

Croatia Circular Economy Approaches in Solid Waste Management (P173141)

ACTIVITY 1.1: Diagnostic analysis for a Circular Economy in Croatia

Task 6: Report on stakeholder consultation and draft capacity building program

(Annex 6)



CIRCULAR ECONOMY
APPROACHES IN
SOLID WASTE
MANAGEMENT

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Abbreviations

%	per cent
ADEME	Environment and Energy Management Agency of France
BMI	Building Information Modeling
CDW	Construction and Demolition Waste
CE	Circular Economy
CEA	Croatian Employers' Association
CEC	Circular Economy Committee
CEAP	Circular Economy Action Plan
CHE	Croatian Chamber of Economy
EDM	Environment Data Management
EEA	Environment Agency Austria
e.g.	exempli gratia (for example)
EMAS	Eco-Management and Audit Scheme
EPEEF	Environmental Protection and Energy Efficiency Fund
EPD	Environmental Product Declaration
EPR	Extended Producer Responsibility
etc.	<i>et cetera</i> (and so on)
EU	European Union
GAP	General Tax on Polluting Activities
GHG	Greenhouse Gas(es)
GPP	Green Public Procurement
HGK	Croatian Chamber of Commerce (Hrvatska gospodarska komora)

kn/t	Croatian kuna/ton
ISO	International Organization for Standardization
LCA	Life cycle analysis
LCC	Life cycle costing
MoESD	Ministry of Economy and Sustainable Development
MoU	Memorandum of Understanding
MS	Member State (of the EU)
NGO	Non-Governmental Organization
PCR	Product Category Rules
RoI	Return on Investment
SI	State Inspectorate
WB	World Bank
WFD	Waste Framework Directive
WM	Waste Management
WMC	Waste Management Companies

Introduction

Stakeholders' involvement is a crucial step for policy development. During the project, the relevant stakeholders for CE and CDW in Croatia have been identified and involved in a series of activities to gather their input on the proposed policies, current situation in Croatia, as well as barriers and opportunities. Part of the consultation was organized in the form of surveys with the aim to highlight the need for further capacity building and training exercises in Croatia.

Following the stakeholder consultation activities, the objective of this report is two-fold:

- To identify and map the stakeholders in the CDW sector in Croatia;
- To document the stakeholder consultation on the identified priority sector for a circular economy in Croatia, namely construction and demolition waste;
- To draft the activities for the capacity building and training that will be carried out in the next phases of this project on CDW in a circular economy in Croatia.

1 Stakeholder mapping on CDW

In the construction sector, the circular economy approach can be 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 and their value is preserved. Therefore, a wider range of stakeholders is needed, reaching beyond CDW management.

This chapter aims to present the relevant stakeholders for CE of CDW that were identified in Croatia. The table below provides an overview of the identified stakeholders including the national and local institutional level, the private and business sector, and other stakeholders such as academia and NGOs. Also, the newly formed Committee on Circular Economy is briefly introduced. The information was extracted from the report on recycling infrastructure "2019 Annual Report on Recycling Infrastructure for CDW" especially for Agencies and Ministries¹.

¹ MoESD 2019. Annual CDW Management Report in 2019

Table 1: Identified relevant stakeholders for CE and CDW in Croatia

National level: responsible actors in CDW management	
<p>Ministry of Economy and Sustainable Development (MoESD)</p>	<p>The MoESD prescribes CD waste management measures. It is responsible for formulating the national policy on CD waste management as well as for coordinating related ministries that have the portfolio on related matters in the implementation of waste management policy. It determines strategic directions, develops programs and plans for sustainable development of the society on the principle of green and circular economy, including CD waste management and environmental impact assessment activities.</p> <p>The MoESD is responsible for: deciding on applications for permits for waste management related to hazardous waste and for thermal treatment of waste; the application for approval to enter into a contract with the EPEEF to provide treatment of special categories of waste keeping a register of waste management activities and a register of waste importers and exporters and a register of laboratories, by-products and revocation of waste status; and finally for the application for export or import of waste, issues a permit for the organization.</p>
<p>The Ministry of Physical Planning, Construction and State Assets</p>	<p>The Ministry is competent for the circular economy of buildings and space. The Ministry of Physical Planning, Construction and State Property performs administrative and other tasks related to physical planning, construction and housing. It performs administrative and other tasks related to real estate valuation, determination of conditions for design and construction of buildings, energy efficiency in buildings, construction and use permits, use, maintenance and removal of buildings. The Ministry also performs duties related to the effect of economic policy instruments and measures on the development of design services in construction and construction services; business of legal and natural persons in the field of construction, work of the professional chamber of architects and chambers of engineers in construction and physical planning, freedom of movement of construction products and services within the prescribed competence of the Ministry, regulation of requirements for energy-efficient, affordable and sustainable construction, monitoring and analyzing legality and quality construction; monitoring and analyzing the quality of construction and design services in construction; housing, housing policy, construction of apartments and settlements; realization of special programs of the Government in housing construction; policy, monitoring and improving the situation in the communal economy, achieving international cooperation in construction and housing.</p>

	The Ministry is the contact point for construction products.
The Ministry of Health	This Ministry is competent for the implementation of the REACH Directive in Croatia in order to limit the level of toxicity in products.
The State Inspectorate (SI)	The State Inspectorate is a central administrative inspection body. It conducts supervision (inspection) of implementing CD waste management measures. The Environmental Inspection, within the State Inspectorate, performs inspection and other professional tasks related to the application and implementation of laws and other regulations in the field of environmental protection, including waste management.
The Environmental Protection and Energy Efficiency Fund (EPEEF)	<p>The EPEEF is the implementing body for waste management measures. It is established for the purpose of financing the preparation, implementation and development of programs, projects and similar activities in the field of waste management, circular economy, energy efficiency and the use of renewable energy sources.</p> <p>It is responsible for the implementation of economic instruments in waste management, such as waste disposal fee, fee for reducing the quantity of mixed municipal waste, management fee for special waste categories, refundable fee. It manages fees pursuant to the Act on Sustainable Waste Management, such as fees for packaging and packaging waste, waste tires, EE waste, end-of-life vehicles, waste lubricants oils, etc. It is responsible for calculating and collecting the prescribed fees, keeping the Register of management of special waste categories, financing and co-financing projects in the field of waste management, managing the system of collection and treatment of certain special categories of waste for a specific category of waste.</p>
Private and business organization	
Croatian Chamber of Economy (CHE)	<p>The CHE is a professional association of business entities. It encourages and supports affirmative action related to the circular economy in order to raise social awareness of a sustainable natural environment among its members in the economic sectors.</p> <p>The Association for secondary raw materials, collection and processing operates within the Chamber.</p> <p>CHE can provide assistance in establishing contact with the private sector.</p>

The Croatian Chamber of Trades and Crafts	The Croatian Chamber of Trades and Crafts is an independent professional business organization of tradesmen and craftsmen, founded with the aim of promoting, coordinating and representing the joint interests of trade and craftsmanship.
Croatian Chamber of Architects	The Chamber is a legal entity with public authorities. It promotes architecture and the culture of construction, promotes architectural activities in order to protect the public interest.
The Croatian Chamber of Civil Engineers	The Croatian Chamber of Civil Engineers is an independent and autonomous professional organization of certified civil engineers, construction site engineers and construction managers.
The Croatian Employers' Association (CEA)	The CEA is an independent association that represents interests of employers, among others also employers from construction sector.
Regional and Municipality level actors	
Counties and local government authorities	<p>Waste Management Act (OG 84/2021) prescribes obligations of Regional and local government related to CDW management.</p> <p>Local self-government units and the City of Zagreb are obliged to ensure the conditions and implementation of prescribed waste management measures in its area. CDW management has been performed by the publicly-owned utility companies or by private companies that have signed an agreement with the local government.</p>
Association of Counties, Cities and Municipalities	National organization of local and regional authorities.

Public and Private companies	
CDW management companies	Private companies that are dealing with CDW management will be invited to participate in the workshops depending on their regional distribution. A total of about 300 companies have a permit for processing, i.e. pre-treatment, recovery, or disposal of construction waste ² .
Construction sector companies	Emphasis will be given to private companies that are implementing or dealing with innovative approaches in the construction sector.
Academia and NGOs	
Civil Engineering Faculty	Representatives of academia will be invited according to their regional distribution
Faculty of Architecture	Representatives of academia will be invited according to their regional distribution
NGOs	Relevant NGOs will be invited according to their regional distribution. Such as Zelena Akcija/Zagreb), Sunce (Split), Croatia Green Building Council etc.
Inter-ministerial cooperation for circular economy	
Circular Economy Committee (CEC)	<p>At the moment, the leading institution of CEC is the Ministry of Economy and Sustainable Development. The CEC, which is a new body, shall evaluate and consult on possible circular economy measures and actions. In this sense, the Committee could provide support and guidance for the circular transition in the construction sector, as well as coordinate and incentivize the inter- and intra-ministerial collaboration and promote the CE approach in the construction sector.</p> <p>Other relevant institutions and associations could be additionally involved through the CEC, such as representatives of the local and regional government, business associations, chambers of commerce as well as academia experts, civil associations and representatives of private firms that operate in the construction sector.</p>

² MoESD CDW Management Report in 2020.

