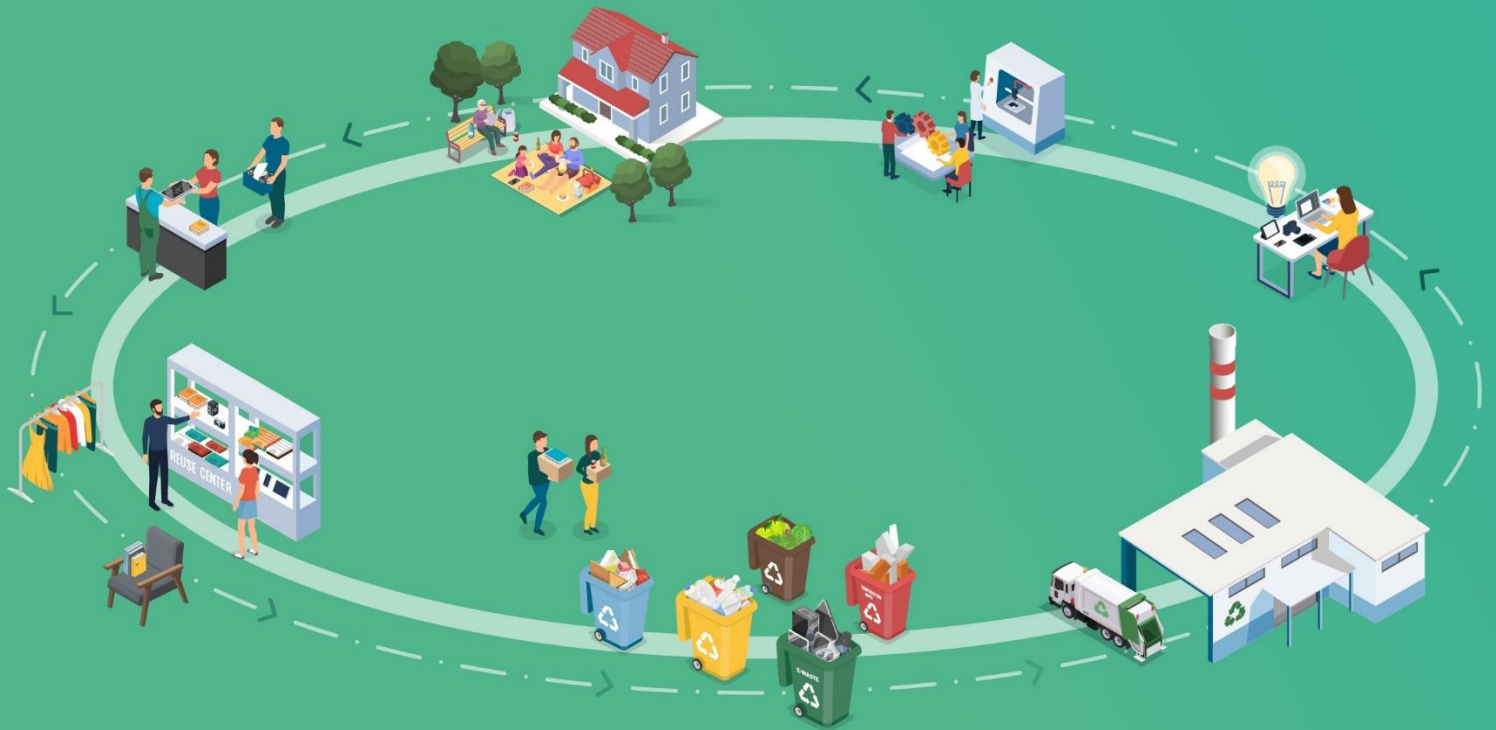


RAS Croatia (P173141)

Circular Economy Approaches in Solid Waste Management

Final Report – Summary Recommendations



CIRCULAR ECONOMY APPROACHES IN SOLID WASTE MANAGEMENT

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List of Abbreviations

CDW	Construction and Demolition Waste
CE	Circular Economy
CEAP	Circular Economy Action Plan
CEC	Circular Economy Committee
CO₂e	CO ₂ equivalents
DMC	Domestic Material Consumption
EU	European Union
FZOEU	Environmental Protection and Energy Efficiency Fund
HGK	Croatian Chamber of Economy
HRK	Croatian Kuna
IFI	International Financial Institution
JLR	Regional Administration
JLS	Local Government
KPI	Key Performance Indicator
MFA	Material Flow Analysis
MoESD	Ministry of Economy and Sustainable Development
MPGI	Ministry of Physical Planning, Construction, and State Assets
MSTI	Ministry of the Sea, Transport and Infrastructure
NWMP	National Waste Management Plan
NWMP ID	National Waste Management Plan Implementing Decision
RAS	Reimbursable Advisory Service
RME	Raw Material Equivalents
SWM	Solid Waste Management
WFD	Waste Framework Directive

Executive Summary

This report is the final report of a World Bank Reimbursable Advisory Service (RAS)¹ provided to the Government of Croatia on “Circular Economy Approaches in Solid Waste Management”. Financed by the European Union’s (EU’s) Cohesion Fund and conducted between September 2020 and November 2022, the RAS’ key objective was to improve solid waste management (SWM) and to support the transition to a more circular economy in Croatia. In particular, the RAS aimed to assist Croatia in meeting EU waste targets and in incorporating circular economy (CE) approaches into the current National Waste Management Plan (NWMP) 2017-2022 as well as the future NWMP 2023-2028, which is under development. Five key deliverables were developed in the context of this RAS: i) CE Diagnostic Study Report, ii) Report on Support for the Formulation of a Sector Specific CE Action Plan, iii) Report on Inputs to National Waste Management and Implementation Decision Revision, iv) Communication Plan, and v) Report on Summary of Capacity Building Programs. This report presents the main findings and recommendations of these key deliverables and draws conclusions for the way forward.

Croatia has been lagging the other European Union member states in transitioning towards a Circular Economy. The Croatian economy is only 2.7 percent circular - leaving a circularity gap of 97.3 percent. This compares to a circularity rate of the EU as a bloc of 12.8 percent.² Croatia still relies strongly on landfilling and failed to bring all existing landfills into compliance with the EU Landfill Directive deadline of 31 December 2018. Over the past five years, progress in separate collection and recycling of waste was made, however, the total recycling rate for 2021 has been 31.4 percent, still significantly below the EU 2020 target of reusing and recycling 50 percent of municipal waste. Furthermore, if a similar pace continues Croatia is at risk of reaching EU targets for the coming years, including increasing the share of reuse and recycling of municipal waste to 55 percent by 2025 and to 60 percent by 2030, and reducing the share of municipal waste landfilled to less than 10 percent by 2030. The largest shares of waste in Croatia are generated by the construction sector (24 percent), households (20 percent), waste and water services (16 percent), and the mining and quarrying sector (12 percent) - together accounting for almost 72 percent of all waste in Croatia.

Having realized the need for moving towards a CE, the Government of Croatia requested World Bank support through this RAS. There is a recognized urgency of meeting EU CE targets, which Croatia lags in, and incorporating CE approaches into the current National Waste Management Plan (NWMP) 2017-2022 as well as into the future NWMP for the period 2023-2028. In this context, the Ministry of Economy and Sustainable Development (MoESD) requested World Bank support for this RAS in 2020 to aid in implementing CE approaches in SWM. Its aim was to support the Croatian Government’s efforts to fill gaps in the strategic planning and policy framework in view of improving SWM and accelerating the transition to a more circular economy.

The methodology developed and applied to the RAS rests on two components: CE analysis and capacity building. Under component 1, the CE analysis focused a diagnostic analysis of the Croatian economy, aimed at understanding the current state of fostering the circular economy in Croatia and to prioritize a sector that can benefit from the development of a CE Action Plan. The CE analysis also provided an analysis of Croatia’s current waste legislation in view of proposing concrete measures to strengthen CE approaches in the current and future NWMPs. Under component 2, capacity building activities focused on national stakeholder engagement, including stakeholder mapping and establishment of a national CE Committee as the main vehicle to coordinate CE policies in Croatia. Also in this component, numerous trainings, webinars

¹ A RAS is a customized advisory and analytic service offered by the World Bank to its member countries. RASs support client countries to design or implement better policies, strengthen institutions, build capacity, and inform development strategies or operations.

² While different methodologies have been used to calculate the Croatia and EU figures, they are still representative of the circularity gap between the two.

and study tours were organized in order to enable Croatian stakeholders to speed up progress towards a CE in Croatia.

The existing policy and regulatory framework for waste management in Croatia is increasingly aligned with the EU waste framework directives, and there needs to be greater focus on implementation. The main waste strategic policy documents that set the framework for Croatia’s CE transition include the Waste Management Strategy, and the NWMP 2017-2022 with its Implementing Decision. Furthermore, Croatia has a new Waste Management Act and is in the process of developing a new NWMP for the period 2023-2028, that this RAS has provided inputs to. However, the implementation progress of the existing NWMP has shown that there is still some way to go for Croatia in timely implementation. During this RAS, it has become clear that Government of Croatia is willing to engage with stakeholders at the technical level and drive the CE agenda forward so that strengthen implementation. There is a need to streamline internal processes and procedures and be in progressive in addressing Croatia’s waste management problems (e.g., by adopting economic instruments, such as ‘landfill tax’ which has been under discussion for a few years).

To address the circularity gap in Croatia effectively, the analysis undertaken for this RAS identified four priority sectors, from which the MoESD chose construction and demolition waste (CDW) as the priority sector for future action. Following a quantitative and qualitative prioritization exercise, four sectors were proposed for priority action, including food, construction, plastics (including plastics packaging), and textile. From these sectors, the MoESD chose CDW as the priority sector for the development of a Circular Economy Action Plan (CEAP). The decision of the ministry was based on economic, environmental, institutional and practical considerations. Most significantly, this decision was influenced by the urgency for action in the wake of two earthquakes in 2020 and the related surge in CDW, which raised public interest in CDW management activities, and showed that CDW management infrastructure needs urgent development and new investments.

The proposed CEAP for the CDW sector lays out the first sectoral roadmap for putting the CE agenda into practice, developed with participation of all relevant stakeholders. It aims to illustrate the sector-specific challenges that Croatia is facing in realizing CE in the CDW sector and to recommend potential measures and actions that may help the Croatian CDW sector to transition to a more circular economy. It presents the six major challenges in the sector and the corresponding objectives and proposes best available measures and actions for the CE transition in Croatia, based on stocktaking of international good practices and policy examples. To overcome the numerous challenges and complement the NWMP being developed by Croatia, 20 operational measures and 47 concrete actions are presented along with the authority responsible for implementation, and the key performance indicator (KPI), plus timeframe for implementation and an estimated budget. The 20 proposed operational measures are presented in table ES1 below.

Table ES1: Suggested Objectives and Measures of the proposed Circular Economy Action Plan for the Construction and Demolition Waste Sector

Objective	Measure
OBJECTIVE 1: Increased cooperation among CDW stakeholders	M.1.1. Enhance dialogue and cooperation among CDW stakeholders
	M.1.2. Enhance education and support for research, innovation, and development
OBJECTIVE 2: Improved availability and quality of CDW data	M.2.1. Implement educational and informative activities related to CDW reporting
	M.2.2. Improve CDW management information system applications
	M.2.3. Improve availability and quality of CDW management data before and during operating sites
	M.2.4. Implement pre-demolition audit for construction sites
OBJECTIVE 3: Reduced illegal CDW dumping	M.3.1. Increase education of relevant bodies involved in CDW management inspection processes

Objective	Measure
	M.3.2. Strengthen regulation and controls to reduce illegal dumping of CDW
	M.3.3. Remove CDW from illegal dumpsites
OBJECTIVE 4: Increased effectiveness and efficiency in the CDW management including its recovery	M.4.1. Improve EoW status legislation for CDW
	M.4.2. Improve hazardous waste removal and asbestos disposal system
	M.4.3. Construct and equip recycling yards for construction and demolition waste "Type A"
	M.4.4. Construct and equip recycling yards for construction and demolition waste "Type B" for processing CDW
	M.4.5. Build and equip facilities for CDW analysis and quality control
OBJECTIVE 5: Stimulated growth of a green market in construction materials	M.5.1. Improve the existing application to develop a CDW Exchange
	M.5.2. Create guidelines on Green Public Procurement (GPP)
OBJECTIVE 6: Reduced generation of CDW	M.6.1. Develop guidelines for the reuse of building components, conversion, and renovation of buildings
	M.6.2. Enhance take-back systems in CDW to increase reused and recycled content
	M.6.3. Implement educational and informative activities on eco-design in public and private buildings
	M.6.4. Develop guidelines for sharing, conversion and renovation of buildings

A prioritization of actions based on impact factors and the level of legislative changes required shows that creating greater collaboration between public and private stakeholders is one of the most important and immediate elements of the CEAP. The forty-seven proposed actions were indexed with the help of an impact factor calculated based on five criteria: environmental impact; technical and economic feasibility; alignment with regulation and policies; scalability; and stakeholders' interest. While greater collaboration between public and private stakeholders was ranked highest, many actions have similar impact factors due to linkages and temporal coordination between them. In addition, the implementation of some actions will require amendments to existing legislation and a revision of the mandates and competences of involved entities, all of which require additional time. For this reason, the proposed measures and actions have also been classified according to their applicability within the existing legislative framework and considering the current mandate of the implementing bodies. However, it is important to underline that only through the full implementation of the CEAP will a complete transformation of the CDW value chain into a circular economy model be made.

The development of the proposed CEAP demonstrated the strong interest from, and engagement of all stakeholders, while highlighting the need for capacity building. The demand for action on CE in the CDW sector is high from all the stakeholders, and they are willing to contribute to finding solutions. During the course of the RAS the stakeholder engagement involved four meetings of the CE Committee (established under this RAS), six in person trainings, three webinars and two study trips. The demand for capacity building was evident in the participation of more than 100 participants in the meetings and webinars organized for sharing knowledge and international experiences. All the material developed for this purpose has been made publicly available by the MoESD along with other deliverables from this RAS. Furthermore, the extensive use of social media demonstrated its versatility for raising awareness.

The deliverables of this RAS are intended to provide inputs to the National Waste Management Plan (NWMP) 2023-2028 that is currently being prepared, and which will require significant financing for implementation. The CEAP for CDW developed under this RAS could be mainstreamed in the new NWMP, and its implementation can help cement the Government's commitment to the CE agenda and signal further alignment with the EU directives and EU CEAP. The cost of CEAP has been estimated at EUR 120

million over 2023-2027. While sources of financing for implementation in waste management are typically limited to the government budget, the energy and environment fund under the MoESD, and the EU, there may be a need for other external sources to be considered to fill the financing gap.

The RAS has also helped create the first ever CE Committee in Croatia, a multistakeholder mechanism to drive the CE agenda forward in Croatia. The CE Committee can serve as collaboration mechanism that can continue to guide the further development of the CE agenda in Croatia. The Government can consider formalizing its role and providing the CE Committee with tools and support to execute its role more efficiently and effectively. The RAS developed the Terms of Reference for an IT enabled digital platform that could be developed as an aide for the CE Committee to further communication and collaboration.

Future work potentially emanating from this RAS includes the development of further CEAPs for other priority sectors, as well as the integration of CE principles into MSW management in coastal regions. A robust methodology for developing CEAPs has been developed under this RAS, which can be applied to other sectors. Plastics, which has been identified as a priority sector under this RAS, could be selected for the development of the next sectoral CEAP, given its importance in marine litter that can lead to adverse impacts on marine ecosystems and the tourism sector – a sector of vital importance to the Croatian economy. In addition to expanding the sectoral focus, future work potentially emanating from this RAS could also provide a more regional focus, for example, by integrating CE principles into MSW management in coastal regions. This will help address the substantial strain on local waste management systems caused by tourist peaks in summer.

1. Introduction

1. This report is the final report of a World Bank Reimbursable Advisory Service (RAS)³ aimed at improving solid waste management (SWM) and supporting the transition to a more circular economy (CE) in Croatia. This RAS, entitled “Croatia: Circular Economy Approaches in Solid Waste Management”, had the objective to improve SWM and to support the transition to a more circular economy in Croatia, in particular by informing the incorporation of CE approaches in the revision of the current National Waste Management Plan (NWMP) 2017-2022 as well as the development of the future NWMP 2023-2028. It has been financed from the European Union’s (EU’s) Cohesion Fund and was conducted between September 2020 and November 2022. Five key deliverables were developed in the context of this RAS: i) CE Diagnostic Study Report, ii) Report on Support for the Formulation of a Sector Specific CE Action Plan, iii) Report on Inputs to National Waste Management and Implementation Decision Revision, iv) Communication Plan, and v) Report on Summary of Capacity Building Programs. The duration and interrelations of these deliverables are graphically shown in [Annex 1](#), which also contains links to all resources and outputs produced during this RAS. This report presents the main findings and recommendations of the key deliverables and draws conclusions for the way forward.

2. The Circular Economy is a sustainable alternative to the traditional linear (take-make-dispose) economic model. A CE aims to decouple economic activity from the consumption of finite resources, by i) eliminating waste and pollution, ii) circulating products and materials, and iii) regenerating nature.⁴ There are numerous CE strategies, which can be presented briefly under the headline “reduce-reuse-recycle”, or more in detail as done in the 9R framework, which also includes rethink, repair, refurbish, remanufacture, repurpose and recover.⁵

3. Croatia has been lagging the other European Union member states in transitioning towards a Circular Economy. In 2019, Croatia’s material consumption footprint, which captures the total amount of raw materials required to produce the goods used by the economy, totaled 54.1 million tonnes, corresponding to 12.9 tonnes per capita per year. While this is below the estimated EU27 average of 14.5 tonnes per capita, the Croatian economy is also less circular than the EU average. In fact, the Croatian economy is only 2.7 percent circular - leaving a circularity gap of 97.3 percent. This compares to a circularity rate of the EU as a bloc of 12.8 percent.⁶ Croatia generates about 6 million tonnes of waste per year, equivalent to an average of about 1.5 tonnes per capita, which is significantly less than the EU average of 5.2 tonnes per capita. At the same time, the country still relies strongly on landfilling and is lagging behind in meeting the existing EU waste targets for transitioning towards a CE.

4. The Government of Croatia is realizing the challenge and has acknowledged the need to move towards a CE, minimizing waste generation, separating at source, directing waste streams to various ways of utilization and treating waste as a resource. Therefore, the country is looking to speed up meeting EU CE targets and incorporating CE approaches into the current National Waste Management Plan (NWMP) 2017-2022 as well as into the future NWMP 2023-2028. In this context, the Ministry of Economy and Sustainable Development (MoESD) requested World Bank support in implementing CE approaches in SWM. The main role of the World Bank’s RAS was thus to support the MoESD in integrating CE aspects in waste management, specifically in the current NWMP 2017-2022 and the future NWMP 2023-2028, in line with the European Green Deal and its CE Action Plan.

³ A RAS is a customized advisory and analytic service offered by the World Bank to its member countries. RASs support client countries to design or implement better policies, strengthen institutions, build capacity, and inform development strategies or operations.

