal waste, waste paper and cardboard, metal, glass, plastic and bulky municipal waste.

## **Annex 2 Detailed scoring of success and risk factors**

# Assessment sheet - Recycling target for municipal waste

MS Croatia

Date Jun-22

SRF		Assessment result	Weight	Score
<b>Current situation and past trends</b>				
MSWR-1.1	Distance to target	Distance to target > 15 percentage points or no data reported	5	0
MSWR-1.2	Past trends in municipal solid waste recycling rate	RR > 50% and increase in last 5 years < 5 percentage points, or RR > 45%, and increase in last 5 years < 10 percentage points, or RR < 45% and increase in last 5 years > 10 percentage points	1	1
<b>Legal instruments</b>				
MSWR-2.1	Timely transposition of the revised WFD into national law	Transposition with delay of > 12 months, or no full transposition yet	1	0
MSWR-2.2	Clearly defined responsibilities for meeting the targets and support and enforcement mechanisms	Clearly defined responsibilities, enforcement and good set of support mechanisms for meeting the recycling targets	1	2
<b>Economic instruments</b>				
MSWR-3.1	Taxes and/or ban for landfilling residual or biodegradable waste	No landfill taxes or low tax (< 30 EUR/t*)	1	0
MSWR-3.2	Taxes on municipal waste incineration	N/A (for countries without capacities for incineration)	1	0
MSWR-3.3	Pay-as-you-throw (PAYT) system	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	1	2

Separate collection systems				
MSWR-4.1	Convenience and coverage of separate collection systems for the different household waste fractions			
	Paper and cardboard	A high share of the population is covered by high convenience collection services	0.46	0.92
	Metals	A high share of the population is covered by high convenience collection services	0.08	0.16
	Plastics	A high share of the population is covered by high convenience collection services	0.28	0.56
	Glass	A high share of the population is covered by high convenience collection services	0.18	0.36
	Bio-waste	A low share of the population is covered by high convenience collection services	0.84	0
	Wood	A low share of the population is covered by high convenience collection services	0.06	0
	Textiles	A high share of the population is covered by high convenience collection services	0.06	0.12
	WEEE	High to medium convenience collection services dominate	0.04	0.08
MSWR-4.2	Firm plans to improve the convenience and coverage of separate collection systems for the different household waste fractions			
	Paper and cardboard	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	0.23	0
	Metals	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	0.04	0
	Plastics	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	0.14	0
	Glass	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	0.09	0
	Bio-waste	There are plans to improve the collection service but unclear plan for implementation	0.42	0.42
	Wood	No firm plans to improve the convenience and coverage	0.03	0
	Textiles	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	0.03	0
	WEEE	N/A (for countries where high to medium convenience collection services dominate already)	0.02	0

Extended producer responsibility (EPR) and similar schemes				
MSWR-5.1	Fee modulation in EPR schemes for packaging	No advanced fee modulation OR fee modulation meets less than two assessment criteria	1	0
Bio-waste treatment capacity and quality management				
MSWR-6.1	Capacity for the treatment of bio-waste	Bio-waste capacity below 80% of generated municipal bio-waste but firm plans to close the gap	1	1
MSWR-6.2	Legally binding national standards and Quality Management System for compost/digestate	Legally binding national standards for compost/digestate quality in place, and quality management system in place	1	2
			<b>Total score</b>	<b>10.62</b>
			Maximum score	30.90