2 Stakeholder engagement activities

Two specific activities took place within the project:

- An online stakeholders' consultation on CDW in a circular economy;
- A survey on circular economy.

The detail in the next paragraphs.

2.1 Stakeholder meeting

As part of Task 6, stakeholders' consultation was organized in cooperation with the Ministry. The relevant stakeholders were identified and invited to a hybrid meeting, which was planned to be organized with physical participation in the Hrvatske vode company (Croatian Water) premises in combination including additional online attendees. However, due to the Corona-19 virus precautionary measures, the meeting was held completely online. The event took place on 16 November 2021; 8.30-12.30 am. The [agenda of the meeting](#) is presented in Annex 1, while Annex 2 presents the [stakeholders' participation](#) list of the meeting. The following paragraphs are presented:

- Summary of the presentations;
- Results of the interactive voting session; and
- Main outcomes from the discussions and Q&A sessions.

Summary of the meeting and presentations

Opening:

The WB presented a brief description of the project. The first component has three main activities, including:

- Croatia CE Diagnostic Analysis;
- Formulation of Sectoral CE Action Plan;
- National Waste Management Plan (NWMP) and Implementation Decision Revision.

The construction and demolition (CDW) sector was identified as a priority topic for the development of an Action Plan for Circular Economy in Croatia. Thus, a Circular Economy Committee (CEC) was established as a national advisory body on CE topics. Further on, a Communication and Collaboration Platform (CCP) is under development; to share contents, information and best practices on CE in Croatia.

An upcoming component of this project foresees the implementation of capacity building and training activities in Croatia primarily on the CDW topic.

The WB elaborated on the CDW in Croatia. The presentation highlighted that 21% of total material consumption in Croatia comes from CDW, and this covers $\frac{1}{3}$ of all waste. These are significant indicators, why an Action Plan for this waste stream is so relevant and urgently needed. The involvement of stakeholders is of utter importance to enable the conditions for a CE and to reach all sectors, such as the industry, the civil society, and the research and development sector. To achieve good results is not only a national issue but binding targets are also set by the EU in the EU Waste Framework Directive for recycling and recovery of CDW, namely to achieve a target for the preparation

for re-use, recycling and other material recovery, including backfilling, to a minimum of 70% by weight by 2020 (Art. 11, 2b of the EU Waste Framework Directive 2008/98/EC)³.

The MoESD stressed the importance of this project for Croatia and underlined that the project gives a positive outlook for further development in this sector in the country and will lead to a valuable contribution to the environment, its protection and responsible use of (natural) resources.

Snapshot presentation N°1: The Construction Sector in the context of the EU Circular Economy Action plan

The EAA held the first snapshot presentation about the Construction Sector in the context of the EU Circular Economy Action Plan, to provide an overview at the EU level. The EU plan accounts for about 50% of all extracted material, 35% of the EU's total waste generation and 5-12% of total greenhouse gases (GHG) emissions. These figures are comparable to the figures on a national level in Croatia. Material efficiency could save up to 80% of GHG emissions. Five measures are put forward as the most relevant in the EU Circular Economy Action Plan (EU CEAP) and there are two documents that are of relevance in the EU:

- EU Construction & Demolition Waste Management Protocol;
- Guidelines for the waste audits before demolition and renovation works of buildings:
 - facilitate recovery of material;
 - beneficial for reuse and recycling.

Already 10 Member States set obligatory requirements based on this protocol and guideline.

Snapshot presentation N° 2: Circular Economy approaches regarding Construction and Demolition Waste

The EAA experts introduced Circular Economy approaches for Construction and Demolition Waste. Policies for CDW that can be implemented along the whole value chain for CDW include:

- production of building material;
- design for circularity;
- construction;
- use and maintenance;
- renovation; and
- end-of-life.

Different measures are available such as a tax on raw materials and eco-design of construction, which can be especially interesting measures for Croatia. But it also has to be stated that eco-design is – at the moment – exclusively focusing on energy (although EU-wide plans foresee extending this to products including windows, insulation, etc.).

Design for circularity of buildings is facing the challenge that its economic benefits are not visible due to the long life of buildings, because the deconstruction or demolition phase happens decades after the construction of a building. Permitting related to environmental standards which have to be met is

³ Directive 2018/851 of the European Parliament and the Council on amending Directive 2008/98/EC on waste.

an interesting measure. The application for a permit could also reach out to the future and thus might also contain a deconstruction plan (mandatory check by authorities, before issuing a permit).

In the construction phase, there are some possibilities. Construction for circularity in the building sector is neither mandatory nor yet widely applied. This includes building passports and Building Information Modeling (BIM), which also stimulates the reuse and recycling of CDW. Mandatory requirements in this direction are still missing. Green Public Procurement (GPP) could be the way to implement and scale-up mandatory requirements for construction.

Concerning sustainable use and maintenance, performance-based contracting is an interesting instrument to impose requirements on how the building should be maintained and repaired. Concerning the end-of-life phase, there is the need to ensure that the material used in the buildings is also (partly) recycled, as a quality comparable to virgin material could be achieved (e.g. through voluntary certifications).

Concerning the end-of-life phase of buildings, end-of-waste criteria are also interesting, but currently there are no such end-of-waste criteria for CDW. The quantities of CDW are also important. Binding construction/commissioning permits with recycling targets are interesting. There is also a need to boost the market for recycling, e.g., through landfilling taxes (artificially changing the market), or through minimum recycled contents.

Many EU countries already apply these measures, including:

- Tax on raw material (Denmark);
- Environmental performance (Netherlands);
- GPP (Netherlands);
- Selective deconstruction (Austria);
- Landfill tax (already used in most MS);
- EWF criteria (a number of countries).

Snapshot presentation N° 3: The role of Green Public Procurement

The EEA expert presented the role of Green Public Procurement and consequently the use of sustainable material in Croatia. In 2019, around 16% of public expenditures in Croatia were in accordance with the GPP. Consequent implementation of the GPP can reduce costs for business in the long term, reduce the use of resources, mitigate GHG emissions and pollution of the environment. Furthermore, GPP criteria can be easily included in the bidding documents. The EU Directive on Public Procurement⁴ is emphasizing GPP as a key component of the circular economy, also in the construction, maintenance and end-of-life of buildings. There are GPP criteria for roads and office buildings, including insulation equipment. These criteria also target the reduction of the use of resources.

In Croatia, there is the possibility to use GPP – currently voluntary – but became binding in 2021 for the central agency (in the field of office supplies, but not CDW). The waste management plan shows

⁴ Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC.

GPP as a measure and there is a national action plan for GPP up to 2020 with the target to introduce criteria in public bids. Again, criteria for construction have not been developed yet.

There are interesting examples of GPP in CDW from Austria (Öko-Kauf; *remark: literally translated “ecological buying”*), and Denmark (where GPP is used for demolition and reuse of material through selective demolition. Feasibility studies are developed. The impact was that approximately 20,000 bricks have been gathered for further recycling. In Germany, old bricks are used in new buildings, and based on the good experience now these requirements will be extended at the national level.

The information on the CE technical assistance project is available on social media, and links have been shared in the chat: <https://bit.ly/3Hlnw4q>, <https://bit.ly/3qLu5r4>

Voting session and results

A voting session to select the most promising policies was organized during the consultation meeting to allow every participant to express a preference and gather input. The results were immediately shared with the participants to stimulate the discussion.

The voting session was organized with the support of online tools (e.g., BEEKAST). Two questions were formulated:

- Which policy measures do you consider most appropriate to ensure a high level of reuse, recycling and other recovery of construction and demolition waste? (downstream);
- Which policy measures do you think are most appropriate to ensure resource efficiency in the production of construction products, and during the design, construction and operation of buildings? (upstream).

For each question, the participants were given possible answers, among the policy options introduced in the presentations. Each participant was asked to select three answers from the list, in each question. The online tool collected and represented graphically the results from the voting exercise.

The results from the voting evidence a preference for mandatory selective deconstruction and pre-demolition auditing (26,3% of votes), followed by landfill tax (23,7% of votes) concerning downstream measures; and resource efficiency criteria in GPP (43%) and a tax on raw material (24%) concerning upstream measures. The figures below present the full results from the voting exercise.