⁴ <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>

⁵ Potting, J., M. P. Hekkert, E. Worrell, and A. Hanemaaijer 2017. “Circular Economy: Measuring Innovation in the Product Chain”, Planbureau voor de Leefomgeving 2544. <https://dspace.library.uu.nl/handle/1874/358310>.

⁶ While different methodologies have been used to calculate the Croatia and EU figures, they are still representative of the circularity gap between the two.

5. The methodology developed and applied to the RAS rests on two components: CE analysis and capacity building. Under component 1, recommendations have been presented on how to speed up the transformation towards CE. The analysis focused on a diagnostic analysis of the Croatian economy, aimed at understanding the current state of fostering the circular economy in Croatia and to prioritize a sector that can benefit from the development of a CE Action Plan. The CE analysis also provided an analysis of Croatia's current waste legislation in view of proposing concrete measures to strengthen CE approaches in the current and future NWMPs. Under component 2, activities included strengthening of coordination among various stakeholders and promotion of joint ownership of the new waste management agenda. Addressing the low technical and financial capacity of municipalities to separate waste collection and improve recycling, the World Bank provided capacity building and access to cutting-edge knowledge and expertise to all parties involved.

6. This report provides an overview of the five key deliverables of the RAS and draws conclusions for the way forward. Chapter 2 presents the key recommendations for the revision of the NWMP 2017-2022, many of which have been taken up by the Government already during RAS implementation. Chapter 3 focusses on the MFA and priority sector identification. From the four sectors identified for priority action, the Government chose CDW for the development of a sector specific CE Action Plan, which is presented in chapter 4. Chapters 5 and Annex 5 summarize communication and capacity building activities which have been essential for the success and sustainability of the RAS. Finally, chapter 6 presents conclusions and forward-looking actions that Croatia should take on CE approaches in SWM, also in view of the post-2022 NWMP, currently being developed.

2. The Evolving Waste Management Policy Framework in Croatia

7. **This chapter presents key findings and recommendations resulting from an assessment of the National Waste Management Plan (NWMP) of the Republic of Croatia for the period 2017 - 2022 and its Implementing Decision (NWMP ID).** After an overview about Croatia's performance against EU waste targets and the general CE policy landscape in Croatia, the chapter summarizes recommendations developed within the RAS for the revision of the current NWMP 2017-2022 as well as for the development of the future NWMP 2023-2028. The results help in aligning the evolving waste management policy framework in Croatia with the latest EU waste policy, and to shape a waste policy framework which is more circular. While this chapter presents a summary of the analysis, the full results have been published in the RAS [Report on Inputs to National Waste Management Plan and Implementation Decision Revision](#).

2.1 Croatia's Performance against the EU targets

8. **Croatia generates about 6 million tonnes of waste per year, equivalent to an average of about 1.5 tonnes per capita, which is significantly less than the EU average of 5.2 tonnes per capita.** The largest shares of waste are generated by the construction sector (24 percent), households (20 percent), waste and water services (16 percent), and the mining and quarrying sector (12 percent). These four sectors together generate almost 72 percent of all waste in Croatia. Around 1.8 million tonnes of municipal waste were generated in Croatia in 2021.

9. **The country still relies strongly on landfilling and is lagging behind in meeting the existing EU waste targets necessary for transitioning towards a circular economy.** Croatia failed to bring all existing landfills into compliance with the Landfill Directive by 31 December 2018 - a deadline defined by Accession Treaty of the Republic of Croatia to the EU from 2011. Although the share of landfilled waste has decreased by 19 percentage points from 2016 to 2021, the share was still 58.3 percent in 2021. In the past five years, progress in separate collection and recycling of municipal waste was made. However, the total recycling rate for 2021 was 31.4 percent, still significantly below the 50 percent EU target for 2020 set up by the Waste Framework Directive (2008/98/EC). At a similar rate of progress, Croatia also risks missing EU waste targets for the coming years, including increasing the recycling rate of municipal waste to 55 percent by 2025 and 60 percent by 2030, and to reduce landfilling to less than 10 percent by 2030. The amount of biodegradable municipal waste disposed in landfills in 2021 amounted to 594,107 tonnes and reduction targets for 2020 and onwards related to the disposal of biodegradable municipal waste for 2020 and onwards⁷, as defined by the Landfill Directive, have not been reached.

10. **Concerning special waste categories, difficulties have been identified regarding the management of packaging waste (including waste from single use plastic products) and construction waste.** Construction waste contributes 23 percent to total waste generation. In 2020, the recycling rate of construction waste was 60 percent, which is 10 percentage points below the 70 percent EU target for 2020. In 2021, Croatia managed to recycle 51 percent of all packaging, just below the 55 percent EU target for 2020 set by the EU Packaging and Packaging Waste Directive. For specific packaging materials, targets were not met for glass and metal while specific packaging waste targets for paper and board, plastic and wood have been met. Summarized findings of the assessment of Croatian performance against the EU targets and NWMP targets is given in [Annex 2](#) of this Report.

⁷ Biodegradable municipal waste going to landfills must be reduced to 35 percent of the total quantity (by weight) biodegradable municipal waste produced in 1997 (264.661 t).

11. Waste management infrastructure for waste collection and treatment needs improvements for Croatia to meet national needs and comply with the EU waste legislation. Croatia faces numerous challenges in the waste management sector, as analyzed by the World Bank Croatia Solid Waste Sector Review (2020)⁸. Croatia has a complex territorial and organizational structure, comprising of 556 LGUs and 21 counties, which hinder development and implementation of joint waste strategies and common approaches in waste management. Such a decentralized system requires stronger horizontal and vertical collaboration, and stronger institutional capacities and competencies in order to establish the infrastructure and services necessary for an efficient and modern waste management system.

12. Waste management planning needs to be improved and adequate incentives need to be set to make separate waste collection more efficient and to move waste management up the “waste hierarchy”. Monitoring of the waste management system requires strengthening of relevant state administration bodies and educational efforts. Participation of the private sector and other stakeholders needs to be increased. Market principles and the "polluter pays" principle need to be applied to facilitate the development of a well-functioning market for waste and secondary raw materials.

2.2 Circular Economy policy landscape

13. While Croatia does not yet have an integrated circular economy strategy developed with broad stakeholder engagement and existing Croatian strategic documents do not adequately tackle circular economy topics, there is a new opportunity. Currently there is a new cycle of drafting strategic documents, however the circular approach is not sufficiently addressed. This has already been done in the certain strategic documents like the Agriculture Strategy until 2030 (OG 26/22), National Development Strategy 2030 (OG 13/2021), Energy Development Strategy until 2030 with a view to 2050 (OG 25/2020), Climate Change Adaptation Strategy for the period up to 2040 with a view to 2070 (OG 46/20). Although the prospects for establishing a circular economy in Croatia are promising, strengthening synergies and the potential for cooperation and alliance building could accelerate the integration of circularity in both horizontal tools and policies and sectoral focused ones.

14. The main waste strategic policy documents that set the framework for Croatia’s CE transition are: National Waste Management Strategy of the Republic of Croatia (OG 130/05), and the Waste Management Plan of the Republic of Croatia for the period 2017 - 2020 (OG 3/17, 1/22) with its Implementing Decision. The Waste Management Strategy provides the framework for waste reduction and sustainable waste management. The national Waste Management Plan and its Implementing Decision set objectives and measures for establishing waste management aligned with some of the CE criteria. The Plan focusses on developing a recycling and recovery system to separate waste, reducing the total quantity of mixed municipal waste with applying measures such as establishing re-use centers, home composting, financial incentives for separate waste collection, and introducing a fee for landfilling.

15. The NWMP and the accompanying Implementing Decision (NWMP ID) had to be revised in view of alignment with EU legislative changes from 2018 and to ensure timely allocation of EU funding. In addition to integrating circular economy principles in waste management this revision was also important in the context of programming and planning of allocations for the use of EU funds for the next programming period, 2021-2027, as projects and activities defined by the NWMP represent the basis for allocating EU funds⁹. Therefore, Croatia first revised the existing NWMP and is currently developing the new NWMP for the period 2023-2028.

⁸ Croatia Solid Waste Sector Review : Technical Studies - Summaries (English). Washington, D.C. : World Bank Group.

<http://documents.worldbank.org/curated/en/401731562928106241/Croatia-Solid-Waste-Sector-Review-Technical-Studies-Summaries>

⁹ The adoption of the revised Waste Management Plan is both milestone #82 in the RRP (Recovery and Resilience Plan), as well as an enabling condition 2.6 Updated planning for waste management in the framework of the upcoming 2021-2027 ERDF/CF programmes, EU-Croatia Partnership Agreement and Croatia Programme for Cohesion and Competitiveness 2021-2027.

16. **To ensure alignment of NWMP and NWMP ID with EU requirements and to accelerate the transition of the Croatian waste sector to a more circular economy, the following assessments and evaluations were conducted within this RAS for the period 2017-2020:**

- i. NWMP and NWMP ID implementation progress (analyses of current waste management in Croatia, performance against EU waste targets and NWMP targets, implementation progress of defined measures and activities, progress of envisaged funds expenditure);
- ii. Alignment of targets, measures and activities defined by NWMP and NWMP ID with EU waste legislation and assessment of NWMP targets effectiveness;
- iii. Cost re-evaluation for executing NWMP measures and determination of possible funding sources.

2.3 Inputs to the Revision of the National Waste Management Plan 2017-2022

17. **Results generated within this RAS informed the revised National Waste Management Plan for the period 2017-2022, adopted by the Government of the Republic of the Croatia on December 30, 2021 (OG 1/2022), and the new National Waste Management Plan for the period 2023-2028, currently under preparation.** The RAS “Report on Inputs to National Waste Management Plan and Implementation Decision Revision” was developed between November 2020 and May 2021. Along with inputs and recommendations from the World Bank report “Inputs to Revision of the Current Croatian Waste Legislation and National Waste Management Plan to Align with the EU Waste Package”, prepared for the MoESD in 2020, the results informed the preparation of the new Act on Waste Management, adopted in July 2021 (OG 84/2021), the revision of the NWMP 2017-2022, and the preparation of the new NWMP 2023-2028.

18. **Examples of findings and recommendations from the RAS, which were adopted in the revised NWMP for the period 2017-2022 and the Act on Waste Management, include:**

- ***Instead of different sets of waste targets – one set based on EU targets defined in the Act on Sustainable Waste Management and by-laws, and another Croatia-specific set not based on EU targets defined in the NWMP 2017-2022 – only one set of quantitative EU waste targets was transposed by the Act on Waste Management.*** This was proposed by the RAS analysis in view of increasing efficiency of monitoring, amongst others, especially because the indicators for measuring progress of these targets are developed at EU level. Methodology and assessment results of targets defined in the NWMP have been presented in detail in the revised NWMP. Targets to be included in the NWMP 2023-2028 are to be aligned with EU waste targets.
- ***For the proper dimensioning of waste management infrastructure, it is important to improve data on national municipal waste composition on the basis of field sorting analyses.*** For improving municipal waste management systems, it is necessary to improve data on the composition of municipal waste. Current data on the composition of municipal waste is unreliable and based on a limited number of waste composition analyses (county and/or LGUs level) coupled with data from the 2012 Environmental Polluters Register. The RAS recommended to improve data on municipal waste by conducting the determination of the waste composition on the national level based on a field sorting analysis. This new measure was defined in the revised NWMP.
- ***The revised NWMP recognises the importance of introducing new measures related to Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment.*** Following a RAS recommendation, the revised NWMP calls for the establishment of a management system for single-use plastic products (wet wipes, balloons, tobacco products with a filter and filters, and fishing tools that contain plastic), including through awareness raising, education, communication and dialogue among all relevant stakeholders, as well as through the application of economic instruments.

- **Measures not regulated by waste management policy and not under the jurisdiction of the MoESD have been excluded from the scope of the NWMP.** The RAS analysis concluded that it is more efficient to limit the scope of the NWMP to waste management policy under the jurisdiction of the MoESD. The waste management system for wrecks and sunken objects on the seabed is under the jurisdiction of the Ministry of the Sea, Transport and Infrastructure (MSTI) and is not regulated by the waste management policy. Therefore, integrating management in strategic and/or planning documents under the authority of the MSTI seems more effective.
- **The World Bank provided support in setting up the Circular Economy Committee (CEC) foreseen in the revised NWMP.** The intention of the Committee is to become a long-lasting body and to be the main mechanism for cross-sectoral coordination, fostering cooperation of a wide range of stakeholders in the circular economy (see Chapter 5: Communication & Collaboration). The role of the CEC is to support the MoESD in facilitating the development of a long-term vision for mainstreaming CE approaches in waste management and along the entire product life cycle.
- **Numerous potential risks identified by the RAS for the implementation of the NWMP were addressed in the revised NWMP.** Potential risks resulting in slower than anticipated implementation of the NWMP include the slow resolution of legal issues regarding property, the lengthy process of establishing the necessary infrastructure on the sites (such as electricity, water, telecommunication, access to roads etc.), complex and lengthy public procurement processes for contracting all the services needed for project implementation, and many more. Additionally, the “not in my back yard” (NIMBY) effect is an important factor slowing down implementation.
- **Priority areas for investment pipeline activities in the waste sector have been identified by the RAS and included in the revised NWMP.** A summary of the investment pipeline activities is provided in [Annex 4](#) of this report. They include strengthening waste prevention, improving preparation for re-use and recycling, establishing a system for marine litter, ensuring economically and environmentally sound management of residual waste, improving the hazardous waste management system, remediating waste polluted sites, and improving the waste management information system. All identified priority areas, except the one on marine litter management, were defined as priority areas for the transition to a CE within the revised NWMP and will serve the MoESD in the preparation of the new NWMP.

2.4 Recommendations for the Development of the New National Waste Management Plan 2023-2028

19. **The main findings and recommendations for the preparation of the new National Waste Management Plan for the period 2023-2028 are presented below.** They focus on the introduction of a landfill fee, more reliable investment planning, stronger engagement of the private sector, and a communication campaign on the benefits of CE in waste management.

- **The implementation of a landfill fee, as defined by the Waste Management Act and NWMP, could strongly encourage the transition to a circular economy and the achievement of EU targets.** According to the EU WFD, in order to contribute to achieving WFD targets, EU member states should make use of economic instruments to provide incentives for the application of the waste hierarchy, including landfill and incineration charges. Municipal waste management depends on regional and local self-government units and the achievement of waste targets thus depends on their performance. Introducing a landfill fee could intensify the willingness and cooperation between them, consequently speeding up the implementation of measures necessary to move towards a recycling society. Also, the revenues can be used for financing investments in the waste sector.
- **Estimated costs for the implementation of the NWMP indicate a need for more reliable investment planning.** A rough cost re-evaluation of investments planned for executing the measures defined in the NWMP and NWMP ID shows that planned investment costs are underestimated. For example, the total

value of the 9 projects (HRK 4.75 billion¹⁰) exceeds significantly the funding envisaged under item “constructing waste management centres”¹¹ (HRK 1.60 billion). A cost re-evaluation undertaken in the context of this RAS indicates that more reliable investment planning is needed, which is indirectly related to better quality planning of the entire waste management system and the timely preparation of necessary analytical studies. The RAS provided a methodology (and results) for the cost re-estimation, which can also be applied for future waste investment planning.

- ***Private sector engagement is critical in activities like separate waste collection, construction of sorting facilities, recycling yards, facilities for biological treatment and treatment of mixed municipal waste.*** The waste management system in Croatia is heavily reliant on public funding and the market’s role is limited. In fact, 98 percent of NWMP and NWMP ID-related investments are to come from the public sector and only 2 percent from the private sector.¹² Mobilizing private sector finance, for example into collection and treatment systems of municipal waste, can reduce pressure on public budgets (e.g. by reducing the costs and management burden of LSGUs) and help deliver innovations in waste management infrastructure and services faster than the public sector alone.
- ***It is recommended to start with intensive and transparent communication campaigns targeted at the interested public, citizens and civil society groups.*** Currently in Croatia, there is a great resistance toward waste management-related projects. For a successful transition to circularity in waste management it is important for citizens to understand the benefits of circularity and the diversity of CE activities, but also potential costs and distributional effects.

¹⁰ Data provided by EPEEF/FZOEU

¹¹ Measure M 1.4.5 in NWMP

¹² „Solid Waste Sector Review - Catching up and getting ahead“, World Bank, 2020.

3. Preparing the Grounds for the Circular Economy Action Plan

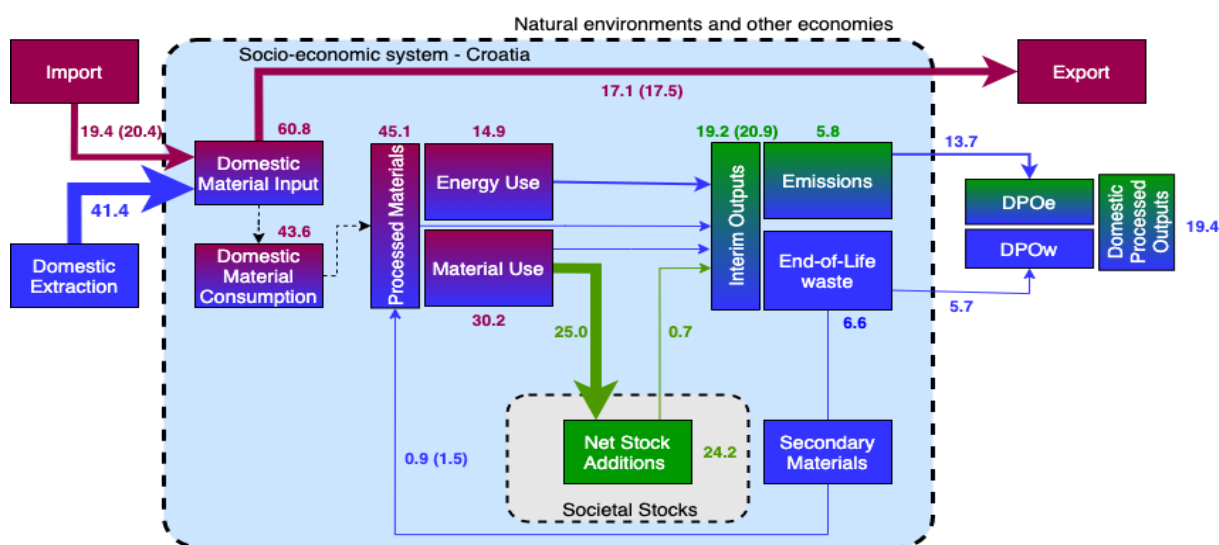
20. **Chapter 3 prepares the grounds for the development of the Circular Economy Action Plan, which is presented in the next chapter.** The chapter provides a summary of the RAS deliverable [Diagnostic Analysis](#), which contains a material flow analysis (MFA) completed for the Croatian economy and identifies four sectors proposed for priority action to accelerate the CE transition. The MFA conducted for the Croatian economy reveals that Croatia is only 2.7 percent circular – leaving a circularity gap of 97.3 percent. The diagnostic analysis also presents methodology and results of the focus sector identification, and the resulting four sectors proposed for priority action, including food, construction, plastics (including plastics packaging), and textile. From these four sectors, the MoESD chose construction and demolition waste (CDW) as the priority sector for the development of a Circular Economy Action Plan, as described in Chapter 4.