34%

# Assessment sheet - Recycling target for packaging waste

MS Croatia  
Date

Jun-22

SRF		Assessment result	Weight	Score
<b>Current situation and past trends</b>				
P-1.1	Distance to target - Overall packaging	> 15 percentage points below target, or no data reported	5	0
	Distance to target - Paper and cardboard packaging	5 - 15 percentage points below target	5	5
	Distance to target - Ferrous metals packaging	> 15 percentage points below target, or no data reported	5	0
	Distance to target - Aluminium packaging	> 15 percentage points below target, or no data reported	5	0
	Distance to target - Glass packaging	> 15 percentage points below target, or no data reported	5	0
	Distance to target - Plastics packaging	> 15 percentage points below target, or no data reported	5	0
	Distance to target - Wooden packaging	> 15 percentage points below target, or no data reported	5	0
P-1.2	Past trends in packaging waste recycling rate	RR < 55% and increase in last 5 years < 10 percentage points	1	0
	Past trends in paper and cardboard packaging recycling	RR > 70% and increase in last 5 years < 5 percentage points, or RR > 65%, and increase in last 5 years < 10 percentage points, or RR < 65% and increase in last 5 years > 10 percentage points	1	1
	Past trends in ferrous metals packaging recycling	RR < 60% and increase in last 5 years < 10 percentage points	1	0
	Past trends in aluminium packaging recycling	RR < 40% and increase in last 5 years < 10 percentage points	1	0
	Past trends in glass packaging recycling	RR < 60% and increase in last 5 years < 10 percentage points	1	0

	Past trends in plastic packaging recycling	RR < 40% and increase in last 5 years < 10 percentage points	1	0
	Past trends in wooden packaging recycling	RR < 15% and increase in last 5 years < 10 percentage points	1	0
<b>Legal instruments</b>				
P-2.1	Timely transposition of the revised Packaging and Packaging Waste Directive into national law	Transposition with delay of > 12 months, or no full transposition yet	1	0
P-2.2	Clearly defined responsibilities for meeting the targets and support and enforcement mechanisms	Unclear responsibilities and weak/no enforcement mechanisms for meeting the recycling targets, but good set of support tools. OR Unclear responsibilities and no/weak support tools for meeting the recycling targets, but clearly defined enforcement mechanisms. OR Clearly defined responsibilities but weak/no enforcement mechanisms for meeting the recycling targets, and no/weak support tools. OR Unclear responsibilities, weak/no enforcement mechanisms and lack of support tools for meeting the recycling targets.	1	0
<b>Economic instruments</b>				
P-3.1	Taxes and/or ban for landfilling residual or biodegradable waste	No landfill taxes or low tax (< 30 EUR/t*)	1	0
P-3.2	Taxes on municipal waste incineration	N/A (for countries without capacities for incineration)	1	0
P-3.3	Packaging taxes	No packaging taxes	1	0
P-3.4	Pay-as-you-throw (PAYT) system	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	1	2
P-3.5	Deposit-return systems for aluminium drink cans	Mandatory DRS for nearly all drink cans	1	2
	Deposit-return systems for glass drink bottles	Mandatory DRS for nearly all drink bottles	1	2
	Deposit-return systems plastic drink bottles	Mandatory DRS for nearly all drink bottles	1	2
	Deposit-return systems for plastic crates	No or voluntary DRS for some plastic crates	1	0
	Deposit-return systems for wooden packaging	No or voluntary DRS for some wooden packaging	1	0

Separate collection systems				
P-4.1	Convenience and coverage of separate collection systems for the different packaging waste fractions			
	Paper and cardboard packaging (household)	A high share of the population is covered by high convenience collection services	1	2
	Paper and cardboard packaging (non-household)	Separation at source is mandatory for non-household paper and cardboard packaging waste	1	2
	Ferrous metals packaging (household)	A high share of the population is covered by high convenience collection services	1	2
	Ferrous metals packaging (non-household)	Separation at source is mandatory for non-household ferrous metals packaging waste	1	2
	Aluminium packaging	A high share of the population is covered by high convenience collection services	2	4
	Glass packaging (household)	A high share of population is covered by high convenience collection services	1	2
	Glass packaging (non-household)	Separation at source is mandatory for non-household glass packaging waste	1	2
	Plastics packaging (household)	A high share of the population is covered by high convenience collection services	1	2
	Plastics packaging (non-household)	Separation at source is mandatory for non-household plastic packaging waste	1	2
	Wooden packaging	Separation at source is mandatory for non-household wooden packaging waste	2	4
P-4.2	Firm plans to improve the convenience and coverage of separate collection systems for the different packaging waste fractions			
	Paper and cardboard (household)	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	0.5	0
	Paper and cardboard (non-household)	N/A (for countries already having mandatory sorting at source)	0.5	0
	Ferrous metals packaging (household)	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	0.5	0
	Ferrous metals packaging (non-household)	N/A (for countries already having mandatory sorting at source)	0.5	0
	Aluminium packaging	N/A (for countries in which a high share of the population is already covered by high convenience collection services)	1	0
	Glass packaging (household)	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	0.5	0
	Glass packaging (non-household)	N/A (for countries already having mandatory sorting at source)	0.5	0