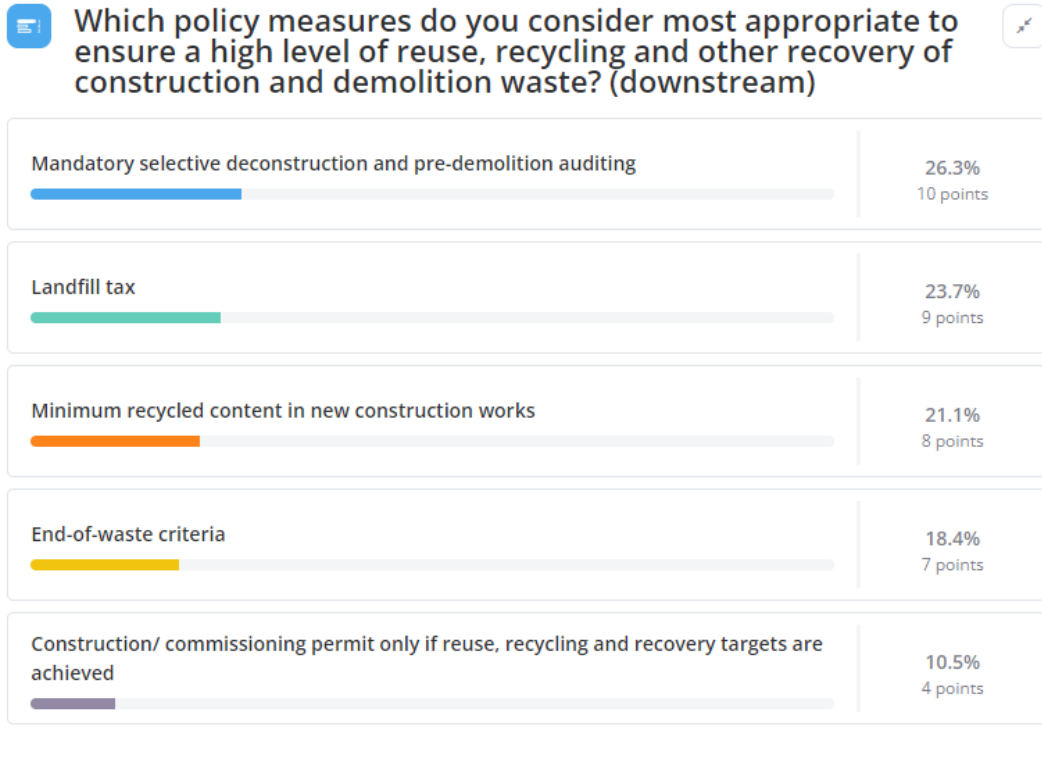


Figure 1: Results from the voting exercise to select policy measures for reuse, recycling and recovery of CDW (downstream)

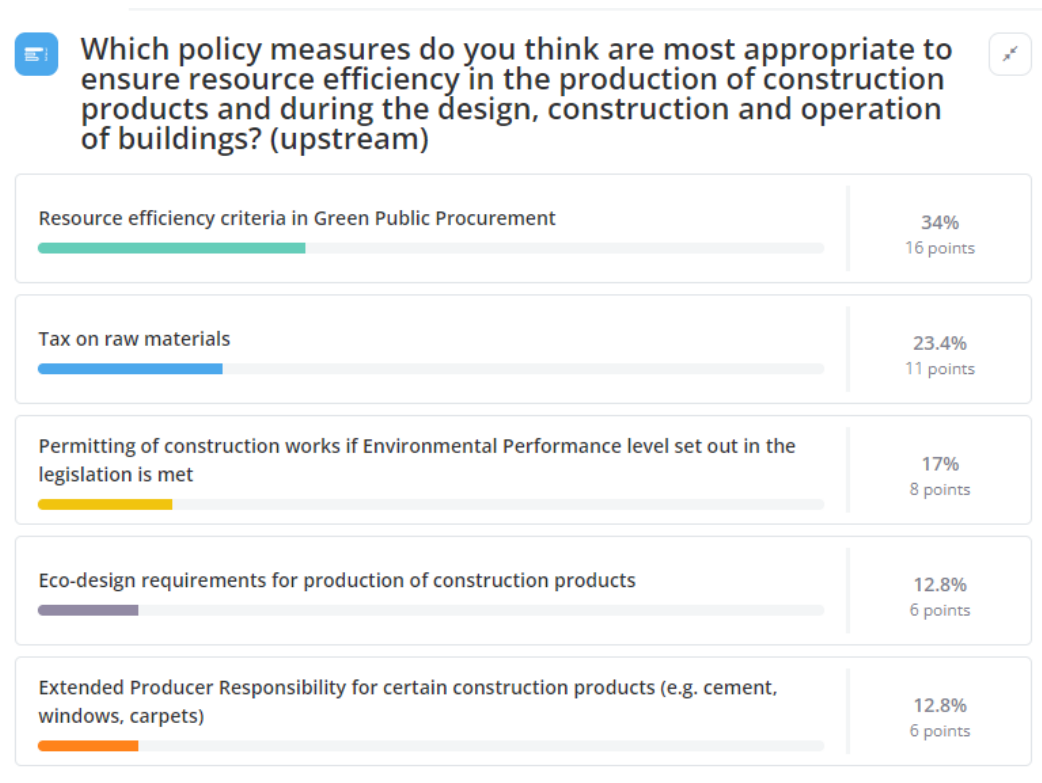


Figure 2: Results from the voting exercise to select policy measures for sustainable building construction (upstream)

The voting exercise was followed by an interactive discussion session to gather additional input from the participants. The outcome from the different discussions during the meeting is summarized in the following chapter.

Highlights from the discussion

The participants were involved in active discussions throughout the entire meeting. Discussion sessions were initiated following the presentations from the consultant, and the voting session (see previous paragraph). A number of questions were sent in advance with the invitation letter to stimulate the discussion, in order to investigate on:

- Barriers, key challenges and shortcomings for recycling of CDW in Croatia; as well as for more sustainable construction of buildings;
- Potential instruments to promote a greener CDW management, including instruments to better stimulate the private sector;
- Role of the local governments to steer the process.

The different input and views of the stakeholders are thematically summarized below, following the leading questions.

What are currently the main barriers/key challenges for higher rates of use of recycled construction material, and broader use of more sustainable construction material and other components?

- **The main problems highlighted concern the economic viability of recycled material and its availability.** Generally, becoming 'greener', makes most of the things more expensive as there is, at present, more administration, more taxes, etc. Those who are acting more environmentally friendly should not be penalized. The raw material is also much cheaper than recycled material.
- **Recycling CDW can be more expensive than other waste treatment practices.** Landfilling of waste is very cheap in Croatia (several Euros per ton), while recycling is more complex and more expensive. In some other countries, the reuse and recycling of material is stimulated by the government via subsidies. In Austria, for instance, the process towards recycled material is also stimulated by banning mineral fractions on the landfills.
- **Waste cannot be acquired or purchased on the market in Croatia.** The recycling companies need to get access to this waste, but there is no such functional market developed. Moreover, if obligations on recycled CDW are envisaged, a recycling market for CDW needs to be developed in advance to avoid that companies from being forced to import recycling material in order to respond to the obligations. Since some companies already have certificates and apply standards, they need to be brought to a situation where recycled material is available and accessible.
- **The lack of financing is a crucial point.** There is a need to decide who is financing these activities: investors or the public sector (e.g. municipalities). In the case of the public sector, eventually, taxpayers will be those who would have to shoulder the burden (and this is not in line with the CE thinking). If investors need to pay, they will have more motivation to finance CE solutions and that is why the financing should be borne by the investors.

How can investors and construction companies be motivated to make broader use of such material?

- **Include requirements for recycling in tender requirements, including in Green Public Procurement tenders.** The Croatian Chamber of Commerce (HGK) has been working with the Ministry of Economy and Sustainable Development (MoESD) and promoting Green Public Procurement for more than 8 years, but still feels that more promotion is needed. The example of how GPP was applied e.g. in Berlin (Germany), could be suitable for Croatia. Here, old bricks are used in new buildings, and based on the good experience now these requirements will be extended at the national level. However, in this case, sufficient amounts of recycled aggregates need to be available.
- **Promote green concrete.** Many countries use so-called green concrete. Although there is no legal definition, the term “green concrete” has gained popularity as concrete with a high content of recycled waste. European standards⁵, allow the use of recycled materials in concrete but their use in different applications is regulated by national standards. Generally, up to 20 percent substitution of virgin aggregates with concrete waste is not considered to lower the new concrete’s properties or influence its workability. The Dutch standards and guidelines, for example, allow up to 50 percent by volume of the stony fraction of concrete aggregates for certain applications to be recycled, while in Belgium up to 20 percent by volume of the coarse aggregate fraction is acceptable under certain conditions without additional testing or proofing. Standards also set limits for the content of bricks and tiles and impurities in recycled aggregate in concrete. Governments can foster the use of greener concrete, which also entails parts of recycled material, by including specific requirements on GPP tenders based on the national standards.
- **Economic stimulation is key.** Several observations can be made:
 - **Co-financing of recycling** activities could be an option to improve the practice in the country. For example, in Finland, since deconstruction is more expensive than demolition, deconstruction is subsidized through public funds.
 - **The evaluation of the economic viability of deconstruction and selective demolition over demolition** should also be assessed ex ante. Since deconstruction is more expensive than demolition, the two practices and their cost should be considered in the assessment phase to decide to which level the deconstruction should take place, and from which point is demolition more economically viable than deconstruction. Nevertheless, the final use of the deconstructed material is essential to decide which is the most appropriate procedure. If well-developed technologies can be used, more material can be sorted out, and then no stricter requirements for deconstruction are required. On the other hand, if simple technologies are used (like crushing), then more complex deconstruction criteria are needed to have more "elemental" waste. Also, the quality that is needed from the process depends on the final application of the product. For instance, current standards allow certain impurities in the content of the concrete, which might not be suitable for all applications.
 - **Funding mechanisms from the EU** for financing the selective demolition and recycling of CDW should be also promoted. These should ideally have simple and straightforward

⁵ EN 206: Concrete – Specification, performance, production and conformity; and EN 12620: Aggregate for concrete.

systems for funding. A financing system should also have priority over other types of financial mechanisms, such as taxes.