3.1 Material Flow Analysis for Circular Economy in Croatia

21. **The Material Flow Analysis conducted for Croatia shows that the economy is still largely linear with a Domestic Material Consumption of 43.6 million tonnes, equivalent to some 10.4 tonnes per capita.** According to Eurostat, Domestic Material Consumption (DMC) measures the total amount of materials directly used by an economy and is defined as the annual quantity of raw materials extracted from the domestic territory, plus all physical imports minus all physical exports.¹³ Figure 1 shows that in 2019, Croatia’s DMC amounted to 43.6 million tonnes, the equivalent of about 10.4 tonnes of resources per capita. This is significantly less than the EU27 average of 14.2 tonnes per capita.¹⁴ The MFA also shows that secondary materials consumed in Croatia are very limited in amount, estimated at about 1.5 million tonnes.

¹³ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Domestic_material_consumption_\(DMC\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Domestic_material_consumption_(DMC))

¹⁴ https://ec.europa.eu/eurostat/databrowser/view/sdg_12_20/default/table?lang=en,
<https://ec.europa.eu/eurostat/databrowser/view/tps00001/default/table?lang=en>

Figure 1 - Material flow analysis of Croatia's economy (direct flows in million tonnes)¹⁵

Note: The size of the arrows is roughly proportional to the volume of the flow. Figures between parentheses show the total of primary and secondary imports/exports. Source: Own elaboration according to the framework of Mayer et al. (2018)¹⁶

22. When accounting for the total material footprint of imports and exports, Croatia's demand for natural resources increases to 54.1 million tonnes in 2019, corresponding to 12.9 tonnes per capita. DMC only accounts for the actual weight of imported/exported goods. Measuring imports/exports in Raw Material Equivalents (RME), in contrast, accounts for all raw materials required to produce these goods. Accounting for imports and exports in terms of RME increases physical imports by around 50 percent to 30.1 million tonnes and exports slightly to 17.4 million tonnes. Croatia's material footprint, which captures the total amount of raw materials required to produce the goods used by the economy, in 2019 totaled 54.1 million tonnes, corresponding to 12.9 tonnes per capita. This compares to an estimated average of 14.5 tonnes per capita in the EU27.¹⁷ The large difference between the actual weight of imports and their mass in RME shows that Croatia is outsourcing significant environmental impacts to third countries.

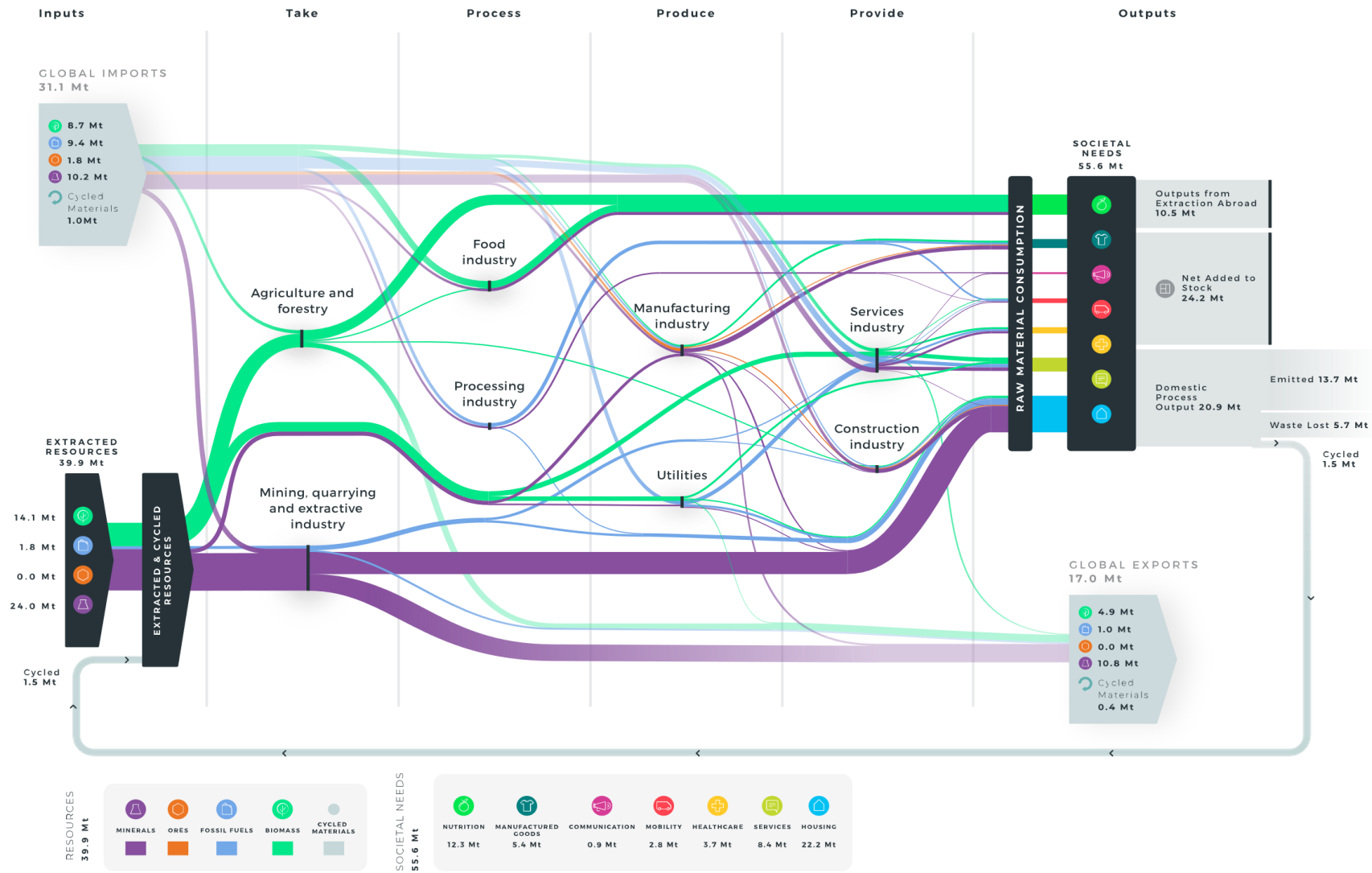
23. In terms of composition, Croatia's material footprint is dominated by non-metallic minerals, followed by biomass and fossil fuels; societal needs are dominated by housing, nutrition and services. Non-metallic minerals dominate the composition of Croatia's materials footprint with 43 percent, followed by biomass (34.5 percent), fossil fuels (18.6 percent), and metal ores (3.4 percent). The Sankey Diagram (Figure 2) shows that societal needs are dominated by housing (40 percent), primarily using non-metallic minerals. Nutrition contributes 23 percent to Croatia's material footprint, mainly in the form of biomass. Services rank third, with 15 percent of the total share and approximately half of the materials consisting of biomass and the remainder almost equally consisting of non-metallic minerals and fossil fuels. The remaining societal needs make up a smaller fraction of the total material footprint, with manufactured goods amounting to 10 percent, healthcare to 7 percent and mobility to 5 percent.

¹⁵ For the material flow accounting of Croatia's economy, different data sources and baseline years are used as no single baseline year can be identified. Thus, the decision was made to use the most recent year available for each dataset/database. The baseline year of each data set is as follows: i) macroeconomic monetary data for the Input-Output Table (year 2016), ii) domestic extraction data for all regions (year 2019); iii) waste generation and treatment data (year 2018); iv) air emission data by NACE sectors (year 2018).

¹⁶ Mayer, A., Haas, W., Wiedenhofer, D., Krausmann, F., Nuss, P. & Blengini, G.A. (2018). Measuring Progress towards a Circular Economy: A Monitoring Framework for Economy-wide Material Loop Closing in the EU28. doi:10.1111/jiec.12809

¹⁷ https://ec.europa.eu/eurostat/databrowser/view/env_ac_rme/default/table?lang=en

Figure 2 - Sankey diagram visualizing the material footprint behind satisfying Croatia's societal needs and link with the four key resource groups



SOURCE - Circle Economy Analysis, Exiobase v3.8 + HR resource extraction data 2016

24. Overall, Croatia’s economy in 2019 was only 2.7 percent circular¹⁸—leaving a circularity gap of 97.3 percent and making it less circular compared to the global average. Croatia's economy is 2.7 percent circular—but what makes up the other 97.3 percent? Ecological cycling—or the share of renewable primary biomass, from food crops and agricultural residues to wood—comes in at an estimated 23.2 percent. Non-circular inputs—the gasoline, diesel and natural gas burned for energy, which are inherently non-circular—make up 10.7 percent of the economy, while non-renewable inputs—non-fossil and non-biomass materials, like metals or plastics that are not cycled, account for just 1.1 percent. The largest portion—43.6 percent—of Croatia's dashboard of indicators is claimed by additions to reserves and stocks, like new buildings and infrastructure. In comparison, the global Circularity Metric in 2020 was 8.6 percent, well above the Croatian circularity metric of 2.7 percent. Norway’s circularity rate stands at 2.4 percent, Austria’s at 9.7 percent and The Netherlands at 24.5 percent.

3.2 Identification of Priority Sectors for Circular Economy Initiatives

25. Based on the assessment of the current state of the circular economy in Croatia, a sector analysis was undertaken aimed at identifying sectors which should be prioritized for circular economy initiatives. While the circular economy will require a system wide transition across all economic sectors, the approach of focusing on priority sectors allows for strategic action based on potentials and impacts. The selection of sectors to be analyzed was based on the sectors included in the EU Circular Economy Action Plan (CEAP) of 2020 and includes electronics, batteries, vehicles, packaging, plastics, textiles, construction, and food. The ranking of these sectors was done using two different approaches: a quantitative analysis based on a set of nine selected indicators, and a qualitative analysis based on literature and expert interviews.

26. The quantitative analysis revealed packaging, food, plastics, and construction as the four sectors to be prioritized on the circularity agenda. The quantitative analysis is based on nine quantifiable indicators which can be grouped in three categories: (i) significance of the sector in the Croatian economy (four indicators), (ii) contribution to waste streams (one indicator), and (iii) circularity potential (four indicators). To prioritize circularity and environmental effects, indicators on waste streams and circularity potential were weighted twice as high as economic indicators.

27. The qualitative assessment revealed the highest potential for circularity in the food, plastics, textile, and construction sectors. Given challenges with data that affected the confidence in the quantifiable indicators, further prioritization based on non-quantifiable criteria was undertaken. This qualitative assessment was based on a literature review and expert interviews and looks at general framework conditions necessary to move toward the circular economy, including national priorities and existing barriers and enabling conditions. However, this was a subjective exercise with less granularity in assessing the differences across sectors than the quantitative analysis.

¹⁸ This circularity gap is measured by circularity metric, which is an economic-wide indicator of the state of circularity of an economy with the following characteristics: i) input-side indicator, measuring the share of secondary material consumption of the total material consumption, ii) consumption-based, ii) based on RMC rather than the DMC.

Box 1 - Brief overview of the four sectors identified for priority action

Priority Sector	Description
Food	The food sector's footprint—amounting to 5.65 million tonnes—represents approximately one-tenth of the country's material consumption. It also acts as a significant source of waste, producing 0.11 million tonnes (most of which is landfilled) and emissions, releasing 1.65 million tonnes of CO ₂ e. The sector was highlighted as a key lever for impact due to its ties with other core economic sectors—such as tourism—and its growing relevance in policymaking and social spheres. Strategies range from prioritizing the products of fresh, local goods and making use of surplus food, to improving separate organic waste collection and processing and valorizing such waste by scaling up biofuel production.
Plastics	While the plastic sector's material and carbon footprints are low—just 0.21 million tonnes, responsible for an equal weight of emissions—its ubiquitous impact on marine life and biodiversity has brought it into the public and political spotlight. The sector, and the pollution it generates, also pose a significant threat to tourism, one of the main engines of Croatia's economy, resulting in a recently enacted ban on single-use plastics. Strategies for the sector are based on maximizing the recyclability and reusability of plastics through eco-design alternatives, implementing take-back schemes and developing improved recycling infrastructure.
Textile	The textile sector's material footprint is also relatively low, coming in at 1.6 million tonnes, and it emits about 0.80 million tonnes of CO ₂ e—less than 3 percent of Croatia's total emissions. However, the textile sector has garnered attention across the globe in recent years for its resource-intensive, polluting nature—momentum that is reflected in policy action. Strategies in this sector revolve around bolstering eco-design, increasing separate collection rates, developing improved infrastructure for cycling and stimulating the uptake of repair services and second-hand offerings.
Construction	Construction takes the lead in material footprint and waste for the sectors explored, with consumption topping 11.5 million tonnes—equal to roughly one-fifth of the nation's economy. It accounts for one-third of Croatia's waste stream, producing 1.77 million tonnes, and about 13 percent of emissions, producing 3.64 million tonnes of CO ₂ e. The sector is also characterized by high energy and water use, making it an especially potent hotspot. Strategies are based on closing flows by reusing building materials, designing for disassembly, adaptability and reduced energy consumption, and maximizing the use and lifetime of current stocks.

28. Four sectors were proposed for priority action (see Box 1), from which the MoESD chose construction and demolition waste (CDW) as the priority sector for the development of a Circular Economy Action Plan. Following the quantitative and qualitative prioritization exercise, four sectors were proposed for priority action, including food, construction, plastics (including plastics packaging),¹⁹ and textile. From these sectors, the MoESD chose CDW as the priority sector for the development of a Circular Economy Action Plan. The decision of the ministry was based on economic, environmental, institutional and practical considerations. Most significantly, this decision was influenced by the urgency for action in the wake of two earthquakes in 2020 and the related surge in CDW, which raised public interest in CDW management activities, and showed that CDW management infrastructure needs urgent development and new investments.

¹⁹ Plastics and packaging were merged since the regulatory and institutional framework for them is similar.

4. Circular Economy in the Construction and Demolition Waste Sector – Action Plan

29. This chapter presents the proposed [Circular Economy Action Plan \(CEAP\) for the Croatian Construction and Demolition Waste \(CDW\) Sector](#), and the accompanying [Annex 1: Priority Measure Analysis](#), developed under this RAS. It illustrates the sector-specific challenges that Croatia is facing in promoting more circularity in the CDW sector and recommends potential measures and actions that may help to accelerate the CE transition of the Croatian CDW sector. The CEAP development started with a diagnostic analysis of the CDW sector to understand the current status of CDW management and recycling in Croatia. Based on the analysis and multiple stakeholder consultations, the diagnostic extracted six major challenges in the CDW sector and translated them into the corresponding objectives of the CEAP. To propose the best available measures and actions for the CE transition in Croatia, a stocktaking of international good practices and policy examples on CE in the CDW sector was conducted to provide guiding principles for the development of the CEAP in Croatia.

4.1 The Croatian Construction and Demolition Waste Sector

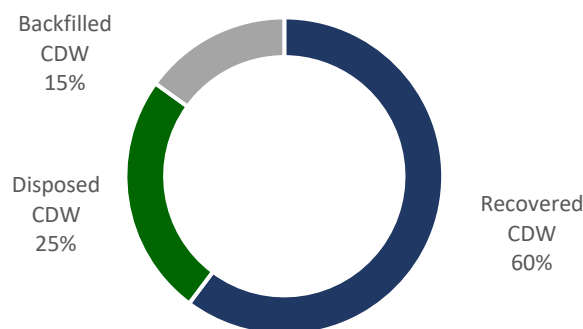
30. The CDW sector in Croatia generated 1.4 million tonnes of waste in 2020, representing the largest waste stream in the country. CDW generation has increased over the past few years, a trend which is likely to continue. Several factors are contributing to growing CDW generation. First, there has been strong demand for housing over the past few years, driven by low-interest rates on housing loans as well as government subsidies for young people to buy their first property. Second, there has been a trend of rising demand for real estate by foreigners. As much as 25 percent of real estate was bought by foreigners in 2020²⁰. Third, in coming years, there are likely large-scale reconstructions in the places affected by the recent earthquakes, given that Croatia received a significant amount of grants from the European Solidarity Fund to fix damages caused by the earthquakes.

31. Despite improvements in CDW management, Croatia has not met the EU CE target for CDW. CDW management in Croatia is mostly based on low-grade recovery techniques such as backfilling and aggregate production and, despite continuous growth in CDW volume, it has not reached the recovery targets defined by the Waste Framework Directive (WFD) of 70 percent. Based on data reported by MoESD the amount of CDW recovered in 2020 was 60 percent.²¹ Landfilling and the use of CDW as backfill material cover 40 percent of waste management (Figure 3). Moreover, most Croatian CDW management plants are located in the north of the country. The regional disparities in CDW treatment and management capacity also discourage demolition operators from sorting and collecting them properly due to the lack of plants and the high transport costs of CDW materials compared to their remaining economic value. The absence of local treatment and recovery capacity leads to the informal use of CDW in road maintenance or, in the worst case, to illegal dumping.

²⁰ Real estate association at the Croatian Chamber of Economy (2021). Source: <https://www.hgk.hr/cijene-nekretnina-u-prosieku-narastle-za-sest-posto-ali-ocekivani-rast-kamata-mogao-bi-dovesti-do-korekcije-najava>.

²¹ https://www.haop.hr/sites/default/files/uploads/dokumenti/021_otpad/Izvjescja/ostalo/OTP_Izvjescja%20otpad_2019_WEB.PDF.

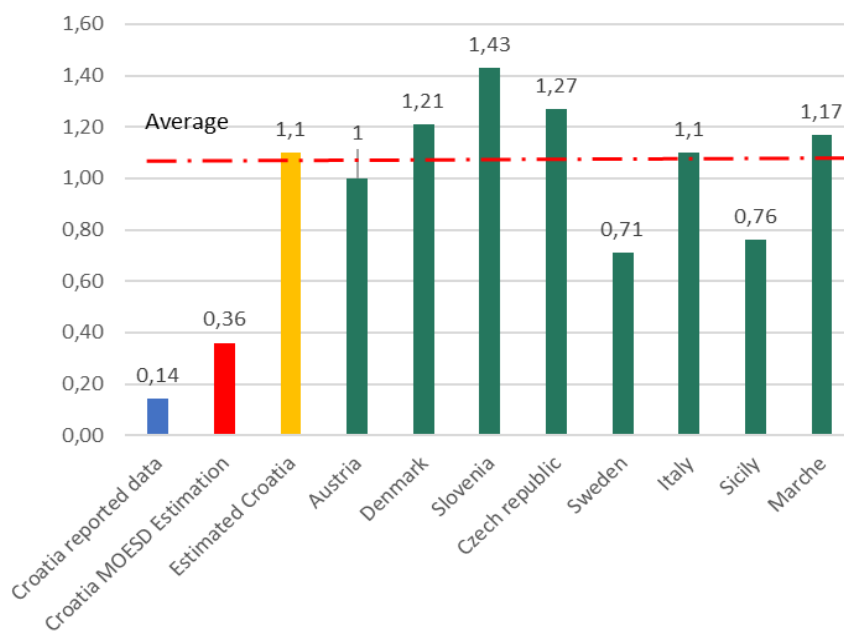
Figure 3 - CDW Management Operation in Croatia



Source: MoESD

32. The reported per capita generation of CDW in Croatia may be significantly understated. Using the 1.4 million tonnes of annual CDW generation as a basis for calculating per capita CDW generation shows that CDW generation per capita in Croatia is significantly lower than the average value calculated for some EU countries and regions (Figure 4). The result of the comparison with other European countries' CDW generation per capita indicates that the CDW data reported by the MoESD underestimated the real CDW generation and/or there are CDW generation amount which were misreported or informally used/disposed of, though it is necessary to consider the different architectural and construction customs and the different economic development status of these countries. Without accurate data and information collection system, policy making and infrastructure investment to cater the actual CDW is challenging.