	Plastics packaging (household)	N/A (for countries in which a very high share of the population is already covered by high convenience collection services)	0.5	0
	Plastics packaging (non-household)	N/A (for countries already having mandatory sorting at source)	0.5	0
	Wooden packaging	N/A (for countries already having mandatory sorting at source)	1	0
<b>Extended producer responsibility (EPR) and similar schemes</b>				
P-5.1	Coverage of EPR schemes	All main packaging fractions* are covered by EPR schemes, covering household and non-household packaging	1	2
P-5.2	Fee modulation in EPR schemes for packaging	No fee modulation OR fee modulation meets less than two assessment criteria	1	0
P-5.3	Material specific EPR assessment - Paper and cardboard packaging waste	EPR scheme covering household and non-household packaging	1	1
	Material specific EPR assessment - Ferrous metals packaging waste	EPR scheme covering household and non-household packaging	1	1
	Material specific EPR assessment - Aluminium packaging waste	EPR scheme covering household and non-household packaging	1	1
	Material specific EPR assessment - Glass packaging waste	EPR scheme covering household and non-household packaging	1	1
	Material specific EPR assessment - Plastics packaging waste	No EPR scheme or EPR scheme covering only household, industrial OR commercial packaging OR EPR scheme but without fee modulation	1	0
	Material specific EPR assessment - Wooden packaging waste	EPR scheme covering all non-household packaging	1	2
<b>Total packaging recycling target</b>				<b>8.00</b>
				Maximum score 30.00

27%

**Paper and cardboard recycling target**

<b>Total score</b>	<b>13.00</b>
Maximum score	28.00

46%

**Ferrous metals packaging recycling target**

<b>Total score</b>	<b>7.00</b>
Maximum score	28.00

25%

**Aluminium packaging recycling target**

	<b>Total score</b>	<b>9.00</b>
	Maximum score	30.00
		30%

**Glass packaging recycling target**

	<b>Total score</b>	<b>9.00</b>
	Maximum score	30.00
		30%

**Plastics packaging recycling target**

	<b>Total score</b>	<b>8.00</b>
	Maximum score	32.00
		25%

**Wooden packaging recycling target**

	<b>Total score</b>	<b>8.00</b>
	Maximum score	30.00
		27%

# Assessment sheet - Target for landfilling of municipal waste

MS Croatia

Date

Jun-22

SRF		Assessment result	Weight	Score
<b>Current situation and past trends</b>				
LF-1.1	Distance to target	Distance to target > 20 percentage points, or no data reported	5	0
LF-1.2	Past trends in municipal solid waste landfill rat	Landfill rate in 2020 < 20% and decrease in last 5 years < 5 percentage points, or Landfill rate in 2020 < 25%, and decrease in last 5 years < 10 percentage points, or Landfill rate in 2020 > 25% and decrease in last 5 years > 15 percentage points	1	1
LF-1.3	Diversion of biodegradable municipal waste from landfill	Target for reducing the amount of biodegradable municipal waste (BMW) landfilled to 35% of BMW generated in 1995 has not been achieved in 2016 or in the year specified in the derogation where applicable, or data not reported. Or in case of derogation: Target for reducing the amount of biodegradable municipal waste (BMW) landfilled to 35% of BMW generated in 1995 has not been achieved yet and available data indicate that it is unlikely to be achieved	1	0
<b>Total score</b>			<b>1.00</b>	
Maximum score			14.00	

7%