- **Voluntary agreements** with the private sector might also be a potential solution to increase its participation. Recyclers need some business plan or guarantee for the return of investments, otherwise, it will be economically not attractive. A solution to this might be a kind of 'Green Deal' with very specific agreements among the players. A memorandum of understanding (MoU) might be helpful or perhaps available material that can be shared within the companies.
- **Establishing rules in collaboration with the companies** might yield better results. A ban on the disposal of mineral fractions in the Republic of Croatia, for instance, might likely increase the number of illegal landfills. This problem also applies to other types of waste. The impossibility of financial stimulation of desirable behavior and insufficient mechanisms for achieving and maintaining communal order (inspections, communal policing) cause problems in the field.

The **identification and availability (mapping) around CDW for recycling** are crucial factors to be ensured. Specifically:

- **Mapping of the recycling facilities.** The aim should be to collect and recycle the waste locally, but in order to do so, it is necessary to know how much CDW material is available, and where it is available. The connection between the available CDW waste and the demand is currently missing. Future actions on CE on CDW should assess which local governments have, or should have, recycling yards to properly sort the CDW waste. Hence, the potential use of CDW material in Croatia should be mapped to get a clear overview and based on that the measures should be evaluated. However, it is worth noting that without a proper recycling infrastructure and market for CDW material the system would not work.
- **Mapping of the activities that can benefit from CDW, such as the production sector/identification of market players.** Each material can be reused and also be used in different products. Therefore, there is the need to map and identify what industry could benefit from what type of CDW material.
- **Mapping of abandoned buildings** is also quite limited at the moment. Gathering data of municipalities and cities will enable them to analyze possible future projects and handle building management in the area.

Increasing the amount of available CDW waste for recycling – consider disaster waste from earthquakes:

- Additional recycling material could come from the management of disaster waste, e.g. that resulting from earthquakes. Despite the unpredictability of hazardous events, mapping and zoning of seismic areas is a common practice that can provide estimations of how much disaster waste could be generated during an event of a certain intensity. Knowing this information is particularly important for the emergency response actions; however, proper pre-planning can help identify the activities that can be implemented during the emergency response to increase proper waste management, such as recycling. This can be done, for instance, by identifying proper temporary storage for the disaster waste, where sorting and

recycling activities can be performed safely. Large-scale pilot projects and mapping of recyclable waste, together with disaster waste, could also be started.

What is the role of the local authorities in stimulating communal waste management enterprises?

Raising the costs of landfilling/landfill tax can make recycling more competitive. All successful countries did so and introduced higher landfilling fees. Local governments need to come to solutions (agreements).

Local governments should strengthen their collaboration with local companies for managing CDW. In Croatia, the municipalities are fully responsible for waste management. Some small quantities of CDW are accepted in local facilities (e.g. if one renovates their bathroom). But local facilities do not have enough capacity to accept all the waste and process it; local companies might be interested in recycling the waste and investing in recycling machinery.

Local capacity should be strengthened also in terms of control. International investors sometimes come and build new buildings without following the legislative rules; regulation must also be introduced to avoid that situation.

2.2 Survey on CE and results from the survey

In the course of the project, the WB carried out a stakeholder survey asking for opinions on the introduction of a circular economy in Croatia. The survey included representatives of the national, regional and local public sector, private companies, academia, NGOs and consumers' representatives. The survey indicated respondents' opinion on introducing a circular economy in Croatia, on the role of different stakeholders and their opinion on barriers and initiatives needed to increase the level of circularity in the Croatian economy. Also, **respondents expressed their training and capacity-building needs when it comes to CE topics.** Even though the survey was designed to analyze stakeholders' position toward CE in general, its results can be used to identify the needs and expectations of main groups of stakeholders and assist to design capacity-building training related to circularity in the construction sector.

All groups of respondents evaluated CDW management as the **worst managed waste stream in Croatia.** At the same time, the construction sector, as well as the CDW stream, were assessed to have **the greatest potential for the development and application of the circular economy approach.**

Role of different stakeholders – highlights from the survey

The importance of different stakeholders' roles in the circular economy transition was pointed out in the survey. According to the survey result, waste management companies (utility companies, recyclers, WMCs) and state institutions are the most important WM stakeholders in Croatia, with the Ministry of Economy and Sustainable Development (MESD) as the institution in charge of the process of establishing a CE in Croatia, in cooperation with local (regional) governments. The top 3 key-rated institutions highlighted in the survey are the following:

- Private sector (industry and trade);
- Waste management companies (recyclers);
- Local governments.

State institutions, waste management companies, and local communities have a decisive role in choosing the appropriate technical solutions for WM. The role of institutions in circularity transition was also pointed out:

- Ministries are responsible for the framework, incentives, call for project proposals;
- Counties and cities complement the national authorities, tailoring the interventions to the local needs;
- Companies for secondary raw materials processing; and
- Manufacturing companies need to initiate new production lines that partially complement or add to their existing production processes or initiate completely new compatible production lines.

The majority of private sector respondents answered that companies have undertaken certain CE initiatives in waste management mainly in relation to public policies, educational programs, consumer education. Thus, we can conclude that the private sector is acquainted with the concept of circular economy and is willing to engage in circular economy practices. All of the private sector respondents expressed their willingness to invest in the technology to increase the circularity of their products and production processes. Private sectors respondents expressed an opinion that **circularity can only be achieved through coordination, understanding and complementing between the public and private sectors**, and by no means through single actions. Respondents pointed out that the main strength of the existing WM practices is growing awareness of the benefits of sustainable waste management.

Barriers for a CE in Croatia

The identified barriers and weaknesses related to the CE in Croatia for the existing waste management practices, according to government and NGOs respondents, include:

- Disposal of waste without prior processing;
- Low degree of separation of useful raw materials from waste;
- Absence of a developed recycling industry;
- Low cost of waste disposal.

Most consumers think that the separately collected waste is not managed properly after collection.

Lack of mechanisms for coordination and communication and lack of cooperation among key WM actors was reported by $\frac{2}{3}$ of all respondents. Regional and local governments rarely team up with neighboring counties/local governments to apply the so-called 'economy of scale' in setting up their waste management systems.

The biggest identified threat for the development of the sustainable WM includes further delay in the implementation of projects, lack of political will, lack of cooperation between the actors in the system and lack of funding for setting up the system.

Private sector respondents identified the following barriers to CE transition:

- Lack of education and information was identified by 87% of private-sector respondents which indicates the need for capacity building and training;

- Lack of sufficient clarity of the status of industries involved in CE that could create an industrial symbiosis (80%);
- Insufficient quantity and quality of incentives [(lack of incentives to change their business as usual (tax, technical, economic) (67%);
- Insufficient knowledge among governments, municipalities, industries, SMEs of the concept of CE (53%);
- Lack of matching events between interested parties (53%);
- Regulatory barriers (47%);
- Lack (or very few) government policies and regulations with regards to the circular economy (for 1/3 of respondents);
- Lack of extended producer/retailer/consumer responsibility (27%);
- Lack of understanding of the concept; and
- Lack of a multi-stakeholder platform (both at 20%).

Regulatory barriers for adopting circular economy approaches that are most applicable to the private sector situation include:

- Poorly defined targets and objectives: insufficient or unclear instruction for the industry (80%);
- Implementation and enforcement failures: limited, disparate, or not enforced in practice, leading to the regulations being diluted or altered (60%);
- Inadequately defined legal frameworks: atomistic and unsupportive policy, regulation and standards (40%);
- Unintended consequences: unforeseen negative impacts or trade-offs not evaluated sufficiently (20%).

Measures and initiatives to increase the level of circularity in Croatia

Additionally, measures and initiatives to increase the level of circularity in Croatia were identified.

The biggest opportunities for the development of sustainable waste management, according to the respondents include:

- Availability of new technologies;
- Possibilities of project co-financing from EU funds;
- Learning opportunities from best waste management practices;
- Faster and easier training and informing of all the interested stakeholders.

Applying the CE approaches in waste management is also considered a business opportunity.

Respondents replied that the following tactics could push **decision-makers to accelerate the transition to a circular economy**: Compliance with legal duties and responsibilities, ensuring continued communication and cooperation of all decision-makers, continuous education and provision of information relating to the benefits of CE, set realistic quantitative targets at a national level.

The most convincing method of **motivating the general public** for a faster transition to a circular economy, according to all the respondents are:

- Continuous education and provision of information relating to the benefits of CE;
- Ensuring infrastructure that is easily accessible;
- Introduction of financial instruments (incentives);

- Introduction of restrictions and sanctioning if useful raw materials from waste are not separated; and
- All respondents agree that **cooperation among key stakeholders is crucial** and that it should be stronger and more efficient.

The measures most needed in order to move towards a CE, according to the majority of governmental respondents are:

- Educating and informing all the actors/stakeholders;
- Investing in new technologies for manufacturing recyclable products;
- Investing in sustainable waste management; infrastructure for separate collection and recycling;
- Introducing the mandatory minimal share of recycled material in new products.

Key investments to accelerate the transition to the CE, for the majority of private-sector respondents, include:

- Developing scientific and technical activities (80%);
- Conducting research and innovation (67%);
- Designing innovative products (47%);
- Construction of the prototype and testing (40%).

Types of funding the public or private sector would potentially need to implement CE initiatives include:

- Government grants (for 93% of respondents);
- Internal investment (46.7%);
- External public investment (26.7%);
- External private investment;
- Bank loans;
- Corporate bonds (4,5 and 6 all at 13.3%).