Figure 4 - Average per capita generation of CDW in Croatia and other member states



Source: Eurostat – Own elaboration



4.2 Main Challenges that hinder the Circular Economy Transition in the Construction and Demolition Waste Sector

33. **Croatia has set the vision to reduce CDW generation by 2030 in its National Development Strategy.** This vision is embodied in several existing policy instruments such as the Croatian Recovery and Resilience Plan 2021-2026, the National Waste Management Plan of the Republic of Croatia for the 2017–2022 and the Waste Management Act. All of them present ambitious objectives in energy efficiency, greenhouse gas emissions, waste management, and efficient use of materials in the CDW sector.

34. **The diagnostic analysis of CE in Croatia identified six challenges that hinder progress in accelerating circularity in Croatia’s CDW sector.** These challenges are presented in Box 2 and have been the basis for developing the CEAP. For the CEAP development, the challenges were translated into objectives/goals, with concrete measures developed for their achievement. These are outlined in the next section. One of the key challenges identified is the absence of a shared version among CDW stakeholders which is the basis for successful implementation of circularity measures.

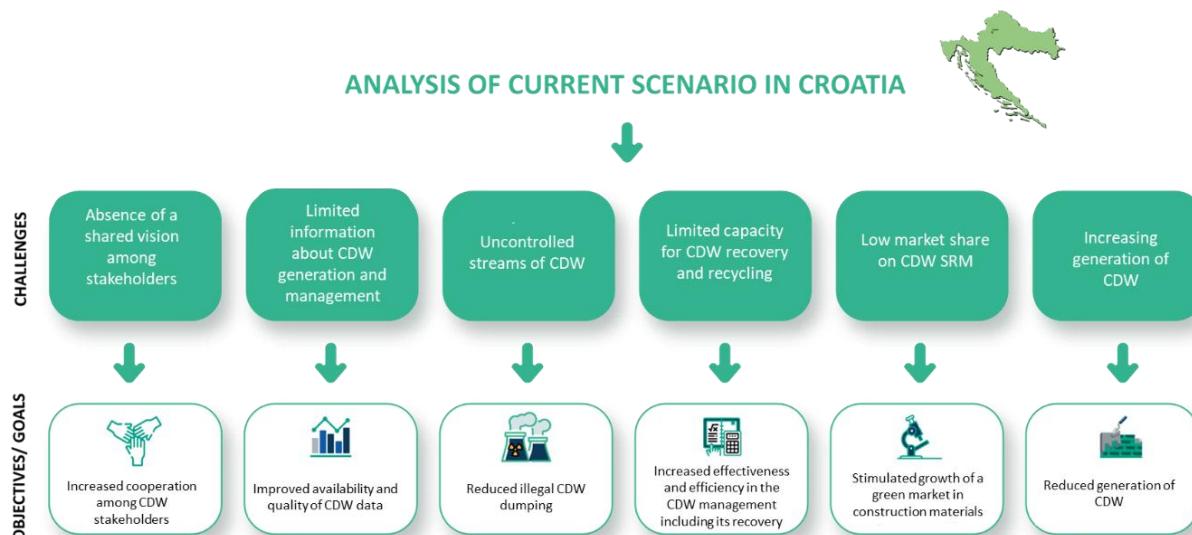
Box 2 – Challenges for the development of CE in the CDW sector

1. **Absence of a shared vision among CDW stakeholders** leads to the lack of cooperation among stakeholders. This is, particular between industry and government, impacted in the limited sharing of information and data and lack of commitment in enforcing the CDW related waste legislation. Consequently, the legislative framework doesn’t include the needs of the CDW stakeholders in its value chain and limits its enforcement.
2. **Lack of CDW data and information** makes it difficult to define adequate policies for its efficient management. lack of data is related to specific exclusions defined by the law on the transmission of waste data, but also due to limited enforcement of legislation and the limited number of controls and related sanctions.
3. **Informal and illegal CDW streams** was identified as one of the main problems in the country which hasn’t been taken into account by official statistics (260 kt according to the analysis conducted of this activity); they are composed mainly of unsorted CDW materials and excavated soils. A large part of CDW is still illegally dumped, according to the stakeholders consulted as part of this study. The illegal management of CDW reduces costs compared to the official CDW management system, and the phenomenon is not effectively prosecuted due to its low-value, limited awareness about the environmental impact of CDW, and the absence of a reliable and affordable legal solution close to the production sites.
4. **Limited capacity for CDW recovery and recycling** inhibits the increase in recycled CDW. To bridge the gap between recovery rate of Croatia and the target set by EU, increasing the capacity to process and recycle CDW, increasing the number of available recycling facilities and yards for CDW, increasing their capacity and renewing existing technology to generate valuable materials for the market are critical. The absence of such facilities in the proximity of construction and demolition site is discouraging the waste operators to properly sort the recyclable portions of waste. Moreover, Lack of reliable recycling and treatment alternatives is considered the moral justification for illegal dumping.
5. **Low market share on CDW secondary raw materials (SRM)** is due to the uncertainty and lack of confidence in the quality of CDW generated SRM. Lack of confidence needs to be strengthened through more advanced hazardous removal and waste separation system. Testing method and quality certification of the CDW derived SRM can also promote gaining confidence among the SRM users – to address the barriers related to the quality of products from recycled materials and increase waste separation and hazardous waste removal (decontamination) of CDW.
6. Due to the increase in economic activity, **CDW generation is in increasing trend.** Strong housing market, tourism development increases construction. Aging society and population decrease accelerates the excess supply of housing which may lead to the increase in building demolition. Both contributes to the increase in CDW.

4.3 Circular Economy Action Plan for Construction and Demolition Waste sector

35. The objectives set for the development of the CEAP for the Croatian CDW sector, aligned and complementary to the NWMP, aim to address the six identified key challenges. Figure 5 shows the challenges identified as a result of the diagnostic analysis and the correlation between the challenges and the proposed objectives/goals.

Figure 5 - Identified Challenges and Objectives for the CDW sector CEAP for Croatia



36. International and regional good practices in CDW management were collected and integrated as part of the development of the proposed CDW CEAP (see Box 3). Several European countries are ahead of the EU average in the implementation of circular economy actions in the construction sector, which has had a positive impact on the development of the circular economy concept and the improvement of European legislation. Thus, good practices in other European countries have been examined to fill the gaps where Croatia is lagging behind.

Box 3 – Exposure to International Good Practices

Throughout the course of the RAS, international good practices from other EU countries were collected for CE and CDW management as part of the analytics ([Annex V of CE Diagnostics Analysis: International Good Practices and Policy Recommendation](#); CE Action Plan Annex II) and the capacity building program.

International good practices in the CDW value chain include EU legislation and voluntary commitments. Specific procedures adopted in several countries²² include mandatory pre-demolition audit, mandatory sorting of CDW (most commonly for recycled cement), mandatory separate collection of specific CDW (for example plastic pipes or asphalt and bitumen) and mandatory green public procurement. For implementation of these measures, strong stakeholder cooperation and communication is needed.

During the RAS, Croatian stakeholders participated in a **capacity building program**, including exposure to international best practices. This program offered tailored webinars and study visits to Slovenia and The Netherlands.

During the **study visit to Slovenia**, participants engaged with Slovenian stakeholders and learnt about

²² The countries Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxemburg, the Netherlands, Poland, Portugal, Slovenia, Spain and Sweden have adopted one or more of the following best-practice measures related to the CDW value chain.

the Government’s strategy to accelerate circularity. The strategy includes maximizing the use of EU funds towards CE, an enabling national policy framework for CE and strong stakeholder engagement, while providing business opportunities with good returns on investments.

The focus of the **study visit to The Netherlands** was the circular city development in Amsterdam, including key strategies and approaches for managing solid waste and transitioning to the circular economy in The Netherlands. The participants visited facilities of best practices from upcycling and waste as a resource for new products, including in construction of new buildings.

37. In the construction sector, circular economy thinking is applied in all stages of the material and building life cycle to ensure that the building materials and components are kept in a closed loop. The identification of good practices covered the whole lifecycle of construction products from design to end of life. The proposed measures for the CEAP in the CDW sector to achieve its objectives are summarized in Table 1 below. Also, the actions to achieve each measure are listed. Years indicated are the expected period of implementation and different colored bars represent the proposed responsible authority in charge. The proposed CDW CEAP elaborates on the description of each action, responsible authority, major implementors of action, estimated budget, and indicators for monitoring. The details are presented in a more detailed table with a description of each action in the proposed CEAP itself.

38. Throughout the RAS and the development of the CEAP, support was also provided in sharing knowledge on circular economy and its benefits in the context of waste management, with a particular focus on construction and demolition waste management. As outlined in detail in the RAS output “[Summary of Capacity Building Programs](#)”, three types of educational activities were organized: six in-person trainings on sustainable CDW management; three webinars on selected CE topics (identified by the Diagnostic Assessment); as well as two study visits showcasing good practice examples of Slovenia and the Netherlands. Training programs²³ were organized in cooperation with the [Environmental Agency Austria \(EAA\)](#). The capacity building activities performed and required for the new NWMP 2023-2028 are summarized in [Annex 5](#).

39. The capacity building activities proved that continuous information, knowledge sharing and collaboration between the public authorities, the business, consumers and civil society, academia, and NGOs is of utmost importance for successfully adopting the circular economy practices. The involvement of stakeholders would also be instrumental in the future the development of regulations and standards, and the construction sector should be involved in the formulation of realistic and implementable measures related to that sector. Specific target groups were identified to formulate recommendations for future capacity building programs, which are summarized in [Annex 5](#).

²³ All the training materials, including the Capacity Building Report, developed under the CE RAS are made available on MoESD website ([Featured Topics](#) section), and on the World Bank Croatia project pages: [Circular Economy Approaches in Solid Waste Management](#).

Table 1 - Roadmap for the CEAP proposed measures and actions

OBJECTIVE	MEASURE	2023	2024	2025	2026	2027	
Increased cooperation among CDW stakeholders	M.1.1. Enhance dialogue and cooperation among CDW stakeholders	A.1.1.1. Creation of a CE platform for CDW management to discuss regulatory provisions, and new opportunities, and share information.					
	M.1.2. Enhance education and support for research, innovation, and development	A.1.2.1. Organization of specific annual educational programs including meetings with local administrations and the drafting of a handbook related to innovative recovered materials, reuse, and recycling within the framework of CE and CDW regulatory requirements.			A.1.2.2. Development of an R&D program for CE in the CDW sector through the creation of national or EU funds.		
Improved availability and quality of CDW data		M.2.1. Implement educational and informative activities related to CDW reporting	A.2.1.1. Educational activities, including training, guidelines, and handbook, on the topic of CDW management reporting data within the framework of the CE.				
	M.2.2. Improve CDW management information system applications	A.2.2.1. Enhanced interoperability between EONTO and ROO for data collection regarding CDW quantities and treatment.					
		A.2.2.2 Enhanced the usability of EONTO through the creation of a mobile application.					
					A.2.2.3. Integration of recovered material data generated on-site in the construction permit database for building sites with an expected CDW generation greater than 200 t.		
		A.2.2.4. Integration of digital applications related to CDW on the joint IT platform of waste management in the Republic of Croatia, as part of the national environmental protection and circular economy platform.					
					A.2.2.5. Creation of a Materials Passport and a related database to register materials used in construction projects to ease the recognition of hazardous material, future dismantling phase, and recovery of resources.		
	M.2.3. Improve availability and quality of CDW management data before and during operating sites				A.2.3.1. Introduction of obligations to prepare CDW Management Report as part of Main Project before issuing Construction Permit for sites with an expected CDW generation greater than 200 t.		
					A.2.3.2. Drafting of standard forms and an online tool for compiling and submitting the CDW Management report.		
					A.2.3.3. Approval of a bylaw for the enforcement of a mandatory financial bond for construction projects to cover the cost in case of mismanagement of CDW on the building site.		
	M.2.4. Implement pre-demolition audit for construction sites			A.2.4.1. Amendment to Law on Construction to include pre-demolition audit based on EC guidelines for construction sites with an expected CDW generation greater than 200 t.			
		A.2.4.2. Definition of guidelines on Selective and Removal of Hazardous Components based on the European Guideline.					
			A.2.4.3. Training for the enforcement of guidelines on Selective and Removal of Hazardous Components (the guidelines developed in A.2.4.2.).				
Reduced illegal CDW dumping	M.3.1. Increase education of relevant bodies involved in CDW management inspection processes	A.3.1.1. Training programs for CDW management supervision and inspection bodies and parties.					
	M.3.2. Strengthen regulation and controls to reduce illegal dumping of CDW			A.3.2.1. Enforcement of waste management regulation to strengthen the control powers of local authorities and state inspectorate on environmental crimes related to illegal waste management.			
				A.3.2.2. Enforcement of construction law and introduction of mandatory cost breakdown for CDW management in technical project proposals to support companies that propose proper CDW management.			
		A.3.2.3. Investment in technological equipment such as capturing cameras and remote cameras to increase and automatize controls against illegal dumping.					
		A.3.2.4. Creation of ELOO mobile application for citizens to ease the anonymous reporting of CDW illegal dumping.					
					A.3.2.5. Strengthen sanctions and fines against illegal dumping.		

OBJECTIVE	MEASURE	2023	2024	2025	2026	2027
	M.3.3. Remove CDW from illegal dumpsites	A.3.3.1. Removal of CDW (or mixed waste) from locations contaminated by waste dumped into the environment.				
Increased effectiveness and efficiency in CDW management including its recovery	M.4.1. Improve EoW status legislation for CDW		A.4.1.1. Feasibility study for the identification of potential "by-product for non-contaminated excavated soil" and "EoW status for specific CDW streams."			
			A.4.1.2. Definition of a guideline on the enforcement of EoW and relevant Ordinance No. 117/14.			
			A.4.1.3. Training sessions on the guideline on the enforcement of EoW (A.4.1.2.).			
	M.4.2. Improve hazardous waste removal and asbestos disposal system		A.4.2.1. Analysis and assessment (report) of the existing and required number and capacity of areas for the disposal of CDW containing asbestos and treatment of hazardous CDW.			
			A.4.2.2. Grants for the development of installation for the recycling of contaminated soils (EWC 170503*) based on BAT.			
		A.4.2.3. Financial support for the collection and disposal of asbestos-containing material from existing buildings.				
	M.4.3. Construct and equip recycling yards for construction and demolition waste "Type A"	A.4.3.1. Construction and equipping of municipal or regional "Type A" recycling yards for CDW on the mainland.				
		A.4.3.2. Construction and equipping of municipal or regional "Type A" recycling yards for CDW on the most populated island.				
	M.4.4. Construct and equip recycling yards for construction and demolition waste "Type B" for processing CDW	A.4.4.1. Construction and equipping of "Type B" recycling yards for processing CDW, equipped with mobile equipment to service municipal and regional requirements.				
		A.4.4.2. Construction and equipping of "Type B" recycling yards for processing CDW, as part of waste management centers equipped with mobile equipment to service municipal and regional requirements.				
M.4.5. Build and equip facilities for CDW analysis and quality control		A.4.5.1. Financial funds for the development of authorized quality control infrastructure for CDS SRM.				
Stimulated growth of a green market in construction materials	M.5.1. Improve the existing application to develop a CDW Exchange	A.5.1.1. Improvement, development, and implementation of a web-based tool such as CDW Exchange or marketplace for materials recovery and secondary materials exchange.				
	M.5.2. Create guidelines on Green Public Procurement (GPP)	A.5.2.1. Creation of guidelines for GPP of the office building design, construction, and management.				
			A.5.2.2. Implementation of GPP pilot project by guidelines for office building design, construction, and management.			
			A.5.2.3. Creation of guidelines for GPP of road design, construction, and maintenance.			
			A.5.2.4. Implementation of GPP pilot project by guidelines for road design, construction, and maintenance.			
				A.5.2.5. Feasibility study for the introduction of a minimum quantity of recycled/reused materials in public constructions and infrastructures in the construction law.		
Reduced generation of CDW	M.6.1. Develop guidelines for the reuse of building components, conversion, and renovation of buildings	A.6.1.1. Drafting of a guideline on the identification of reusable components including a positive list of elements such as doors, windows, and other non-structural parts.				
					A.6.1.2. Development of guidelines for sharing, conversion, and renovation of buildings including recommendations for amendments and supplements to spatial plans.	
		A.6.1.3. Dedicated grants to support the local administration and private companies in restoring buildings instead of demolition by guidelines and to promote sharing, conversion, and multifunctional uses of public buildings.				
M.6.2. Enhance take-back systems in CDW to increase reused and recycled content	A.6.2.1. Feasibility study for the introduction of "take back system" on specific CDW scraps and unused materials as 17 01 concrete, bricks, tiles, and ceramics; 17 03 bitumen mixtures, coal tar and					

OBJECTIVE	MEASURE	2023	2024	2025	2026	2027	
		products containing tar; 17 08 building material based on gypsum.					
				A.6.2.2. Pilot project to enhance "take back system" on select CDW stream based on the result of the study set out in A.6.2.1.			
	M.6.3. Implement educational and informative activities on eco-design in public and private buildings	A.6.3.1. Implementation of educational and informative activities on the topic of eco-design in public and private buildings to raise technical knowledge and education for engineers, architects, technicians, contractors, and public administration.					
					A.6.3.2. Design and construction of an eco-design pilot project in a public building.		
					A.6.3.3. Reduction of planning fees for construction projects that use recycled or reused materials or adopt eco-design criteria focused on future reduction of CDW generation.		
	M.6.4. Develop guidelines for sharing, conversion, and renovation of buildings	A.6.4.1. Development of guidelines for sharing, conversion, and renovation of buildings including recommendations for amendments and supplements to spatial plans.					
					A.6.4.2. Dedicated grants to support the local administration and private companies in restoring buildings instead of demolition by guidelines and to promote sharing, conversion, and multifunctional uses of the public buildings.		

Note: Different colored bars represent the responsible authority for each action.

CEC	HGK	FZOEU	MoESD	MPGI	JLS and JRS
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40. The estimated costs of CEAP implementation over 2023-2027 are estimated at EUR 120.5 million. These estimations are based on stakeholder consultations and inputs provided through collaborative online tools. Annualized costs over the five-year implementation period of the CEAP are EUR 13.3 million for the first year, EUR 23.2 million for the second, EUR 30 million for the third, EUR 26.4 million for the fourth, and EUR 29.1 million for the fifth year.

41. The actions aimed at creating greater collaboration between public and private stakeholders were considered as the most important elements of the proposed CEAP. The forty-seven proposed actions were indexed with the help of an impact factor calculated based on five criteria: environmental impact; technical and economic feasibility; alignment with regulation and policies; scalability; and stakeholders’ interest. Greater collaboration between public and private stakeholders was ranked highest (albeit with a low margin between different proposed actions). Indeed, mutual trust among stakeholders is a fundamental prerequisite and for this reason CEAP foresees specific actions with the aim to create a communion of purpose between public and private stakeholders. Most stakeholders are aware that the key element is the full and active involvement of all the representatives of CDW value chain in the decision process about CEAP.

42. The collection of quality data on CDW generation and management is a prerequisite for the success of the CEAP. Improving the integration of existing IT tools for CDW data collection and training of operators on their use are the actions identified to reach a more detailed and accurate picture of how CDW is managed. This information is also needed to enable monitoring of the measures included in CEAP itself.

43. The CEAP requires particular attention to defining a set of regulations that will simplify the permitting phase for installations that carry out CDW collection on the territory and the successive recycling into SRM. This will make possible the establishment of a network of plants that can respond to the growing generation of CDW and provide a viable alternative to reduce the still frequent phenomena of CDW dumping. Complementary to the creation of a consolidated supply chain of CDW derived materials, the CEAP foresees measures for the creation of a stable demand for recycled materials. The Green Public Procurement represents the tools to consolidate the market of SRM.

44. CEAP identifies as a short-term target the overcoming of existing challenges and, as a long-term target the full transformation of the CDW value chain with and the minimization the CDW generation. The second target, in order to be achieved, requires the implementation of dedicated measures focused on the creation of strong awareness about the environmental impact caused by inefficient management of

CDW since the initial stages of CEAP. This will lead the construction sector to a profound transformation that will include the adoption of new design methods based on the concepts of eco-design and innovative use of existing buildings to reduce the demand for new buildings. The enforcement of dismantling procedure, reuse of building components and restoration instead of demolition, will allow, in the long run, a reduction of CDW generation. For this reason, there are measures established to enable the dissemination of know-how in these areas to both public and private operators.

45. The actions aimed at creating greater collaboration between public and private stakeholders were considered as the most important elements of the proposed CEAP. The 47 proposed actions were indexed with the help of an impact factor calculated based on five criteria: environmental impact; technical and economic feasibility; alignment with regulation and policies; scalability; and stakeholders' interest. While greater collaboration between public and private stakeholders was ranked highest, the impact indexes associated with the various actions showed little difference between them, and many actions have the same impact factor. This result is explained by linkages and temporal coordination between the actions themselves.

46. The proposed CEAP considers the best practices on municipal solid waste management developed at the international level and selected and adapted set of measures and actions to the Croatian context. However, some actions, to be implemented, require the approval of several amendments to the Construction Law and the Waste Management Law, and a revision of the mandates and competences assigned to each entity involved in the implementation of the CEAP and currently based on the Law on Organization and Scope of State Administration Bodies (Official Gazette 85/2020). The adoption of these changes requires specific negotiations with the different institutions and agencies and needs additional time, which may limit the achievement of effective results within the timeframe initially envisaged for the implementation of the CEAP. For these reasons, the proposed measures and actions, are presented according to their applicability within the existing legislative framework and considering the current mandate of the implementing bodies. The Government of Croatia may adopt a gradual approach in the implementation of the CEAP, starting with measures for immediate implementation and postponing the application of those actions that require the modification of the legal framework. It is important to underline that the full implementation of the CEAP will be necessary for an advanced transformation of the CDW value chain into a circular economy model. The proposed vision for Croatia is to be a country with a mature circular economy model, and a consistent and compliant legislative framework being above EU average level of CDW recovery and waste generation rate in 2030 in the CDW sector.

47. As regards governance aspects of the CEAP, it suggests setting up a Steering Committee to oversee roadmap progress, support the MoESD during enforcement, promote cooperation among stakeholders, and identify synergies and funding opportunities. Members are to be selected by the MoESD, including public and private representatives from the CDW sector such as government departments, and construction and waste management companies.

48. Croatia today is at a crossroads: the increasing production of CDW caused by the urbanization process and new infrastructures, if properly addressed, can present an opportunity to move the building sector and CDW value chain in the direction defined by the Circular Economy Package. This CEAP, developed with the contributions of all the stakeholders in the CDW value chain, has the ambition to define the measures to capture this opportunity.

5. Communication and Collaboration

49. This chapter describes the support provided to the MoESD in identifying key stakeholder groups and communication activities, channels, audiences, and content, with the aim to improve stakeholder cooperation and information-sharing, as well as CE literacy related to waste management among the general public to meet the EU recycling targets and accelerate the country's CE transition. Circular Economy involves many sectors and stakeholders and requires increased coordination and active communication among key target audiences: government, businesses, civil society, academia, and the media through an interdisciplinary dialogue. Such a multiple stakeholder environment often creates a challenge common to all countries: how develop a common understanding and speak in one voice. This chapter presents the approach chosen within the context of the RAS, which is detailed in the RAS deliverable [Proposed Circular Economy Communications Plan](#).

Box 4 – Strengthening MoESD's communication capacities

The project provided continuous support to the MoESD in developing their communications capacities through creating project subpage on both MoESD ([Featured Topics](#) section) / [World Bank](#) websites (where all the project materials were made available to the public); producing social media content/Facebook campaigns²⁴ (using the existing social media: [World Bank Croatia Facebook](#) and [Country Manager's Twitter](#) channels); MoESD website content²⁵ (news articles), placing media interviews²⁶; writing blogs²⁷, creating educational infographics²⁸ and other supporting visuals and where possible linking it with international environmental protection days, and similar to gain the momentum.

5.1 Stakeholder Engagement²⁹

50. The national CE stakeholder mapping identified relevant stakeholders and confirmed that closer cooperation is needed to move towards a CE.³⁰ The stakeholder mapping served to identify and segment main CE sectors and players in Croatia to help prioritizing capacity building measures. In Croatia, these include the MoESD, Environmental Protection and Energy Efficiency Fund, regional and local governments, municipal waste companies, product manufacturers, Croatian Chamber of Economy (HGK) as well as other sectoral ministries like the Ministry of Agriculture, Ministry of Physical Planning, Construction and State Assets, Ministry of Finance, and many more³¹, as shown in Figure 6. As shown, the stakeholders with highest interest – like NGOs and academia, and even some line ministries – lack significant political or other influence or power to introduce reforms, while the stakeholders with the highest influence to enact solid waste management reforms - such as industry (businesses) or consumers (general public, business entities at large)- somehow lack interest and motivation for action, or even political will to introduce measures or investments that the CE requires. This mapping help inform the communications plans and helped to determine membership of the CEC. The points most often raised by stakeholders are summarized in Box 5.

²⁴ See Facebook campaign on Textile Waste: <https://www.facebook.com/worldbankcroatia/posts/1540670709687176>; <https://www.facebook.com/worldbankcroatia/posts/1558505787903668>. also: SOCIAL MEDIA ACTIVITIES IMPACT REPORT (MARCH 2022): [Circular Economy in the Textile Sector in Croatia](#) (FB paid campaign overview).

²⁵ See MoESD website: [Transition to a Circular Economy in the Construction and Demolition Waste Sector in Croatia](#) (30/3/2022)

²⁶ See interview with Sanja Radović (MoESD) placed ahead of CEAP preparations: [Radović: Construction Waste a Priority Sector for Circular Economy Transition](#) (HINA, 10/7/22)

²⁷ See World Bank's Eurasian Perspectives blog pages placing opinion articles of interest: [Rethinking waste: How a circular economy can help Croatia achieve a more sustainable future](#) (28/3/2022).

²⁸ See [Annex 7](#): Project Visual Identity and Branding, Educational Infographics

²⁹ Select examples of priority stakeholder engagement activities could be found in [Annex 6](#), and a detailed list in the Proposed CE Communications Plan (Chapter 6: CE Communications Action Plan).

³⁰ [Stakeholder Overview](#) (part of Activity 2.1 National Stakeholder Engagement and Coordination (Task 1), April 2021). See also CE Communications Plan, Chapter 2: Stakeholders and Target Audiences.

³¹ For a comprehensive presentation of stakeholders, see Stakeholder Overview, ANNEX I: Key Stakeholders for Introducing the Circular Economy Solutions in Waste Management, and ANNEX II: Priority Sector Stakeholders per Key Product Value Chain in the CE Communication Plan.

51. The Proposed CE Communication Plan covers the period between 2020-2023, including the implementation of the project activities (2020-2022). It includes an awareness and behavior change campaign *Circular Croatia* envisaged to take place over a period of one year (end 2022 - end 2023), corresponding with the adoption of the new NWMP at the beginning of 2023. The Plan proposes two sets of activities: (1) stakeholder engagement activities, and (2) nationwide awareness-building campaign activities, with the aim to strengthen commitment to and interest in recycling, innovative CE technology, and sustainable production and consumption among both key institutional stakeholders, such as national and local authorities and the private sector, as well as the general public. Stakeholder Mapping and Stakeholder Survey on CE, conducted ahead of the Plan preparation, were instrumental in identifying the membership of the Circular Economy Committee, suggest their roles and responsibilities, as well as in informing the work undertaken for other activities under the RAS³².

Circular Economy Committee

52. One of the key instruments for improving stakeholder collaboration the creation of a CE Committee, an advisory body to the MoESD established under the RAS. The CE Committee (CEC) was successfully initiated to facilitate the development of a long-term vision and institutional mechanism for mainstreaming the CE in waste management. Led by the MoESD, the CEC currently includes 19 members from 14 organizations and professional associations representing the public and private sectors, academia, and civil society. The Committee aims to facilitate Croatia's CE transition and achieve the EU waste management / recycling targets, as an entity that will remain in effect well beyond the project's lifetime. Its main goal is to serve as a vehicle for coordination, innovation, knowledge management and communication. In between October 2021- October 2022 the CE Committee met four times³³. The Committee provided sectoral guidance and advice on CE, and participated in implementing project activities, such as capacity building trainings and knowledge exchange study visits (see **Annex 5** on Capacity Building), stakeholder consultations on drafting the CE Action Plan for Construction and Demolition Waste. The Committee is chaired by elected MoESD representatives in this mandate.³⁴

Box 5 – Results of stakeholder engagement process

All of the stakeholder engagement activities carried out throughout the project, including the: survey on CE, consultations on construction waste and capacity building activities (for Capacity Building see **Annex 5**) - proved that continuous information, knowledge sharing and collaboration between the public authorities, the business, consumers and civil society, academia and the media is of utmost importance for successfully adopting the circular economy practices. Communication about circular solutions/benefits to business and citizens was considered particularly important to promote a more sustainable development in Croatia. This was also necessary in view of the reportedly low level of environmental education, information, and awareness of the Croatian public/consumers. Lack of education and information seem to be the greatest gap, barrier / enabler of CE transition also for the private sector stakeholders, which clearly indicates the need for continuous capacity building and training.

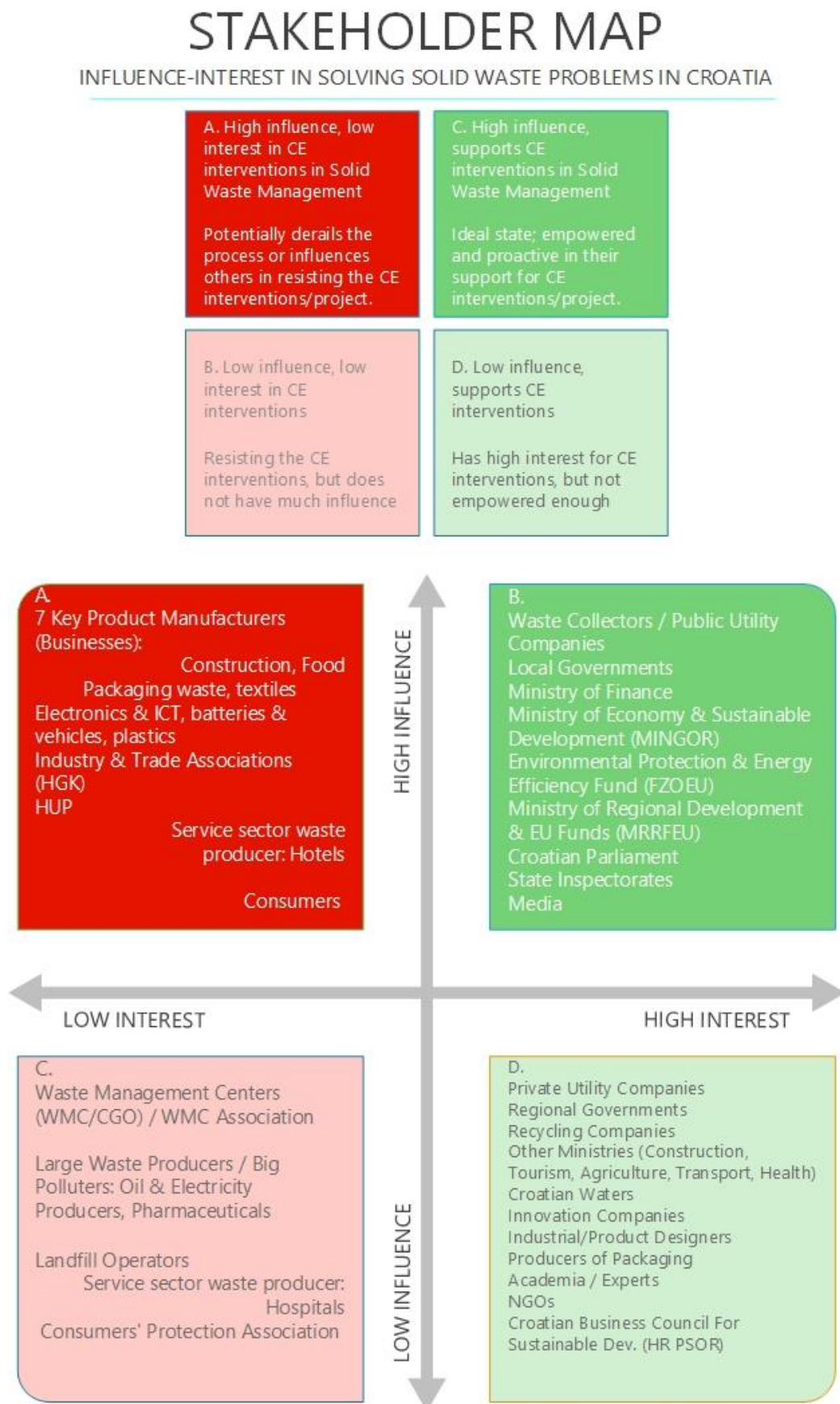
The involvement of stakeholders would also be instrumental in the future for the development of regulations and standards, and the construction sector (as focus sector) should be involved in the formulation of realistic and implementable measures related to that sector.

³² See CE Communication Plan for Stakeholder Mapping and Survey Results (subchapters: 1.4.1: *Stakeholder Survey on Circular Economy*, and 2.1: *Stakeholder Mapping*).

³³ See the MoESD website: [First Session of Croatia's Circular Economy Committee Takes Place](https://www.mo.esd.hr/en/first-session-of-croatia-s-circular-economy-committee-takes-place) (18/10/2021).

³⁴ See Facebook post: <https://www.facebook.com/worldbankcroatia/posts/1500312363723011>.

Figure 6 – Influence-Interest matrix of stakeholders in solid waste management in Croatia



5.2 Awareness Raising and Behavior Change

53. The current NWMP 2017-2022 calls for the implementation of a public awareness-raising campaign aiming to increase the CE literacy of consumers (citizens) and businesses by educating the general public about the unsustainable quantities of waste disposed in landfills, their harmful impact to the people and the environment, and the benefits of adopting CE practices. Such a nationwide awareness-raising campaign is proposed as a means for knowledge sharing, communications, and consultations for all CE-related activities, which could also serve to support the work of the CE Committee. The campaign could be supported and supervised by the CE Committee by providing guidance on the campaign messaging and activities³⁵ (see Annex 6 for examples of 10 priority activities from the Plan).

Messaging and Branding

54. To achieve the objectives of the nationwide awareness-building campaign, certain overarching messaging are proposed for targeted communication outreach (Box 6). It used the results of the Stakeholder Survey on Circular Economy and the analysis of the coverage of CE and waste management issues in the media³⁶. Furthermore, aiming to appeal at the institutional and individual levels, while being relatable and actionable, overarching messaging was developed to be integrated into and reinforced by a creative visual identity adapted from the Project logo shown in Figure 7.

Box 6 –Overarching messaging for targeted communication outreach (in English and Croatian)

English	Croatian
Campaign headline: #NO TIME TO WASTE. ³⁷	<i>Naziv kampanje: #ZA BACANJE NEMA VREMENA.</i>
Primary message (slogan): Turn Things Around – Choose well. Make it last. Recycle. ³⁸	<i>Ključna poruka (slogan): Napravi zaokret u životu – pažljivo biraj, koristi dulje, recikliraj. / NEKA STVARI KRUŽE, DA NAM DUŽE SLUŽE.³⁹</i>
Secondary message (reinforcing the slogan): Close the circle, regenerate nature. We share the same world.	<i>Razrada ključne poruke (sekundarna poruka): Zatvori krug, podrži prirodu. Dijelimo isti život i svijet.</i>

³⁵ The proposed Communication Plan provides a menu of specific interventions and stakeholder engagement and communication activities, including those undertaken as part of the CERCLE project, targeted to different audiences to maximize and measure their effectiveness in reaching and engaging the target audiences.

³⁶ See CE Communication Plan, subchapters: 1.3: *Waste Management Communication in the Media* and 1.4.1: *Stakeholder Survey on Circular Economy*.

³⁷ *No Time To Waste* headline was inspired by the recent James Bond movie *No Time To Die* (hr. *Za smrt nema vremena*). We believe that this wordplay could potentially appeal to the audiences and represents a solid base for creative advertising for the communications campaign.

³⁸ Evidence shows that the majority of people relate CE primarily with Recycling (see CE Stakeholder Survey).

³⁹ This slogan is effective in Croatian because it rhymes. Literal translation would be: *Circulate products (things), for them to serve us longer.*

Figure 7 – Adapted project logo and tagline for the *Circular Croatia* campaign



LOGO TAGLINE:
For climate resilient Croatia
Za klimatski otporniju Hrvatsku

55. **The proposed messaging encourages target audiences to take action and change their habits.** The goal is to promote behavior change, both through positive and negative argumentation (pointing to the advantages, benefits of the CE transformation, and consequences if things remain unchanged). A future campaign to raise public awareness needs to be carefully designed and implemented based on the proposed strategic Communications Plan taking into account the impact of waste management on public health and environmental pollution and the need to inform the public about CE infrastructure investments, interventions, and changed practices.