It was also highlighted that legislation that would make the **disposal of construction waste more expensive** than recycling into a new construction product is needed.

Most of the respondents agreed that the **separation rate among citizens/consumers would increase if 'landfill tax' is to be introduced**. Local governments and recyclers pose different opinions on the introduction of landfill tax considering that it would not motivate citizens/consumers to increase waste separation, but that it would instead only increase illegal dumping of waste.

The majority of MESD respondents confirmed that **investments are planned in the private sector for the production of recyclable products**, and these would be financed from the new EU financial period 2021-2027. Almost all of the regional government respondents (over 90%) said their new **7-year waste management plan due in 2022 would include CE measures** specifically.

The respondents expressed the need for more activities related to promoting, disseminating knowledge on sustainable waste management and the transition to a circular economy.

Capacity building & training needs

All of the respondents expressed the need for additional knowledge/training. **The rating of suggested training topics is the following:**

- 1) Knowledge of the concept of circular economy (CE): Myths and misconceptions related to technologies in waste management;
- 2) Actors in waste management and their role in proper and adequate waste management in Croatia;
- 3) Stakeholder network and coordination mechanisms;
- 4) Raising public awareness about CE practices in waste management;
- 5) Identification of problems and ways of making decisions about CE;
- 6) Knowledge of legal aspects and legal obligations related to CE procedures in waste management;
- 7) Consequences of a linear economy on health and the environment.

Training and educational needs presented per different type of stakeholders are highlighted in the table below.

Table 2: Training and education needs for a CE in Croatia as evidenced by the participants of the survey, according to different stakeholder categories. Responses > 60 are highlighted in green

Need for further capacity building	MoESD	Regional and local government respondents	Private sector
Knowledge of the concept of circular economy (CE): Myths and misconceptions related to technologies in waste management.	64%	64%	53%
Identification of problems and ways of making decisions about CE.	64%	50%	53%
Actors in waste management and their role in proper and adequate waste management in Croatia.	46%	64%	60%
Stakeholder network and coordination mechanisms.	46%	50%	60%
Raising public awareness about CE practices in waste management.	33%	57%	< 50%
Consequences of a linear economy on health and the environment.	< 10%	< 10%	< 50%
Knowledge of legal aspects and legal obligations related to CE procedures in waste management.	< 10%	50%	53%

3 Overview on the identified priorities for training and building activities

Survey results suggest that local governments would most benefit from further education and training on CE, especially given the highlighted importance of utility companies (managed mostly by local governments) in the process of establishing CE in Croatia, expressed throughout the questionnaire.

According to the majority of private-sector respondents, the current government policies provide low, or no level of support towards waste management and circular economy transition. Almost half of them could not specify these policies, mainly because they are either not aware of them or because they think such policies do not exist. We could conclude that private sector could benefit from training on circular economy policies.

Training should be designed to address concrete possibilities, taking into account the specificities of individual regions, diversity of nature and the level of economic development and waste burden throughout the year. Training should also cover examples of good practices both from Croatia and other countries that successfully applied circular solutions in their WM practices.

One of the main objectives of the present report is to propose a further capacity-building program on CE for multiple stakeholders including national, regional and local levels of government authorities, private sectors and other relevant stakeholders.

The preparation of a targeted capacity-building program requires responsibilities to be regulated and institutions to be established. For developing the national Circular Economy Action Plan (CEAP), the following issues should be clarified beforehand:

- The exact policy options that the Croatian Government intends to implement to introduce the circular economy concept in the construction sector;
- Which responsibilities each of the players in the construction value chain will have and which institutions will be responsible for enforcement of the obligations.

To develop an effective capacity-building program, these questions need to be answered. The **stakeholder consultation held as part of this project highlighted some policy priorities**, including the introduction of pre-demolition auditing, landfill tax, resource efficiency criteria in Green Public Procurement and tax on raw materials. At this stage, the necessary legal requirements and the usual institutions responsible for implementing these four policy options can be identified based on their experience in implementation in other countries and taking into consideration the possible role of existing competent authorities in Croatia. These assumptions are the basis for the assessment of capacity building needs. The following sections discuss the possibilities for building the necessary institutional framework and the typical obligations of individual actors to implement the four policy options in Croatia, identified as most important during the stakeholder consultations. However, after the adoption of the National Circular Economy Action Plan, policy decisions that do not correspond to these assumptions are likely to be made. Therefore, the current capacity-building program will aim to facilitate the decision-making process and assess the capacity-building needs based on international experience for the implementation of selected practices and obligations already in force in Croatia. However, after the adoption of the National Circular Economy Action Plan and the relevant

implementing legislation, there will be a need for new capacity-building activities focused on the institutional setup and legal requirements as adopted.

Mandatory selective deconstruction and pre-demolition auditing

The audit of potential reusable material before demolition of buildings and infrastructures is performed during the demolition planning and aims to identify the type and quantity of elements and materials that will be deconstructed and/or demolished, and to give recommendations for their further treatment including assessment of the viable recovery routes for materials from CDW.

In order to ensure the implementation of this measure, it is necessary to introduce obligations, to create the necessary institutional framework by imposing responsibilities for control and enforcement of these obligations. Concerning to the introduction of mandatory selective deconstruction and pre-demolition auditing, the following obligations are required and, accordingly, the creation of new or imposition of responsibilities on existing competent authorities to ensure compliance with these obligations will be needed:

- Before the demolition:
 - Legal obligations for carrying out an investigation (audit);
 - Identifying the most suitable persons to be responsible for organizing and financing the audit and requirements for the competence/qualification of the auditors;
 - Establishing procedures for documenting the investigation and its results;
 - Appointing competent authorities.
- During the demolition:
 - Legal obligations for carrying out demolition (selective deconstruction) including standards containing technical requirements for demolition;
 - Identifying the most suitable persons to be responsible for organizing and financing the selective deconstruction and documenting it;
 - Establishing procedures for documenting the selective deconstruction, separating the waste;
 - Appointing competent authorities to control the demolition, to check the selective deconstruction documentation and possibly approve the documentation.
- After the demolition (selective deconstruction):
 - Legal obligations for record-keeping, reporting to the competent authorities;
 - Tracking the waste to the final treatment/use.

These are the general steps required to implement mandatory selective deconstruction and pre-demolition auditing. The implementation of the above concept in Croatia requires decisions on how stringent the requirements are, taking into account the affordability for business and consumers, which regulations need to be amended, which existing or new competent authorities should be entrusted with the control of the implementation of the new requirements. Possible decisions taking into consideration the international experience and existing practices already in place in Croatia are listed below.

- **Before the demolition:**

- **Legal obligations for carrying out a pre-demolition audit.** *Article 8 of the Ordinance on construction waste and waste containing asbestos* requires that the investor is obliged to inform the contractor about the materials and substances that are in the building and which are hazardous waste or which are certain to become hazardous waste. However, the main focus of the obligation of informing is the hazardous waste without requiring the provision of information regarding potentially recoverable and recyclable waste or potential pollutants and substances that might hinder the subsequent treatment of demolition waste (interfering substances). In the context of CE, the main objective of the pre-demolition auditing should be the prevention of material losses for the economy, therefore an amendment of Article 8 of the *Ordinance* would be necessary. Depending on the size of the demolition project, the audit procedure may vary in complexity (comprehensive, indicative – for example, Austria) and would need to be carried out by specialists with different qualifications (e.g. for complex investigations – external experts or scientific institute qualified in a wide range of specialties such as structural engineering, demolition work, waste treatment, construction chemistry; for the non-complex investigations – trained demolition expert; and for the simplest projects – no expert evaluation is required). Subsequent training and capacity building of the competent authorities, obligated persons and construction companies for implementation of the new requirements will also be needed.
- **Persons responsible for the pre-demolition audit.** The investor is obliged to provide the information specified in Article 8 of the Ordinance to the contractor. Regarding capacity building, it is necessary to ensure this information is of sufficient quality and meets the criteria for competence/qualification of persons that will carry out the investigation for provision of the required information.
- **Establishing procedures for documenting the investigation and its results.** The development of an effective enforcement capacity will require the current untraceable provision of information to be transformed into a regulated pre-demolition auditing procedure.
- **Appointing competent authorities.** Currently, the competent authorities are not involved in the process of information exchange between the investor and the contractor that will perform the demolition, but if pre-demolition audit becomes a standardized procedure, competent authorities should control the investigation of the building, check the documentation and possibly approve the results of the investigation before its submission to the demolition company.

- **During the demolition**

- **Legal obligations for carrying out demolition (selective deconstruction).** Article 76 of the Construction Act requires that demolishing of a building should be carried out in accordance with the building demolition project. The project should also contain requirements on how to manage the construction materials and waste generated by

the demolition of the building. The rules for the management of demolition waste are further specified in Articles from 9 to 13 of the *Ordinance on construction waste and waste containing asbestos*. These legal provisions are specific about the hazardous waste management, but very general regarding waste suitable for reuse and recycling, without specifying the waste types (other than hazardous waste) and contaminants (e.g. gypsum-containing waste) that might hinder subsequent recycling that should be removed and separated. It is also recommended for the possible use or disposal of CDW to be determined prior to demolition. Moreover, there are different selective deconstruction requirements applied to different types of buildings and construction works (usually strict requirements do not apply to linear structures and traffic areas). Further regulation is needed to strengthen the capacity for selective deconstruction in the form of technical standards or secondary legislation containing technical requirements for demolition and empowering the competent authorities to control the implementation of these requirements.