56. **The project visual identity was created with inputs from the MoESD and includes project logo and web banner (Annex 7).** These visuals have been developed to be easily adapted for use/replication in the *Circular Croatia* campaign. The logo already contains a recognizable Croatian national symbol – a square combined with the infinity symbol illustrating circularity. Used on the [project webpage](#) on the World Bank’s and on [MoESD’s](#) websites, the web banner illustrates the main CE phases (from design, production and use) and waste management priorities (from waste prevention and reuse to recycling).

Box 7 – Social Media Campaign using educational infographics

The project also created content for 12 educational infographics (Annex 7) used in social media outreach (Facebook, Twitter)⁴⁰. The topics covered four priority sectors (food, textile, plastics, construction waste) and Circular Economy issues in Croatia in general. A total of 72 Facebook and Twitter posts were published in between 2020-2022, reaching over 93,000 users. Two Facebook campaigns were created using the infographics (with 2 posts each – one highlighting the issue, and the other offering a CE solution), for: (1) Circular Economy in the Textile Sector⁴¹; and for (2) Food Waste and Circular Economy Solutions in the Agri-Food Sector⁴². Infographics on the Textile Waste alone reached over 36,000 users (those who have seen the posts); users engaged with the posts close to 700 times (clicked on the link, liked, commented, shared), commented 71 times, and shared 69 times (among them media outlets and academia).

Creating news with infographics triggered media to use and share such content, as in the case of Construction Waste infographics⁴³. The ready-made infographics can also be used in creating awareness-raising promotional material (brochures, leaflets), presentations, reports, and in a variety of informational products. Application of these infographics in social media outreach can be consulted in the [Proposed Circular Economy Communications Plan \(2022\)](#) (ANNEX V) available on [World Bank Croatia](#) and [MoESD](#) websites, and were published on WB Croatia Facebook pages as part of the continuous social media outreach: FB channel [@worldbankcroatia](#) and WB Croatia Country Manager’s personal Twitter account [@j_arulpragasam](#).

⁴⁰ See CE Communications Plan, ANNEX V: Circular Economy Social Media Outreach

⁴¹ See WB FB posts on Textile Waste:

- Post 1: <https://www.facebook.com/worldbankcroatia/posts/1540670709687176>

- Post 2: <https://www.facebook.com/worldbankcroatia/posts/1558505787903668>

⁴² See WB FB posts on Food Waste:

- Post 1: <https://www.facebook.com/worldbankcroatia/posts/1578529502567963>

- Post 2: <https://www.facebook.com/worldbankcroatia/posts/1590648474689399>

⁴³ See: [Ekovjesnik.hr: Construction and Demolition Waste a leading industry sector in quantities of waste](#) (30/3/2022); and HTV’s (Croatian National Television) [Eko-Zona](#) environmental TV show: <https://www.facebook.com/ekozona.hrt.hr/posts/10166412078265480> (1/4/2022). WB FB post on Construction Waste:

- Post 1: <https://www.facebook.com/worldbankcroatia/posts/1481221255632122>

- Post 2: <https://www.facebook.com/worldbankcroatia/posts/1567957193625194>

- Post 3: [CEAP for CDW presentation to CE Committee members](#)

Target Audiences

57. A condensed list of **top five target audiences** was created for immediate communication activities.

- (1) **Governance** (decision makers and governing actors)
- (2) **Businesses** (private sector – industry and trade; waste management companies; business associations)
- (3) **Science/academia** (university researchers, professors, students)
- (4) **General Public** (citizens and businesses as consumers/users, represented through NGOs, civic initiatives/activists, social cooperatives).
- (5) **Media** (mediator and actor – journalists and media associations)

How to address the general public, in particular the Youth and Women is described in Box 8.

Box 8 – Target Audiences in Focus (from the CE Communication Action Plan)

My Place in the Circle: Youth as Agent of Change

Children and youth (young kids, adolescents, university students) are one of the key target audiences for CE communication. They are the new champions of circularity in their families, communities, schools, future workplaces. Future generations are ready to change and be responsible. Youth and School as an “anchor” for communication around Circular Economy could be the focus of a specific campaign targeting them. In coordination with the Ministry of Science and Education it is recommended to create awareness campaigns in kindergartens and schools; include a circular segment in their environmental curricula, that could be developed by MoESD.

My Place in the Circle: Women as Agents of Change

Women can be key drivers of change, as consumers and as decision-makers. Women already provide a large amount of informal and sometimes unpaid work related to waste management. Surveys⁴⁴ show that women: (1) tend to be more sustainable consumers and are more sensitive to ecological, environmental, and health concerns; (2) are more likely to recycle, minimize wastage, buy organic food and eco-labelled products, and engage in water and energy savings initiatives at the household level; and (3) place a higher value on energy-efficient transport and in general have a higher preference for public transport than men. It is recommended that a specific campaign targets women on sustainable consumption / reuse, and household waste minimization and prevention.

CE Communication and Collaboration Platform

58. **Circular platforms⁴⁵ and knowledge networks can accelerate CE transition by sharing knowledge, highlighting case studies and facilitating collaboration.** It is proposed that such a platform be developed for Croatia. It could be a virtual web-based tool or a physical forum of stakeholders along the lines of the CE Committee, or a mix of the two, with the virtual supporting the physical. The proposed platform would ensure the visibility of the CE concepts and could contribute to their faster adoption by individuals and businesses. The project developed a Terms of Reference for the interactive design and IT development of the proposed platform (see ANNEX IV of the Proposed CE Communications Plan). The structure and sitemap hierarchy of the digital platform are shown in the Visio illustration⁴⁶.

⁴⁴Source: OECD, 2021 in [UNECE \(United Nations Economic Commission for Europe\): Towards a gender responsive Circular Economy](#) – The challenges and opportunities for standardization

⁴⁵ A good example is <https://circulareconomy.europa.eu/platform/>

⁴⁶ CE Platform Sitemap: <https://app.box.com/s/58nts6z0zivxb44dhf31mw7fp3ll8> (English); <https://app.box.com/s/mua49eg0q0gpw13xnc3er3lsr4rzar2r> (Croatian)

6. Conclusions and Next Steps

59. This RAS provided assistance to the Government of Croatia in mainstreaming CE approaches in its solid waste management policies. Key outputs included a review of the current CE and waste policy landscape, a material flow analysis (MFA), the identification of priority sectors for the CE transition, the development of a CE Action Plan for the Construction and Demolition Waste (CDW) sector, recommendations for the revision of the current and development of the new National Waste Management Plan, as well as communication and capacity building activities. Already during RAS implementation, results have informed the revision of the NWMP 2017-2022, adopted by the Government in December 2021.

60. The Government needs to move ahead with finalization and adoption of the post-2022 NWMP, which is informed by this RAS, followed up by its implementation. The outputs of this RAS need to be viewed in the context of the new National Waste Management Plan 2023-2028 that is being prepared and utilized as inputs to that plan. The availability of the proposed CEAP for CDW can help the Government showcase its intent on CE but will need to ensure that the framework for its implementation is in place. Adoption of the CEAP and its implementation will help cement the Government's commitment to the CE agenda and signal further alignment with the EU directives and EU CEAP.

61. The template of the proposed CEAP for CDW could be used for developing other CEAPs for key sectors such as plastics. A robust methodology for developing CEAPs has been developed under this RAS, which can be applied to other sectors. This will help integrating CE aspects in the management of other major waste streams, in line with the present and future NWMP and the EU's WFD, Green Deal and CEAP. Plastics may be prioritized for the development of a CEAP, given its importance in marine litter that can lead to adverse impacts on marine ecosystems and the tourism sector – a sector of vital importance to the Croatian economy.

62. Further work could also focus on integrating CE principles into municipal waste management in coastal regions. In 2018, waste produced by tourists accounted for 9 percent of total MSW in Croatia. As tourism in Croatia is concentrated in areas along the Adriatic coast, 96 percent of total tourist waste is generated in seven counties along the sea, where waste generated by tourists accounts for almost 20 percent of annual generated MSW, a large proportion of which is still landfilled.

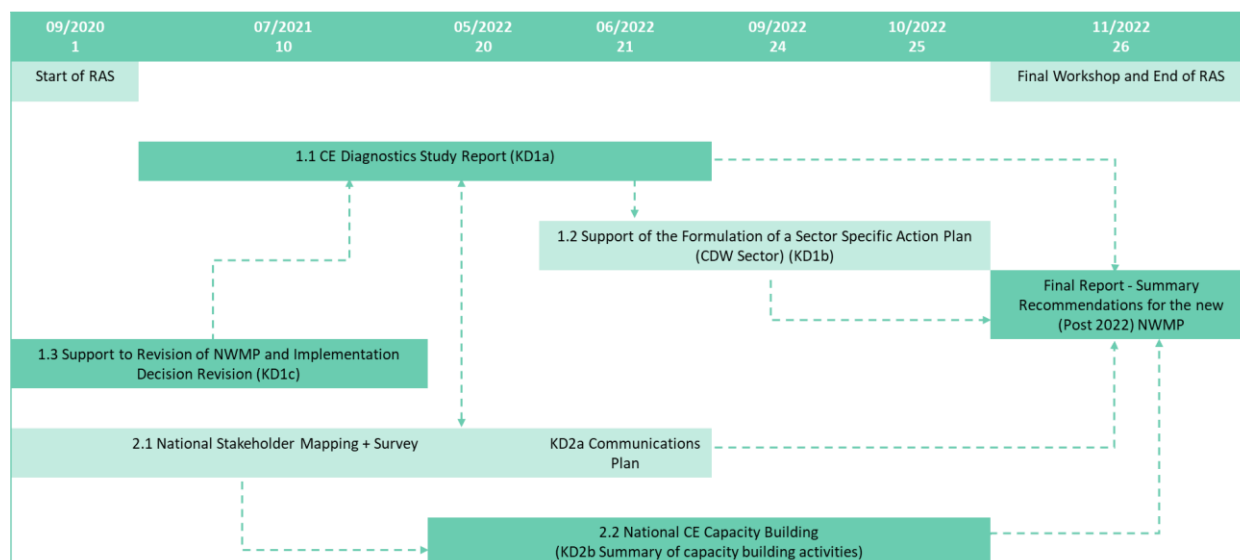
63. The RAS has also helped create the first ever CE Committee in Croatia, a multistakeholder mechanism to drive the CE agenda forward in Croatia. The CE Committee can serve as collaboration mechanism that can continue to guide the further development of the CE agenda in Croatia. The Government can consider formalizing its role and providing the CE Committee with tools and support to execute its role more efficiently and effectively. The RAS developed the Terms of Reference for an IT enabled digital platform that could be developed as an aide for the CE Committee to further communication and collaboration.

64. The implementation of the CE agenda in waste management will require significant financing, some of which may need to be leveraged from external sources. Sources of financing for implementation in waste management are typically limited to the government budget, the energy and environment fund under the MoESD, and the EU. The EU is moving away from supporting landfilling (landfilling to be max 10 percent of total MW generated by 2035) and will only finance CE-related investments in the new programming period. While Croatia has initiated efforts to move away from building landfills to regional waste management centers (WMCs; a total of 11 WMC are planned of which only 3 have been built) in the current programming period, it will need financing for WMCs that the EU will not finance. Given that each WMC costs around EUR 80 million, there can be a significant gap in financing to be filled. In addition, undertaking sector specific action on CE like the implementation of the CEAP for CDW is estimated at EUR 120 million. Other external sources like IFIs could be potential sources for filling the funding gap and ensuring that the waste management infrastructure is well aligned with the EU CEAP and waste framework directives.

7. Annexes

Annex 1. Structure and Resources of the Reimbursable Advisory Services project

Figure 8 - Structure of RAS including key deliverables and timeline



Note: Arrows represent contributions of deliverables to following activities.

RESOURCES CROATIA: CIRCULAR ECONOMY APPROACHES IN SOLID WASTE MANAGEMENT

The below section provides an overview of all deliverables and outputs of the RAS, including links to the final version of each of them.

COMPONENT 1: CIRCULAR ECONOMY

ACTIVITY 1.1: Diagnostic Analysis for a Circular Economy in Croatia

- [Circular Economy Diagnostic Analysis](#) (May 2022)
ANNEXES:
I: [Assessment of Croatia’s Policy Landscape Regarding Circular Economy](#)
II: [Comparative Analyses on Resource Circulation of Slovenia and Croatia](#)
III: [Identification of the Focus Sector / Value Chain](#)
IV: [Material Flow Analysis for Circular Economy](#)
V: [International Good Practices and Policy Recommendation](#)
VI: [Report on Stakeholder Consultation and Draft Capacity Building Program](#)

ACTIVITY 1.2: Support to Formulation of a Sectoral Circular Economy Action Plan

- [Proposed CE Action Plan on Construction and Demolition Waste](#) (November 2022)

ANNEX 1:
[Proposed CE Action Plan on Construction and Demolition Waste - Priority Measure Analysis](#) (July, updated November 2022)

ACTIVITY 1.3: Support to Revision of National Waste Management Plan (2017-2022) and Implementation Decision

- [Inputs to National Waste Management Plan \(2017-2022\) and Implementation Decision Revision](#) (June 2021)

BOOK OF ANNEXES:

I: [An Overview of EU and National Waste Targets](#)

II: [An Overview of Additional Requirements that MS Waste Management Plans and Waste Programs have to Include According to Directive 2018/851](#)

III: [Annex IV of the Directive 2008/98/EC – Examples of Waste Prevention Measures Referred to in Article 29 and Waste Prevention Measures Defined by Article 9 of the Same Directive](#)

IV: [NWMP and NWMP ID Implementation Status and Evaluation Results](#)

V: [Determining the Amount of Reusable Waste for Sizing Reuse Centers](#)

VI: [Separate Collection and Treatment of Dry Recyclables and Biowaste](#)

VII: [Description of EU Funds / Programs](#)

VIII: [Analysis of Compliance of the NWMP Content \(including WPP\) with the Requirements Defined by EU Legislation](#)

IX: [Priority Areas for Investment Pipeline Activities in the Waste Sector Transition to Circular Economy](#)

COMPONENT 2: STAKEHOLDER COORDINATION AND CAPACITY BUILDING

ACTIVITY 2.1: National Stakeholder Engagement and Coordination

- [Proposed Circular Economy Communication Plan](#) (May 2022)

ACTIVITY 2.2: National Capacity Building

- [Summary of Capacity Building Programs](#) (October 2022)

TRAININGS ON CIRCULAR ECONOMY IN CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

Six training sessions in Zagreb, Rijeka, Varaždin, Osijek, Split and Dubrovnik (23 May – 1 July 2022):

1. [Series of Circular Economy in Construction and Demolition Waste capacity building trainings](#)
Vladimir Kalinski, The World Bank Croatia
2. [Circular Economy in the EU and Croatia – An Overview](#)
Darko Bizjak, Environment Agency Austria (EAA)
3. [Construction and Demolition Waste in the context of CE in Croatia and approaches along the value chain](#)
Mihail Asenov, EAA
4. [Concept, barriers, and enabling conditions for the implementation of circular design of buildings](#)
Mihail Asenov, EAA
5. [Sustainable criteria in the construction process – the experience of Austria](#)
Thomas Kasper, PORR Recycling GmbH
6. [Requirements for issuance of building permits or in public procurement. Best practices from the Netherlands](#)
Mihail Asenov, EAA

7. [Introduction to measures to increase recycling content in buildings and products](#)
Mihail Asenov, EAA
8. [Overview of EU and Croatian legislation on recycling and recyclability status of construction and demolition waste](#)
Darko Bizjak, EAA
9. [Closing the loop of materials in the construction and demolition waste sector. Recycling yards and permits in Austria](#)
Martin Car, Austrian Construction Materials Recycling Association (BRV)
10. [Green Public Procurement as policy measure for CDW in a circular economy - Concepts, the process of procuring construction works along the value chain, and documentation and verification procedures](#)
Mihail Asenov, EAA
11. [Introduction to measures for CDW management at its end of life](#)
Mihail Asenov, EAA
12. [Overview of EU and Croatian legislation on landfilling with focus on construction and demolition waste](#)
Darko Bizjak, EAA
13. [Construction and Demolition-Waste: End of life, recycling possibilities and landfilling restrictions in Austria](#)
Tristan Tallafuss, Austrian Construction Materials Recycling Association (BRV)
14. [Guidelines for waste audits before demolition and renovation of buildings](#)
Mihail Asenov, EAA

WEBINARS ON SELECTED CIRCULAR ECONOMY TOPICS

Webinar I:

Preparing a Circular Economy Strategy - the experience of Austria

[6 May 2022]

1. [Circular economy in the EU: an overview](#)
Ulrich Kral, Environment Agency Austria
2. [Preparing a circular economy strategy. The example of Austria](#)
Brigitte Karigl, Environment Agency Austria
3. [Stakeholders' involvement in the preparation of the circular economy strategy in Austria](#)
Brigitte Karigl, Environment Agency Austria
4. [Insights from the preparation of a Croatian Circular Economy Action Plan on Construction and Demolition Waste](#)
Francesco Loro, Global Factor

Webinar II:

Strengthening the Reuse of Products and Reuse Centres in Croatia

[12 July 2022]

1. [European Reuse Landscape](#)
Matthias Neitsch, RREUSE network - RepaNet Austria
2. [Reuse in Croatia \(Razvoj modela ponovne uporabe proizvoda i centara za ponovnu uporabu u Hrvatskoj - available in Croatian\)](#)

Ivan Božić, HUMANA NOVA Croatia

3. [Waste Management and Reuse centers in the region of Flanders](#)
Eddy Wille, OVAM - Public Waste Agency, Flanders region, Belgium
4. [Re-use network and centers in Belgium](#)
Jolien Roedolf, HERWIN, Flanders, Belgium
5. [Enhancing reuse collection](#)
Berthold Schleich, Arge Abfallvermeidung GmbH – Waste Prevention Association, Austria
6. [End-of-waste for re-usable products](#)
Maximilian Wagner, RepaNet Austria

Webinar III:

Management of Plastic Packaging and Single-Use-Plastics in the EU and Croatia: Legislation, policies and best practices

[13 September 2022 – IN PREPARATION]

1. [The need for sustainable management of plastic packaging and SUP in the EU](#)
Reinhold W. Lang, Johannes Kepler University Linz
2. [Extended producer responsibility \(EPR\) for plastic packaging and SUP in EU legislation: A brief overview](#)
Mikhail Asenov, Environment Agency Austria (EAA)
3. [Management of plastic packaging and SUPs in Croatia: Current status and outlook](#)
Gordana Pehcec Pavlović, Croatian Chamber of Economy (HGK)
4. [Development of the EPR system on packaging waste in Austria](#)
Dieter Schuch, Altstoff Recycling Austria
5. [Prevention and management of plastic packing waste in Lithuania](#)
Dainius Kazlauskas, Environmental Projects Management Agency, Lithuania
6. [Management of marine littering: Policies, strategies and actions](#)
Neil James – Environmental Research Institute, University of the Highlands and Islands (UHI), UHI North Highland, Scotland (UK)

STUDY TOURS

1. [Slovenia Study Tour Report](#)

[2-3 June 2022]

2. [The Netherlands Study Tour Report](#)

[3-6 July 2022]

Annex 2. Performance against the EU targets and National Waste Management Plans targets

Report “Support to Revision of National Waste Management Plan (2017-2022) and Implementation Decision” was prepared in July 2021, based on available data at time. For the purpose of Final Report summarized results of performance against EU targets were updated by latest available data.

Table 2 – Performance of the Croatian waste sector against the EU targets

EU directive	Target date	Target	Reference year	Rate (in %)	Indicator	
Waste Framework Directive (2008/98/EC)	December 2020	Prepare for re-use and recycling 50%, by weight, at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households (calculation method 2 ⁴⁷).	2021	31	Not achieved	
	December 2020	Prepare for re-use, recycling and material recovery, including backfilling operations using waste to substitute other materials, 70% by weight, of non-hazardous construction and demolition waste, excluding naturally occurring material defined in category 17 05 04 (natural soils and stone).	2020	60	Not achieved	
Packaging and Packaging Waste Directive (94/62/EC)	From 31st December 2008	60% as a minimum by weight of packaging waste will be recovered or incinerated at waste incineration plants with energy recovery.	2021	51	Not achieved	
		Between 55 % as a minimum and 80 % as a maximum by weight of packaging waste will be recycled.	2021	51	Not achieved	
		The following yearly minimum recycling targets for materials contained in packaging waste should be attained:				
		(i) 60% by weight for glass.	2021	55	Not achieved	
		(ii) 60% by weight for paper and board.	2021	82	Achieved	
		(iii) 50% by weight for metals.	2021	27	Not achieved	
		(iv) 22,5% by weight for plastics, counting exclusively material that is recycled back into plastics.	2021	36	Achieved	
(v) 15% by weight for wood.	2021	16	Achieved			
End of Life Vehicles Directive (2000/53/EC)	01/01/2015	Reuse and recovery to a minimum of 95% by average weight of vehicle and year.	2021	97.28	Achieved	
		Reuse and recycling to a minimum of 85% by average weight of vehicle and year.	2021	97.97	Achieved	
Batteries Directive (2006/66/EC)	26/09/2016	Minimum 45% collection rate for batteries & accumulators.	2021	74	Achieved	
	26/09/2011	Recycling processes shall achieve the following minimum recycling efficiencies: (a) recycling of 65 percent by average weight of lead-acid batteries and accumulators, including recycling of the lead content to the highest degree that	2021	83	Achieved	

⁴⁷ From 4 available calculation methods stipulated by Commission Decision 2011/753/EU, Croatia chose calculation method 2 which applied to paper, plastic, glass and metal waste (the amount of these fractions recycled and the amount of these fractions produced are put in relation)

EU directive	Target date	Target	Reference year	Rate (in %)	Indicator
		is technically feasible while avoiding excessive costs.			
		(b) recycling of 75 % by average weight of nickel-cadmium batteries and accumulators, including recycling of the cadmium content to the highest degree that is technically feasible while avoiding excessive costs; and	2021	79%	Achieved
		(c) recycling of 50 % by average weight of other waste batteries and accumulators.	2021	86%	Achieved
Landfill Directive (1999/31/EC)	31 December 2020	Biodegradable municipal waste going to landfills must be reduced to 35% of the total quantity (by weight) biodegradable municipal waste produced in 1997 (264.661 t).	2021	594.107 t (79% of quantity in 1997)	Not achieved
	From 2019	The minimum collection rate 65 % of the average weight of EEE placed on the market in the three preceding years. ⁴⁸	2021	55%	Not achieved
	From 15/8/2018	For Temperature exchange equipment - 85 % shall be recovered - 80 % shall be prepared for re-use and recycled	2021	97% 95%	Achieved
	From 15/8/2018	For Screens, monitors, and equipment containing screens having a surface greater than 100 cm - 80 % shall be recovered - 70 % shall be prepared for re-use and recycled	2021	92% 92%	Achieved
	From 15/8/2018	For Lamps - 80 % shall be recycled	2021	83%	Achieved
	From 15/8/2018	For Large equipment (any external dimension more than 50 cm) - 85 % shall be recovered - 80 % shall be prepared for re-use and recycled	2021	95% 95%	Achieved
	From 15/8/2018	For Small equipment (no external dimension more than 50 cm) - 75 % shall be recovered - 55 % shall be prepared for re-use and recycled	2021	89% 89%	Achieved
	From 15/8/2018	For Small IT and telecommunication equipment (no external dimension more than 50 cm) - 75 % shall be recovered - 55 % shall be prepared for re-use and recycled	2021	89% 89%	Achieved

⁴⁸ From 2019, there are two offered targets on separate collection, i.e.. two calculation methods:
65% - the ratio of collected quantities and average quantities of EE equipment placed on the market in the previous three years
85% - the ratio of collected quantities and quantities of EE waste produced in one year.
RC chose the first (1) calculation method as more favourable.

Report “Support to Revision of National Waste Management Plan (2017-2022) and Implementation Decision” was prepared in July 2021, based on available data at time. For the purpose of this Report summarized results of performance against NWMP targets were updated by latest available data.

Table 3 – Performance of the Croatian waste sector against the NWMP targets

NWMP target	Target	Reference Year	Rate (%)	Indicator
NWMP target 1.1	Reduce total quantity of produced municipal waste by 5% (1.571.222 t)	2021	1.766.560 t (12.42% more than targeted)	Not achieved
NWMP target 1.2	Separately collect 60% by weight of the produced municipal waste (primarily paper, glass, plastics, metal, bio-waste, etc.)	2021	43	Not achieved
NWMP target 1.3	Separately collect 40% by weight of the produced municipal biowaste	2021	25	Not achieved
NWMP target 2.1	Separately collect 75% by weight of the produced construction waste	2020	60	Not achieved
NWMP target 1.4	Dispose at landfill less than 25% of produced municipal waste	2021	58	Not achieved

Annex 3. Proposal of timeline for implementation of National Waste Management Measures

Table 4 – Proposed timeline for implementation of NWMP measures for NWMP 2017-2022 and NWMP 2023-2028

NWMP measure	Proposed deadline
Measures that are implemented and should not continue in the next planning period	
M 1.2.4. Introducing quantity-based fees for collection and treatment of mixed and biodegradable municipal waste	-
M 1.4.6. Energy recovery planning	-
M 2.2.1. Preparation of action plan for the use of residual sludge from wastewater treatment facilities on suitable surfaces	-
M 2.5.1. Establishing a waste ship management system	-
M 4.1. Creating a Plan for closing non-hazardous waste landfills	-
M 7.2. Analysis and redefining supervision jurisdiction in waste management	-
M 8.1 Improving the system and procedures for issuing waste management permits	-
Measures to be excluded from the scope of NWMP	
M 1.3.1. Development of quality and categorizing criteria for compost and digestates	-
M 7.1. Educating all the participants in waste management supervision	-
M 2.5.2. Identifying the locations of wrecks and sunken objects on the seabed and creating a cadaster.	-
M 2.5.4. Remediation of wrecks and sunken objects on the seabed in ownership of the RC.	-
M 2.5.5 Intervention remediation of wrecks and sunken objects on the seabed and their contents	-
M 2.5.3. Identifying the composition and quantities of hazardous matter and explosive material in wrecks and sunken objects on the seabed which pose the threat of polluting the marine environment or making the sea resource use an unsafe process.	-
Measures that should be finished by the end of this planning period (2017-2022)	
M 3.1. Analysis of existing and necessary capacities for hazardous waste treatment	2021
M 4.3. Identifying new locations polluted by hazardous waste ("hot spots")	2021
M 1.4.1. Introducing a fee for landfilling	2022
M 2.1.1. Creating an action plan for separate collection and recycling construction and demolition waste	2022
M 2.3.1. Improvement and analysis of the existing packaging waste management system	2022
M 2.6.1. Improving the medical waste management system	2022
M 2.6.2. Conducting an asbestos waste estimation study for each county	2022
M 2.6.4. Improving the special categories of waste management system (end-of-life vehicles, waste batteries and accumulators, waste tires, EE waste, oils)	2022

NWMP measure	Proposed deadline
M 6.2. Creating an EPEEF information system for the preparation and implementation of projects	2022
Measures that should be continued in the next planning period (2023-2028)	
M 1.2.1. Procurement of equipment, vehicles and vessels for separate collection of paper, cardboard, metal, plastic, glass and textile	2023
M 1.4.3. Intervention measure to decrease landfilling municipal waste generated in the City of Zagreb	2023
M 1.4.4. Intervention measure to decrease landfilling municipal waste generated in the City of Split	2023
M 5.1. Creating a Program of educative-informative activities on sustainable waste management	2023
M 1.2.2. Constructing a sorting facility for separately collected paper, cardboard, metal, glass, plastic etc.	2025
M 1.2.3. Construction of recycling yards	2025
M 1.3.2. Procurement of equipment and vehicles for separate collection of bio-waste	2025
M 2.6.3. Construction of landfill cells for asbestos waste	2025
M 6.1. Creating and/or improving applications that are part of the waste management information system	2025
M 1.4.5. Constructing waste management centers	2026
M 2.1.2. Constructing and procuring equipment for recycling yards for construction and demolition waste	2026
M 1.1.1 Measures defined by the Waste Prevention Plan	2028
M 1.1.2. Establishment of re-use centers	2028
M 1.1.3. Home composting	2028
M 1.2.5. Strengthening the market for waste intended for recycling	2028
M 1.2.6. Constructing recycling facilities	2028
M 1.3.3. Construction of facilities for biological treatment of separately collected bio-waste	2028
M 1.4.2. Monitoring the amount of biodegradable waste in mixed municipal waste	2028
M 2.2.2. Establishing a sludge management system	2028
M 2.4.1. Identifying the locations and sources of marine waste and identifying locations of accumulated marine waste on the seabed	2028
M 2.4.2. Establishing a system of prevention, collection and disposal of marine waste, as an integral part of the waste management system in the RC.	2028
M 2.4.3. Intervention collection and disposal of marine waste.	2028
M 2.4.4. Establishing cooperation with neighboring or other countries regarding marine waste pollution.	2028
M 4.2. Remediation of non-hazardous waste landfills	2028
M 4.4. Remedying locations polluted by hazardous waste ("hot spots")	2028
M 4.5. Remediation of abandoned waste locations.	2028

NWMP measure	Proposed deadline
M 5.2. Conducting activities from the Program of educative-informative activities on sustainable waste management	2028
M 5.3. Conducting a national campaign on sustainable waste management	2028

Table 5 - Summarized results of implementation progress of NWMP ID activities for the period 2017-2020

No.	NWMP target	NWMP sub-target	NWMP sub-target name	Progress of NWMP ID activities
1.	Improvement of municipal waste management system	Sub-target 1.1	Reduce total quantity of produced municipal waste by 5%	>50%
		Sub-target 1.2.	Separately collect 60% by weight of the produced municipal waste (primarily paper, glass, plastics, metal, bio-waste, etc.);	<50%
		Sub-target 1.3	Separately collect 40% by weight of the produced municipal biowaste	<50%
		Sub-target 1.4	Dispose at landfills less than 25% of produced municipal waste	<50%
2.	Improvement of the system for management with special waste categories	Sub-target 2.1	Separately collect, by weight, 75% of the produced construction waste	0%
		Sub-target 2.2	Establish system for sludge waste management from wastewater treatment plants	50%
		Sub-target 2.3	Improve the packaging waste management system	0%
		Sub-target 2.4	Establish waste management system for marine litter	50%
		Sub-target 2.5	Establish waste management system for waste ships, wrecks and sunken things on the seabed	<50%
		Sub-target 2.6	Improve waste management system of other special waste categories	0%
3.	Improvement of hazardous waste management system	Sub-target is not defined by NWMP		0%
4.	Remediate sites contaminated with waste	Sub-target is not defined by NWMP		<50%
5.	Continuously carry out educative-informative activities	Sub-target is not defined by NWMP		>50%
6.	Improve the waste management information system	Sub-target is not defined by NWMP		>50%
7.	Improve supervision of waste management	Sub-target is not defined by NWMP		50%
8.	Improve administrative procedures in waste management	Sub-target is not defined by NWMP		100%

Note: Detailed results are provided in Annex 4 - NWMP and NWMP ID implementation status and evaluation results of the report

Annex 4. Summary on seven priority areas for investment pipeline activities in the waste sector

STRENGTHENING WASTE PREVENTION

65. The first pillar of the most preferred approach to waste management is not to create it in a first place, followed by ensuring the re-use and high recycling rate as a major goal of sustainability efforts. For fostering behavioral change to achieve sustainable resource and waste management, besides an appropriate regulatory framework, awareness and sensitization activities are of high importance. It is essential that the public is properly informed and educated to understand what transition from linear to circular economy approach is, how this will be conducted in Croatia, what are the financial requirements for incorporating circular economy principals.

66. For successful implementation of waste prevention measures, a combination of regulatory, economic, technical and communication mechanisms is required. Under this priority area investment pipeline activities should include targeted actions to radically alter patterns of consumption and production for example by applying educational and information tools and incentives like, investments in public awareness raising, motivating consumers to change their consumption patterns towards sustainable consumptions and a return to traditional consumption patterns to include reduce reuse, repair.

67. A comprehensive communication strategy represents a good tool for planning investments under this priority area. Important is that this strategy includes communication activities with public not only regarding the waste prevention but of all aspects of “circular waste management”. To understand importance of sustainability and waste prevention, how they can gain from it and how their role is crucial for its success, it is important that public is adequately informed and educated regards waste separation, planned sorting and recycling technologies but also projects and costs of treatment of residual waste within waste management centers.

IMPROVEMENT OF PREPARATION FOR RE-USE AND RECYCLING

68. This investment area generally includes investments in following activities:

- infrastructure for separate collection (biowaste, plastic, paper, metal, construction and demolition waste, textile, etc.);
- re-use and recycling infrastructure
- projects/programs for innovations in production;

69. Further, investments in separate collection system and re-use and recycling infrastructure is necessary to ensure transition to circular economy in waste management and ensuring achievement of EU waste management targets. To shift from waste disposal as a main waste treatment option and to push waste management toward re-use and recycling require efficient waste collection system and sufficient waste recycling capacities. This requires continuing with investments regarding the development of re-use network, system for separate collection and treatment of waste (e.g. investment in construction of re-use centers, recycling yards, equipment for waste collection like vehicles and waste bins, sorting capacities for dry recyclables, facilities for biological waste treatment and facilities for recycling of dry recyclables).

70. To have efficient re-use and recycling but also resource efficient management investments in production efficiency innovations are necessary. Investments plans in different programs and projects that will stimulate innovation in the waste sector by highlighting future trends and opportunities for growth in the circular economy through design and technological development and increased resource efficiency should be developed (e.g. different types of eco-innovations related to conception and design of product, process, organizational, marketing, social, etc.).

71. For planning investment for this area, it is of crucial importance to ensure proper planning of the waste management system. Waste separation model which takes into account environmental but also economic viability, national re-use and recycling needs and consequently capacities should be determinate prior investments planning.

ESTABLISHMENT OF MANAGEMENT SYSTEM FOR MARINE LITTER

72. Marine litter is gaining growing attention at EU level and marine litter management is incorporated in a range of strategic documents and directives (e.g. European Green Deal, Directive on Single Use Plastic Products, etc.).

73. Current NWMP defines measures regarding marine litter management yet comprehensive action plan by which more precise definition and prioritization of action needed is provided. It would be reasonable to prepare national Action Plan on marine litter. This type of Action Plan should clarify issue of competent authorities', defined exact measures, needed investments and deadlines. Prior preparation of Action plan assessment on marine litter sources, quantities etc. (analytical work) should be conducted as a background for defining measures/activities within Action plan.

ENSURING ECONOMICALLY AND ENVIRONMENTALLY SOUND MANAGEMENT OF RESIDUAL WASTE

74. Treatment of residual waste is planned within WMC. Two out of 11 planned WMC are constructed while for the other project preparation process is ongoing (projects are at different stage of project preparation, for certain feasibility studies are under preparation, while for certain public procurement process is currently conducting). In general projects are at a high level of completeness when it comes to project preparation process.

75. The current EU waste management legislation does not necessitate change in the concept for treatment of residual waste in Croatia. In accordance with the Landfill Directive by 2035 the amount of municipal waste landfilled have to be reduced to 10 percent or less of the total amount of municipal waste generated (by weight). Yet, to be sure that planning and dimensioning of system for residual waste is environmentally and economically efficient it is recommended to prepare Material Flow Analysis on the state level. These analyses should take into account new waste package goals and existing situation to determinate expected residual waste up to 2035. Accordingly, investment pipeline should be prepared including residual waste treatment plants and/or landfill cells to overcome needs.

IMPROVEMENT OF HAZARDOUS WASTE MANAGEMENT SYSTEM

76. Although share of hazardous waste accounts 3 percent of the total waste generated in Croatia its proper management is of great importance from environmental aspect and from human health aspect. EU legislation calls for ensuring separate collection for hazardous waste fractions produced by households.

1. Currently in Croatia hazardous waste is mainly pre-treated and exported from country or after stabilization disposed at landfills and when it comes for collection system difficulties are identified (e.g. collection packaging containing remains of hazardous substances is not well established).
2. Based on the results of implementation of NWMP measure which envisage preparation of feasibility study with analysis of existing and needed capacities for hazardous waste treatment, further activities and investment should be defined in more details.

REMEDIATION OF WASTE POLLUTED SITES

77. This generally includes investments in following measures:

- Remediation of existing non-compliant landfills;
- Remediation of dump sides (wild landfills);
- Remediation of hot spots.

78. Implementation of these activities are of great importance for protection of human health and the environment but also present conditions that Croatia accepted by signing EU Accession Treaty (closure of all landfills that are not in compliance with EU requirements).

IMPROVEMENT OF WASTE MANAGEMENT INFORMATION SYSTEM

79. EU Member States must record and report on their waste management activities in order to comply with various binding targets relating to aspects of waste management. This requires reliable, relevant and consistent data to be provided to the European Commission. Furthermore, ensuring accurate and comprehensive waste data is important for strategic planning and setting goals, for decision making, and monitoring of the performance in waste management and achievement of the targets.

80. Waste Management Information System in Croatia is currently scattered, consisting of various information databases that are often not linked with each other. This represents an administrative burden for both the competent authorities and the taxpayers who are obliged to report in Waste Management Information System (e.g. causes double reporting of the same sets of data in different databases). Changes in EU waste legislation bring new, additional requirements and challenges regarding monitoring and reporting and in general EU society is moves forwards digitalization. Therefore, investment in digital transformation of waste management information system and integration of existing digital applications on a joint IT waste management platform is important waste sector investment area.

Annex 5. Capacity Building Program

81. The following annex describes the capacity building program, as outlined in detail in the RAS output “[Summary of Capacity Building Programs](#)”. Training programs⁴⁹ were organized in cooperation with the [Environment Agency Austria \(EAA\)](#). Specific target groups were identified to formulate recommendations for future capacity building programs, which are summarized in Table 6 below.