- **Persons responsible for the pre-demolition audit.** In accordance with the Construction Act, the investor should assign the development of building demolition project to a qualified designer. Concerning the training and qualification of the designers currently, the focus is on structural stability and mechanical resistance of the demolished buildings and hazardous waste management but additional requirements for the waste management skills would be needed.
- **Documenting the selective deconstruction.** Currently the building demolition is not subject to permit procedure unless it is a part of a larger project that requires a construction permit⁶. Record-keeping and reporting obligations are set out in Articles 13-15 of the Ordinance. Provided that a decision is taken to strengthen the pre-demolition audit procedure, it may be necessary to introduce both ex-ante control (pre-approval of the demolition method as part of the demolition project or as a new procedure) and ex-post-facto control by submitting a demolition report and improving the report after inspection and verification by the competent authorities. A simplified procedure is also possible – the investors and their contractors will be required to document the manner of demolition, keep the documentation for a certain period (for example, 5 years), and provide it upon request by the competent authorities. In any case, the capacity of the competent authorities and the capabilities of designers and builders should be increased in regard to CDW separation for reuse and recycling.
- **Appointing competent authorities to control the demolition.** Authorities responsible for issuing construction permits are also responsible for controlling the demolition activities. However, it might be necessary to also involve waste management authorities to check the selective deconstruction documentation and possibly approve it.

⁶ As part of the construction permit there are obligations to provide solutions in the main project for special technical conditions for the management of construction waste generated during construction and removal of the building.

- **After the demolition (selective deconstruction)**

- Record-keeping and reporting. Currently, the results of the implementation of the waste-related measures in the Building demolition plan are not reported and no documentation is required to be kept⁷. In order to strengthen the control, the results of the demolition could be made available to the competent authorities either by requiring investors to prepare a report and submit it for approval or just by asking investors to keep the documentation and present it upon the request of the competent authorities.
- Tracking hazardous waste and other waste from dismantling to the treatment facility. Reporting obligations are laid down in Article 13-15 of the Ordinance but in order to trace the path of the waste to the different types of treatment (recycling or other types of material recovery such as backfilling), an additional breakdown of the waste codes defined in the European Waste Catalog is needed.

Landfill tax

In different countries, landfill tax has been introduced for different initial purposes, such as to better reflect the environmental costs of landfilling (the UK) or to provide funding to clean up contaminated sites (Austria). However, the landfill tax leads to a reduction in overall waste levels produced and less waste sent to landfills. Decisions need to be taken about three aspects: First, the structure of the landfill tax, second its rate, and third the time of its introduction. These factors are determined by the purpose of the tax and the problems it aims to solve. Therefore, in order to make the right decisions regarding the introduction of landfill tax in Croatia, it is necessary to define in advance the pursued objectives, the expected problems, and the obligations to be introduced, furthermore, which competent authorities should be involved and what functions they should perform, respectively.

Determination of the most suitable landfill tax structure

Different options for the structure of the landfill fee are possible depending on the main effect that is intended to be achieved, as follows.

Landfill tax based on the type of waste. This is the simplest structure for introducing the fee, which is based on a tariff for two types of waste - hazardous and non-hazardous (for example, initial landfill tax tariff of Austria) or inert and other waste (according to the example of the UK). This approach can help reduce the harmful effects of landfills on groundwater and internalize waste management costs, but cannot affect the technology of landfilling or limiting carbon dioxide emissions. At the same time, the introduction of this approach is easy because no new criteria for differentiating tax bandings are required, as the procedure for distinguishing hazardous from non-hazardous waste is laid down in the Waste Framework Directive and the European Waste Catalog. The existing information systems for waste reporting and tracking of hazardous waste in Croatia can be applied without changes and

⁷ There are certain obligations to have documentation according to regulations on waste management. During the construction of a building, the contractor is obliged to manage construction waste generated on the construction site and recover and/or dispose of construction waste generated during construction on the construction site and keep the required documentation on the construction site in accordance with regulations governing waste management.

information on the amount and movement of both waste types can be provided to the authorities that will collect the tax. However, it is necessary to ensure compliance with the existing rules for the classification of waste, otherwise, the fee may cause loss of revenue. This is especially true for mirror entries of the European Waste Catalogue and mixtures between hazardous and non-hazardous waste, which generally make the whole waste stream hazardous. To ensure the reliability of the data, the administration responsible for data quality control must be aware of the risk factors that lead to the mixing of waste and insufficient separation of waste so that inspections can focus on the violators with the highest risk. In any case, the capacity of the administration responsible for the classification and reporting of construction waste and tracing of hazardous waste should be strengthened in order to know the methods of demolition that lead to waste mixing, sorting technologies and hazardous waste acceptance criteria. The reliability of the reported data should be increased. Furthermore, it is possible to break down the tariff into more types of waste to further encourage source separation and selective deconstruction⁸. If necessary, additional codes supplementing the European waste catalog can be defined to better differentiate and report the type of landfilled waste. This will further exacerbate the problem of mixing different types of waste, the reliability of the data and the need for capacity building, control and inspection. Upgrade of the information systems might be needed.

Landfill tax based on other waste properties. If the aim is to limit the disposal of waste by criteria other than the hazardous properties of the waste (e.g. limiting CO₂ emissions from landfilled waste), an additional separation of waste types may be added to the structure of the landfill tax (e.g. biodegradable waste). For this purpose, an indicator and limit values (e.g. dynamic respiration index) must be determined and, if necessary, the existing criteria and procedures for the acceptance of waste at landfills set out in the *Ordinance on ways and conditions of waste disposal, categories and working conditions for waste landfills* (Landfill Ordinance) could be used. Existing legislation already defines the competent authorities responsible for accepting waste at landfills (including biodegradability criteria), but in regard to capacity building, attention must be paid to the correct application of acceptance procedures and the reliability of reported data on quantities and type of waste as discussed above.

Landfill tax based on landfill technology. The structure of the tax may be based on the technology of disposal, and for landfills that are built and operated in compliance with high standards, the rate is lower. The technical requirements for the different categories and subcategories of landfills regulated in the Landfills Ordinance can be used as criteria for distinguishing the level of environmental impacts by the different landfill technologies. This will help bring the landfills in compliance with the requirements of the Landfill Ordinance and phase out the non-compliant dumpsites. A lower tax rate will be applied for the disposal of waste at landfills that meet the requirements of the Ordinance. High taxes can be applied for the disposal of waste in landfills which category does not correspond to the type of waste. This practice is prohibited by the Landfill Directive and the Croatian Landfill Ordinance, however, due to the lack of suitable alternative facilities, this ban is not always practically applicable. The tax rate may be further broken down by the degree of non-compliance of the landfill - for example the absence of individual components according to the Ordinance on landfills (e.g. bottom sealing

⁸ For example, the landfill tax tariff in Austria before 2004 contained 5 bandings: demolition waste (the lowest rate per ton); excavated soil (also the lowest rate) non-inert excavated soil (medium rate) non-hazardous waste (medium rate), other (hazardous) waste highest rate.

layer, leachate collection and drainage system, etc.)⁹. Additional landfills sub-categories can also be defined e.g. landfills for excavated soil. The differentiated tax rate could be applied to other unwelcomed waste treatment operations such as backfilling. Any additional complication leads to more precise stimulation of good landfill technologies but complicates control and, therefore, efforts are needed to increase the capacity of the administration. If the presence of individual components is used as a criterion in determining the rate or if new subcategories of landfills are introduced, the administration that will collect the tax must have timely and reliable information not only on the type and amount of waste but also on the category and subcategory of the landfill and the presence of specific landfill components. A complex landfill tax structure is most needed now as a significant proportion of landfills do not meet the requirements of the Landfill Ordinance (to one degree or another)¹⁰, and a complex structure leads to a better assessment of compliance level and provides economic incentives for landfills that achieved a higher level of compliance. Subsequently, when all landfills meet the requirements, the tax structure can be simplified and applied to categories and sub-categories of landfills currently specified in the Landfill Ordinance¹¹.

Landfill tax structure that takes into consideration the proximity principle. The Proximity Principle is a cornerstone of EU waste legislation and concerns the desirability for waste disposal to occur as close to its site of production as possible. A higher tax rate for waste delivered from other regions is an appropriate measure against the so-called “waste tourism” by preventing the shipment of waste to facilities that apply lower landfill standards and offer lower landfill gate fees¹². Before deciding to adopt such a landfill tax structure, a detailed analysis of the situation in the different regions of the country is needed. Afterward, the waste information system should include an effective mechanism for tracing the path of the CDW.

Appropriate tax structure for revenue-raising purposes. If the main purpose of the landfill tax is to act as a revenue-raising mechanism and to solve specific waste-related problems¹³, then it is best to apply a simple structure in order to easily collect the tax and eliminate the need for complex procedures to differentiate quantities per different tariff rates. However, in this case, appropriate legal procedures and institutional set-up must be established in order to ensure that landfill tax revenues are exclusively used to finance the activities for solving the problems for which the landfill tax is created in the first place. An institutional set-up should be set up for transparent spending of tax revenue, through tendering of respective activities by a public authority (e.g. the Environmental Protection and Energy

⁹ For example, the tax rates in Austria before 2004 for lower standard technology landfill sites were on the basis of 5 types of waste but in addition, there were surcharges in case the waste is accepted at a landfill with inadequate insulating system or without vertical enclosure. Sites that met the required criteria in terms of the technology requirements of the Austrian Landfill Ordinance were charged on the basis of landfill type.