Table 6 –Proposed training topics for identified target stakeholders

TARGET STAKEHOLDERS	TRAINING TOPICS
Decision makers	Regulatory and policy framework to implement CE in CDW
Waste inspectors	Best practices and useful tools for development of inspection plans for controlling CDW management operators and enforcing of CDW related legislation
Construction permitting authorities; Construction supervisors	Regulatory and policy framework to integrate circular economy approaches in urban planning and permitting of construction works
Construction and demolition investors	Regulatory and policy framework, costs and benefits of applying CE approaches in construction sector, existing recycling infrastructure and technologies
Construction designers	Design For Circularity – concept, good practices, standards and legal framework
Construction and demolition companies	Sustainable construction and renovation - good practices, standards and legal framework
CDW management operators	CDW recycling infrastructure GPP and performance-based contracts
Producers of construction materials	Sustainable design and production of building materials
Construction products market surveillance authorities	Implementation of the legal requirements for marketing of construction products
Tax authorities Aggregates extractors CDW management operators	Sustainable sourcing of raw materials for production of construction products
Standards developers	Standards and technical specifications as drivers for increasing the market demand for recycled CDW
Users and civil society representatives	Sustainable use and maintenance of buildings

Trainings on CDW

82. Six in-person two-day training programs on *Circular Economy and Sustainable Construction and Demolition Waste (CDW) Management*⁵⁰ were organized in six Croatian cities (regional centers). They were attended by a total of 94 participants, and implemented over the period of May – July 2022, with the following [calendar of events](#):

- Zagreb (23-24 May)⁵¹
- Rijeka (25-26 May)⁵²

⁴⁹ All the training materials, including the Capacity Building Report, developed under the CE RAS are made available on MoESD website ([Featured Topics](#) section), and on the World Bank Croatia project pages: [Circular Economy Approaches in Solid Waste Management](#).

⁵⁰ See MoESD website news article: [Cycle of trainings on circular economy and sustainable construction and demolition waste management launched.](#)

⁵¹ See also WB social media posts about the training in Zagreb:

- <https://www.facebook.com/worldbankcroatia/posts/160552034320221>;

- <https://www.facebook.com/worldbankcroatia/posts/1604954616592118>.

⁵² See also WB social media post: [Training on CE in construction in Rijeka.](#)

- Varaždin (6-7 June)⁵³
- Osijek (8-9 June)⁵⁴
- Split (28-29 June)⁵⁵
- Dubrovnik (30 June-1 July)⁵⁶

83. The training [agenda](#) provided an overview of some of the best practices in circular (construction) waste management, with examples from Austria and the Netherlands and their applicability to the Croatian context. The lectures were divided into three thematic blocks: (1) Circular design of buildings, (2) Increasing the recycled content share in construction products, and (3) Construction and demolition waste end of life (end-of-waste criteria) and landfilling restrictions. The lecturers were environmental experts from the Environment Agency Austria, experts from the construction company PORR from Vienna; and Austrian Building Materials Recyclers Association (BRV). The training brought together: construction material producers, recyclers of CDW, industry associations, NGOs, research institutes, and national and local authorities responsible for circular economy and CDW management. However, most participants came from the private sector, which can be interpreted as a clear sign of interest from the CDW private companies in increasing their know-how and capacity to adopt more circular approaches.

84. The discussion and Q&A sessions highlighted that re-using and recycling materials and components from buildings are by far the topics participants were most interested in. Still, several barriers hamper the full development of the sector. The available quantity, quality, and supply of recyclable CDW in Croatia are insufficient to adequately meet the requirements and supply of the secondary raw material. The lack of regulatory framework, implementation of policy measures and practices, and administrative capacity were ranked as the most important barriers hindering the proper development of the sector. Practices such as illegal landfilling and dumping of CDW, a common practice in Croatia, were often mentioned as barriers as they decrease the availability of recycled materials and pose environmental risks. These gaps often trigger a lack of willingness from investors to finance projects utilizing recycled materials.

85. During the training, some measures seemed particularly promising to fill the gaps and boost CE in the CDW sector in Croatia. Regulatory measures such as standards for construction materials and CDW would significantly increase the use of more sustainable construction materials and support the development of circular approaches in CDW. The introduction of a landfill tax, end-of-waste criteria, and tax on raw materials, and standards for construction and recycled materials were ranked as priority measures.

86. The results from this educational activity were used to formulate recommendations for the current and forthcoming national efforts on improving the CDW management, including the development of a Circular Economy Action Plan for CDW (Activity 2.1) and the upcoming new Waste Management Plan 2023-2028.

Webinars on Circular Economy

87. Three webinars on selected circular economy topics were organized from May to September 2022. Topics were chosen by MoESD from the proposed set of 11 potential topics:

- Webinar I⁵⁷: Preparing a Circular Economy Strategy - the Experience of Austria (6 May 2022)

⁵³ See also WB social media post: [Training on CE in construction in Varaždin](#).

⁵⁴ See also WB social media post: [Training on CE in construction in Osijek](#).

⁵⁵ See also WB social media post: [Training on CE in construction in Split](#).

⁵⁶ See also WB social media post: [Training on CE in construction in Dubrovnik](#).

⁵⁷ See also WB social media (Facebook) post: Webinar on: [Austria's experience in creating the Circular Economy Strategy](#).

- Webinar II⁵⁸: Strengthening the Reuse of Products and Reuse Centers in Croatia (12 July 2022)
- Webinar III⁵⁹: Management of Plastic Packaging and Single-Use-Plastics in the EU and Croatia: Legislation, policies and best practices (13 September 2022)

88. One of the main outcomes from all webinar discussions highlighted the need to bring stakeholders together to discuss potential or proposed policies; and to promote the knowledge-sharing and training of stakeholders and practitioners with targeted training programs. The Austrian experience in preparing the Circular Economy Strategy was timely in light of preparing the upcoming Croatia's Circular Economy Action Plan (CEAP) for CDW. During the discussions, the issue of the measurability of CE indicators and the availability of data were discussed, as well as institutional setup and responsibilities for collecting CE-related information needed for tracking the implementation of the CEAP. It was suggested that in addition to waste management and environmental protection authorities, statistical and other authorities that regulate the production, service, and construction sectors also be involved.

89. Strengthening the re-use of items and expanding the network of re-use centers in Croatia is identified as one of the most significant waste prevention measures in the current Waste Management Plan of the Republic of Croatia (2017-2022). In learning about the establishment of re-use centers and waste prevention activities in Austria and Belgium (Flanders region), Croatian counterparts expressed concerns about the best way of organizing and financing social entrepreneurship as part of the circular economy. The Flemish experts explained that mutual integration of environmental protection, social inclusion and job creation policies, collaboration with different departments, appropriate taxation, and establishment of functional collection systems are crucial in addressing these challenges.

90. The topic of plastic packaging and single-use-plastics (SUP) management, and challenges and opportunities of implementing EU plastic waste legislation in Croatia - proved to be the most popular among the three webinars, attracting over 100 participants online. Good practice examples on Extended Producer Responsibility (EPR) schemes for plastic packaging from Lithuania and Austria, confirmed the general opinion that EPR is an excellent and vital instrument. However, the public may have concern that producers may pass down the costs to the consumer. The discussion also highlighted the importance of energy transition to renewables to achieve circular transition (due to the interconnectedness between material and energy). In order to address the packaging that cannot be recycled, the CE policy mix should include a combination of recycling and incineration with energy recovery.

Exposure to International Good Practice

91. Two study visits to EU member states, renowned for their successful implementation of CE have taken place in June and July 2022. The study tours were primarily targeted at the members of the CE Committee. Relevant governmental, local governments and businesses were invited, and the study trips were implemented as follows:

- Ljubljana, Slovenia⁶⁰. (2-3 June 2022);
- Amsterdam, The Netherlands⁶¹ (3-6 July 2022).

92. [Slovenia Study Visit](#): The aim of the study visit was to engage with stakeholders from Slovenia and to learn about governmental and private sector led circularity initiatives in Slovenia, visit exemplary facilities, and exchange circular business experiences. The program was developed in cooperation with the Slovenian Ministry of Environment and Physical Planning and the Government Office for Development and European Cohesion Policy of the Republic of Slovenia. The Slovenian government's efforts at

⁵⁸ See also WB social media post: [Webinar on Reuse](#)

⁵⁹ See also WB social media post: [Webinar on Plastic Waste](#)

⁶⁰ See also WB social media post: [Study visit to Slovenia](#).

⁶¹ See also WB social media posts:

- [Study visit to the Netherlands](#) (post 1)

- [Study visit to the Netherlands](#) (post 2)

maximizing the use of EU funds towards CE stood out in sharp contrast to Croatia and offered a possible clue to why and how Slovenia has raced ahead on circularity. Other reasons include the enabling national policy framework for CE and ongoing support being provided by the government. However, it also was evident that circularity can make business sense and provide good returns on investments for the public and private sectors. The important role of communications, coordination, and collaboration across stakeholders was also one of the key take away's from the study visit.

93. **The Netherlands Study Visit**: CE Committee members visited leading examples of circular city development in Amsterdam to learn about key strategies and approaches for managing solid waste and transiting to the circular economy in the Netherlands, in view of collecting best practices which could be applied to the Croatian context. The program was developed in cooperation with the [Amsterdam Chamber of Commerce](#). The study trip helped participants understand the benefits of upcycling, where waste is used as a resource for producing new items, including in construction of new buildings. Communication about circular solutions/benefits to business and citizens was considered important to promote a more sustainable development in Croatia. This was also necessary in view of the reportedly low level of environmental education, information, and awareness of Croatian consumers.

Annex 6. Selected Stakeholder Engagement and Communication Activities from the CE Communications Action Plan

(Chapter 6 of the Communication Plan)

Table 7 - 10 selected stakeholder engagement and communication activities from the CE Communications Plan

Communication Activity	Description	Responsible Stakeholder	Target audiences	Timeline
Stakeholder Engagement Activities ⁶²				
Stakeholder consultations on Construction and Demolition Waste (priority sector) ⁶³ – in person and online	Discussions informing the 5-year CE Action Plan for C&D sector in Croatia 2023-2027	MoESD / World Bank	Governance ⁶⁴ Businesses Academia NGOs CE Committee	March-July 2022
Capacity building specialized trainings (in-person and online) for key CE stakeholders on selected topics (C&D waste, Austria CE Strategy, Reuse Centers, Plastics Waste, etc.) ⁶⁵	Invited speakers: renowned scientists, successful LGs, businesses, foreign/external speakers	MoESD / World Bank	Governance Businesses Academia NGOs CE Committee Media	May – September 2022
International good practices: Case studies of the Netherlands and Slovenia	Study visits - discovering practical examples of the circular economy in the Netherlands and Slovenia	MoESD / World Bank	CE Committee	June-July 2022
CE Committee regular sessions (at least quarterly) ⁶⁶	Regular CE Committee meetings on: Rules of Engagement, CE platform development, amendments to the WM Law, etc.	MoESD / CE Committee	CE Committee	Last Session (3): April 2022 – ongoing (continuous)
Presentation of CE Action Plan for C&D waste + Recommendations for the new National Waste Management Plan 2023-2028	Public presentation of the key takeaways from the 2 strategic documents / CERCLE project wrap-up conference	MoESD / World Bank	Governance CE Committee Media	November 2022
Awareness and Behavior Change Campaign Activities ⁶⁷				

⁶² Listed Stakeholder Engagement Activities were delivered during the project implementation.

⁶³ See news article on MoESD website: [Transition towards a circular economy in the Construction and Demolition Waste management sector in Croatia](#) (30/3/2022). News was also reposted by [Ekovjesnik.hr](#) and HTV's [Eko zona](#) environmental TV show.

⁶⁴ Decision makers and governing actors: Ministry of Economy and Sustainable Development (MoESD); FZOEU Fund; other relevant ministries: construction, agriculture, tourism, transport, health, education; counties; cities and municipalities; Croatian Parliament; political parties.

⁶⁵ See news articles (MoESD website): [Start of a series of trainings on circular economy and sustainable management of construction and demolition waste](#) and Association of Cities webpages: [Sustainable \(construction\) waste management trainings](#).

⁶⁶ See social media post (World Bank FB pages): <https://www.facebook.com/worldbankcroatia/posts/1586075225146724>.

⁶⁷ Listed Awareness and Behavior Change Campaign Activities are to be delivered end 2022/2023, beyond project lifetime.

Set up of the Communication and Collaboration Platform - Cirkular.hr	Circular Croatia knowledge hub and user portal for citizens, businesses, local authorities	MoESD/CE Committee	CE Committee General Public Governance Businesses Science Media	Start: Autumn/Winter 2022/23 – Launch: Earth Day 2023 (22 April)/World Env. Day (5 June)
Conduct a national survey(s) ⁶⁸ to analyze the existing behaviors at the household level + industry level.	Survey on socially unacceptable measures (e.g. mixed municipal waste/landfill taxation), incl. awareness on waste reduction, reuse, recycling (3 Rs) on the local level.	MoESD / CE Committee	General Public Governance Businesses Academia Media	Autumn/Winter 2022/23
#NoTimeToWaste – Circular Croatia awareness and behavior change campaign (print/online, TV, radio, social media) with information /educational content intended for the wider public	National Media / Advertising Campaign Concept, visual identity, campaign copy (title, main messages). [to be outsourced to a marketing agency]	MoESD / CE Committee	General Public (NGOs, social cooperatives, citizens) Governance Businesses Science Media	Start: End 2022 End: End 2023
Media placement: Placing stories, interviews ⁶⁹ , features, opinion editorials, blogs ⁷⁰ , etc., thematic TV and radio shows, speakers on: - national media (TV, print/digital/social media) - local media (radio, print/digital/social media)	Media channels: national media focus on raising awareness and educating the public; local media promote local best practice examples. - Print / digital / SM (national/local): dedicated column; newspaper insert; - TV (national - HTV): new or existing show (i.e.. for children) - Radio (local level)	MoESD / CE Committee	General Public Governance Businesses Science	Spring 2022 – End 2023 (continuous)

⁶⁸ Public opinion surveys are a useful communication tool, for evaluating and measuring the success of the implemented activities and their eventual correction.

⁶⁹ See interview with Sanja Radović (MoESD) placed ahead of CEAP preparations: [Radović: Construction Waste a Priority Sector for Circular Economy Transition](#) (HINA, 10/7/22)

⁷⁰ See World Bank's Eurasian Perspectives blog pages placing opinion articles of interest: [Rethinking waste: How a circular economy can help Croatia achieve a more sustainable future](#) (28/3/2022). Such blogs could be placed in the Croatian media (if / when appropriate) as opinion editorials ('columns').

<p>What a Waste! / A što s otpadom? – Edu campaign for pre-school and school children and youth</p>	<p>Info-edu campaign in coop. w/ Ministry of Science & Education targeting: kindergartens; elementary & high schools; on current situation and desired CE goals in the waste sector (but also in production, use/consumption, reuse and recycling) in their env. curricula. Children in return educate their parents.</p>	<p>MoESD / CE Committee / Ministry of Science and Education</p>	<p>General Public Governance Businesses Media</p>	<p>Start: Academic year 2022/2023</p>
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Annex 7. Project Visual Identity and Branding, Educational Infographics

CERCLE Project Logo



CERCLE Visual / Web Banner



CERCLE Educational infographics

EDUCATIONAL INFOGRAPHICS

THE WORLD BANK

Transition Towards a Circular Economy

Croatia
2.7% circular
97% of all MSW

Goals

- Eliminate waste
- Extend product lifetime
- Regenerate nature

Global economy
8.6% circular
91.4% of all MSW

What can we do?

- REFUSE
- RETHINK
- REDUCE
- REUSE
- REPAIR
- REPAIR
- REMANUFACTURE
- REPURPOSE
- RECYCLE

Achieving European targets in closure of landfills and recycling

Municipal waste landfilling rate*

EU targets for municipal waste recycling

2020: 55% (Croatia), 42% (EU average)
2025: 10% (Croatia), 55% (EU average)
2030: 10% (Croatia), 65% (EU average)
2035: 10% (Croatia), 70% (EU average)

Municipal waste recycling rate*

2020: 34% (Croatia), 45% (EU average)
2030: 48% (Croatia), 65% (EU average)

Construction and Demolition Waste Sector and its Footprint in Croatia

21% of total material consumption

13% of total greenhouse gas emissions

32% of total waste generated

Close to 1 billion EUR of value creation

Circular Economy in Construction and Demolition Waste Sector in Croatia

Quantities of waste

Largest quantities

City of Zagreb and coastal counties

32% of total waste

30% increase of construction waste treated in 2020, compared to 2015

60% recovery rate in 2020

Food Waste in Croatia

Households and the business sector produce close to 290,000 t of food waste annually in Croatia

71 kg per person

EU produces about 88 million t of food waste per year

40% of that food waste is edible

76% of total food waste produced

53% of total food waste produced

60% is edible

Food Waste in Croatia

Circular economy solutions for the food sector

- Procure local fresh produce and animal products for consumption
- Implement surplus food distribution networks aimed to food retail, hotels, and restaurants
- Effective separate collection and processing of bio-waste
- Scale up the production of biofuels from bio-waste

Tips for households

- Plan your menu and purchase accordingly
- Know the difference between 'use by' and 'best before'
- Freeze or share leftover food
- Grow your own fruits and vegetables
- Check the food stock before you go shopping

Textile Waste Management

40% increase in the volume of purchased clothing per person

25 kg of clothes each year

20 kg of textile and garments each year

25% of textiles recycled

95% of household textile waste is collected separately

90% is disposed in landfill

Textile Industry and Textile Waste in Croatia

Circular Economy Solutions

- Reinforce eco-design of durable, reusable, and recyclable textile
- Ensure the necessary infrastructure for separate collection and recycling
- Increase separate collection of household textiles
- Stimulate second-hand market platforms, reuse networks, and repair services

Textile Sector Footprint*

Textile material consumption: 1.6 mil t

Emits about 0.80 mil t of CO₂

Final value of textile production: 450 mil EUR

Croatian potential: 59% of textile waste could be recycled

PLASTICS MATERIAL FLOW

Croatia: 37% recycling rate

Europe: 42% recycling rate

Landfill: 25%

Recycling: 33%

Energy recovery: 43%

DECREASING THE DEMAND for plastic & INCREASING PLASTIC RECYCLING is essential for the transition to a circular economy, given the long period of degradation of most plastic.

It is crucial to PREVENT and vigorously REDUCE PLASTICS that end up IN THE OCEANS AND GLASS.

PLASTIC WASTE IN CROATIA

22.9% of domestic waste in Croatia

Solutions for stimulating refuse, reuse and recycling of plastic waste:

- Ban single use plastics starting with tourist locations and the food service industries
- Substitute plastic packaging with 100% recyclable, bio-based alternatives
- Improve take back schemes for plastic packaging

Croatia's Material & Carbon Footprint

Resources consumption* and greenhouse gas emissions of four priority sectors**

Sector	Material consumption	Financial value creation	Greenhouse gas emissions	Waste generation
Food	19.4 million tons	€4.8 billion	6.3 million tons CO ₂ e	1.93 million tons of waste
Construction	35% of total material consumption	11% of total gross value added	23% of total GHG emissions	35% of total waste generated*
Plastics				
Textiles				