¹⁰ This is evident by the infringement procedure INFR (2021)2169 from 12/11/2021 started by the European Commission against Croatia for non-compliance of landfills with the Landfill Directive.

¹¹ Austria had in the past a complex landfill tax structure but when all landfill sites become ‘state of the art’, the tax was amended to its current form. Current rates (since 2012) are as follows: landfills for construction or inert waste and soil excavation: EUR 9.20 per ton; residual waste landfills: EUR 20.60 per ton; and mass or hazardous waste landfills, including output from MBT: EUR 29.80 per ton.

¹² In France, there was a 50% increase in the rate for waste from outside the area covered by the local waste disposal plan, which covers each district (departement). In Austria, the province of Salzburg has introduced a waste law in July 1999 stating that, ‘waste should be transported to the geographically and logistically nearest landfill’.

¹³ In Austria, the main purpose of the landfill tax was a revenue-raising mechanism, and that remains one of its key aims today, for solving specific problems with high-profile contaminated sites.

Efficiency Fund) or involving private financial institutions (e.g. evaluation of projects by banks). In any case, it will be necessary to strengthen the administrative capacity for tendering, evaluation, and approval of projects for activities, which would be financed by the revenues from the landfill tax. It should also be clear that revenues from this mechanism are expected to decrease continuously due to the preference for other methods of waste treatment and limiting landfills. Other sources of funding must then be sought. Therefore, the activities financed by the revenue from the landfill tax must have a time horizon coinciding with the expected deadline for the cessation of C&D waste landfilling.

Landfill tax exemptions

Furthermore, particular activities could be exempted from the landfill tax, including repositioning of waste (from old landfill to compliant landfill), landfilling of wastes from natural disasters and use of the material as part of a restoration layer or as temporary surface cover. In this regard, it may be necessary to upgrade the information system for waste reporting, by adding sub-codes to waste management activities to differentiate activities that are exempted from the scope of the landfill tax. When checking the reliability of the reported data, inspectors must distinguish between the excluded activities and the activities subject to taxation.

Landfill tax rate and timeline for its gradual increase

The tax rate is of paramount importance for achieving the objectives of the landfill tax because it determines the extent to which waste generators will be stimulated to change waste treatment methods and waste management practices and stop investing in landfills. On the one hand, if the rate is high, this may be practically tantamount to a ban, especially in CDW, which is in large quantities, and on the other hand, if it is low, it will not change waste treatment practices¹⁴, but will contribute to internalizing environmental impacts of landfilling. Concerning municipal waste, the landfill tax is a transitional instrument for a smooth transition to a total landfill ban, but in the case of construction waste it is a key tool as such a ban on landfills of construction waste is not (yet) envisaged.

A high tax rate would have significant consequences for the current operators of waste facilities and CDW generators, as they must switch to the supply/use of other CDW treatment services. Demand and supply of construction waste treatment services are inelastic and require time and investment for planning, construction and commissioning of treatment facilities. Therefore, a unilateral introduction of a high tax rate would provoke resistance from affected stakeholders and, it is key that any such amendments are given with an early warning, decisions are taken in open dialogue and that a longer-term view of further future developments is also provided on time¹⁵. The discussion of the time horizon for raising the tax rate should be part of a broader discussion and achieving voluntary agreement between the public authorities and private sector and the landfill tax should not be used as a tool of coercion but rather as a guarantee that businesses will fulfill their commitments set in the voluntary agreement until the period of drastic tax rate increases. The initiative for this dialogue with the affected stakeholders must come from the public administration, which requires development and

¹⁴ The early landfill tax in Austria helped start to shift some treatment away from landfills and was relatively uncontroversial due to its very low rate at introduction, but it was not until the 1996 Landfill Ordinance that federal states were finally made to act in changing waste treatment methods and waste management practices and stop investing in landfills.

¹⁵ Similar to the full-scale public consultation held in Vienna from 2000-2002 to decide what alternative treatment to invest in.

proposing a comprehensive concept for future construction waste management, knowledge of the prerequisites for the successful introduction of a high rate or other policy options that limit landfilling, pre-tax gate fees, availability of alternative treatment facilities (per region), expected financial impact, environmental benefits, impact on other CDW management policies and measures to overcome unwelcomed effects of the higher landfill tax rate. Deciding on the timeframe for raising the tax rate requires an in-depth study of the conditions in the individual regions, strategic planning of the CDW management infrastructure, as well as providing time for discussions and taking into account the fact that delays can be expected in some regions.

An increase in the cost of waste disposal due to the higher landfill tax rate might also lead to a rise in illegal dumping of waste, thereby causing failure to achieve both environmental and revenue-raising objectives. It is also expected that the amount of construction waste generated in small quantities (e.g. repair waste), which is disposed of together with household waste will increase. This is especially problematic because municipal waste fees are flat and are not linked to the amount of waste produced. It would be necessary to take measures against the so-called "waste tourism" which occurs in the period when not all landfills apply the requirements of the Landfill Directive and older non-complying sites have a strong competitive advantage. This is despite the higher and staggering waste taxes that they have to pay. Another negative consequence of high tax rate is the increase in "sham recovery" with increasing quantities of waste being sent to sites for low standard backfilling. For all these negative consequences, the administration should have a solution to overcome them.

Obligated taxpayers and landfill tax administration and control

For the introduction of a landfill tax, it is necessary to impose new obligations on taxpayers and create new or authorize existing institutions for the administration of the tax. The elements of a typical landfill tax, i.e. the areas in which an increase in the administrative capacity is needed are described below.

Level of centralization. Usually, the landfill taxes are implemented at a national level and are collected at the national level but the involvement of local/regional authorities is also necessary (for example, for locating the landfills within the district's boundaries in France and identification of suitable projects (contaminated sites) for tax revenue spending in Austria).

Tax revenue collecting agency. The landfill tax is collected normally by the national tax authorities (Austria, France after 1999, the UK and others) but there are also other practices such as in France before 1999 when the tax was administered by ADEME (Environment and Energy Management Agency of France). Landfill tax payments received by ADEME were fed into the Modernization Fund for Waste Management which was instituted by a decree and administered by ADEME. During that time the functions of ADEME were very similar to the Environmental Protection and Energy Efficiency Fund in Croatia.

Integration with other taxes. Usually, the landfill tax is a standalone instrument but in France, after 1999 it was integrated with other existing environmental taxes into the TGAP – General Tax on Polluting Activities, to integrate and simplify the system of environmental taxation and implement the "Polluter Pays Principle" more effectively. This had led to changes in responsible institutions and the ways of collecting and spending the tax.

Entities liable for paying the tax. The costs of the landfill tax are ultimately borne by the holders of the waste, but it is particularly important which persons are obliged to pay the tax to the tax administration. These are usually landfill operators (Austria, France, the UK), and in some cases, they cannot fully recover the costs from waste holders (for example in the case of municipalities in poor financial condition). In France, landfill tax was applied even to landfill sites with or without prefectural authorization and an inventory of illegal sites was required. Apart from landfill operators in Austria for example anyone using waste to carry out structural work (e.g. for road surfacing) and anyone exporting waste from Austria for the purpose of depositing is also liable. Establishment of an information system, data exchange (e.g. between waste information system and tax authorities), rules, and procedures are needed for the initial registration of liable taxpayers and in order to ensure that all obligated operators pay the tax and report reliable data.

Payment period. Different payment periods are possible, depending on the size of the facility. A high frequency of reporting by small facilities would be an unnecessary administrative burden. In France, the landfill tax had to be paid four times a year by facilities authorized to receive more than 20,000 tonnes of waste per year, while for those below this threshold, tax payments were made annually.

Taxable event. The taxable event is the waste delivery to landfill sites or other liable entities. It is necessary to decide on the documents certifying the tax event - invoice, handover protocol, weighing note, etc.

Documentation. According to the payment period, all persons or legal entities liable to pay the tax have to send to the tax administration (or ADEME in France in the past) a notification of tonnage delivered to them along with the tax payment due. Usually, the notification is a 'self-assessment' of the quantities in the form of a declaration. Therefore, procedures will be needed to control and verify the accuracy of the declared data, in the form of on-the-spot checks and cross-checks with the data in other information systems.

Agency in charge of landfill tax administration. Usually, the agency responsible for collecting the tax is also responsible for verifying the accuracy of the reported taxable quantities, but cooperation and exchange of information with other authorities (local authorities, waste management authorities) is needed. It is necessary for the agency in charge to be provided with sufficient financial resources and to have qualified and trained staff, incl. and in the field of waste types, types of activities and facilities for waste treatment. Various mechanisms for financing the administration of the fee are possible, ranging from budget financing to the establishment of management fees (e.g. "frais de gestion", which were previously applied in France).

Use of revenue. Landfill tax revenue must be used for a specific purpose usually for funding waste management-related activities. However, some countries set up compensating mechanisms so that the landfill tax is revenue neutral such as lowering VAT for waste collection and treatment services (France) or reducing National Insurance Contributions in the UK. Though, even in these countries part of the tax revenue is spent for funding waste management projects. Alternatively, the tax purpose could be a solely revenue-raising mechanism, but it must be exclusively used for a specific purpose as it is in Austria for financing the containment and treatment of contaminated sites. In the case of Austria, the subsidies given to firms to support the improvement of landfill sites have to be tailored to follow EU state aid policy. Should the revenue be used for funding waste management projects, rules

and procedures are needed for assessment of funding applications, distributing the funds and carrying out monitoring to ensure that approved measures are implemented. These activities could be performed by the personnel of the agency in charge of collecting the landfill tax revenue or alternatively private financial institutions (banks) could be involved¹⁶.

Resource efficiency criteria in Green Public Procurement

Currently, the application of criteria for green public procurement is voluntary, but it may gradually become mandatory with the development of legislation in the field of circular economy and resource efficiency in the construction sector and the introduction of tools such as mandatory assessment of Environmental Performance, Eco-design of construction products, mandatory minimum recycled waste in construction works, etc. The Law on Public Procurement gives contracting authorities in the Republic of Croatia the possibility to request a certificate of conformity for goods, works or services of an economic operator with environmental management standards (e.g. EMAS, ISO 14000). It also provides the possibility of including the so-called "Environmental criteria" in the technical specifications of the tender documentation for products and services and provides the opportunity to select the most economically advantageous tender in which the environmental characteristics of products and services are assessed. Legislation, therefore, provides the necessary preconditions for the implementation of green public procurement, but action should be taken to increase the motivation and know-how of the administration. As a first step, the administrative capacity should be strengthened in regard to training for implementation of internationally recognized GPP criteria in the construction sector such as the European Commission GPP, knowledge of the key environmental impacts of the sector, the availability and verification of green alternatives, and procurement strategies for reducing environmental impacts. In particular, the public bodies should be capable of implementing the following:

- GPP approaches for **eliminating or reducing environmental impacts** from construction works such as:
 - Design and construction to achieve high environmental performance and low associated CO₂ emissions;
 - Installation of high environmental performance and renewable building materials;
 - Design and specification to reduce the embodied impacts and resource use associated with construction materials;
 - Design, specification and site management to minimize construction and demolition (C&D) waste and to use building products or materials with a high recycled or re-used content;
 - Installation of physical and electronic systems to support the ongoing minimization of energy use, water use and waste generated by facilities managers and occupants.

¹⁶ In Austria, the subsidies arising from the tax revenue are managed and paid out by a bank. Applicants apply directly to the bank that has a section of specialists and experts to assess the potential projects. The final decision is taken by the Environment Minister on the basis of the level of technology. The bank carries out monitoring to ensure that approved measures are implemented.

- Internationally recognized guidance documents on GPP criteria in the construction sector such as EU GPP criteria for office buildings, road constructions, taps and showerheads, water-based heating systems, combined heat and power systems, wall panels, indoor lighting, etc.
- Theoretical concept and terminology of **EU GPP criteria** are divided into:
 - Selection criteria – used to assess the ability of an operator to perform a contract. It can only include criteria specifically related to the subject matter of the contract (e.g. project manager, design team and contractor shall have relevant competencies and experience);
 - Technical specifications – used to set minimum requirements that must be met by all tenders (e.g. – Building shall have an Energy Performance Certificate (EPC) class C, or three times the kWh/m² cut-off value or the best class, or a maximum of 135 kWh/m²);
 - Award criteria – used to stimulate additional environmental performance, but are not mandatory (e.g. points awarded based on the improvement in life cycle performance of the main building elements);
 - Contract performance clauses – specify how a contract must be carried out (e.g. contractor will implement a site waste management plan to monitor and report on during progress of construction work on-site);
 - For each set of criteria there are two levels of ambition:
 - Core – designed to allow easy application of GPP, focusing on the key area(s) of environmental performance of a product and aimed at keeping administrative costs for companies to a minimum (e.g. the contracting authority shall award points to tenderers that achieve an Energy Performance Certificate (EPC), class C) for new-build projects;
 - Comprehensive – take into account more aspects of higher levels of environmental performance, used by authorities that want to go further in supporting environmental and innovation goals (e.g. the contracting authority shall award points to tenderers that achieve an Energy Performance Certificate (EPC), class B) for new-build projects.
- **Needs Assessment.** In the context of circular economy assessing the need for new constructions is the first stage in the procurement cycle for GPP and aims to ensure that a true demand exists (e.g. repair, extend the life instead of constructing a new building, determining the right size of the building/capacity of a civil engineering project, sharing rooms with other organization, renting instead of constructing, etc.). To avoid unnecessary or inappropriate constructions, the public authorities need to know how to apply the following techniques:
 - Consulting users prior to launching a procurement to determine user needs and preferences by applying various techniques such as questionnaires, surveys, observation of use patterns, meetings, preliminary market consultations, comparison with alternative solutions;
 - Based on the user consultation and needs identification the contracting public authority should be able to define the subject matter of the contract and develop a specification. In this aspect, the administration should be able to define a technical specification based on performance-based or functional specifications (desired outcomes) instead of describing the inputs or standards;

- Considerations for joint procurement through applying approaches such as centralized purchasing body, framework or contracts, procurement with one or more other authorities;
 - Based on the user consultation and needs identification the contracting public authority should be able to estimate the total quantity or scope of the contract in order to maximize resources efficiency and reduce environmental impact - in the form of a range (e.g. 1200 – 1500 m² built area) based on observations on current user needs and any projected growth.
- The **process of developing and procuring construction works** during each key stage:
 - Selection of the design team and contractors – criteria to ensure that project manager, design team and contractor shall have relevant competencies and experience;
 - Detailed design and performance requirements such as recycled content in concrete and masonry, CO₂e/ton reduction for the transportation of aggregates to be used in specified building elements, sourcing legal timber;
 - Strip-out, demolition and site preparation works – Demolition waste audit and management plan;
 - Construction of the building or major renovation works – site waste management plan to monitor and report on during progress of the construction works on-site, separation and minimization of waste, measurement of energy performance;
 - Installation of energy systems or the supply of energy services – heating systems, including combined heat and power;
 - Completion and handover - audit to ensure environmental performance of the building, audit to ensure continuity of insulation and a high standard of airtightness, energy management system (BEMS) audit, installation and commissioning of low or zero-carbon energy sources;
 - Facilities management – waste management system that allows occupants and on-site catering services to segregate paper, cardboard, food and drink packaging, specification of performance contracts, control, and management of energy consumption.
- Knowledge and application of main **GPP criteria** related to:
 - Environmental Product Declarations (EPDs) of the main elements;
 - Sustainable construction materials and sourcing (Lifecycle performance of materials, use of recycled content, material transportation, sourcing of legal timber);
 - Recyclable waste storage and waste management system (separate waste collection during use);
 - Demolition waste management (waste management plans during construction);
 - Installation and commissioning of energy systems and low or zero-carbon energy sources (evaluation and testing of the energy performances);
 - Performance-based contracts.
- **Market Availability.** Contracting authorities should check for market availability of products that meet the GPP criteria or the criteria should be based on products available on the market. As the certification of a material is the most obvious proof that it is sustainable the public authorities must know the different certification schemes and standards such as ISO 14021 or equivalents, Global Recycle Standard, Plastica Seconda Vita and Remade in Italy (Italy), QA-CER

(Belgium), Intertek R-PET certification, Product Category Rules (PCR) for Environmental Product Declaration (EPD).

- **Verification systems.** Compliance with GPP criteria needs to be assessed during the contract execution phase and commissioning. Verification systems require submission of both existing documentations that the supplier has at their disposal and of specific documentation to be produced to prove compliance with an environmental requirement such as:
 - Evidence in the form of information and references related to relevant contracts;
 - Third party auditing;
 - LCA/Life cycle costing (LCC) analysis;
 - Monitoring data;
 - Management plan;
 - Design plan;
 - Modeling and test data;
 - Technical reports.

Tax on raw materials

In countries where a tax on raw materials has been introduced, the same goal is pursued - to promote the recycling of materials, to make recycling more economically viable and to reduce the rate of extraction of non-renewable resources. However, there are different practices regarding the way tax is introduced. When introducing the tax on raw materials, Croatia must decide regarding the types of the raw materials to be covered by the tax, entities liable to the tax, competent authorities should be involved in and what functions they should perform.

Taxable raw materials

Usually, the subjects of the tax on natural raw materials are materials that fall under different concession regimes in Croatia, for example:

- Sand and gravel extracted from renewable deposits - under Water Act, respectively Rulebook on the register of gravel and sand extraction¹⁷;
- Fossil fuels that could be used in construction materials (peat, asphalt), technical-building stone (amphibolite, andesite, basalt, diabase, granite, dolomite, limestone), construction sand and gravel from non-renewable deposits, construction sand and gravel from the seabed, brick clay; architectural-building stone – under Mining Act, resp. Regulation on the concession fee for the exploitation of mineral raw materials¹⁸.

The existing practice of registering the quantities subject to concession can serve as a basis for determining the quantity of taxable raw materials. If new materials are planned to be covered by the tax or other requirements are imposed on the taxable materials, the tax collection administration must have timely and reliable information on the taxable quantities. In Denmark, for example, taxable raw materials are materials that have either not been processed or have only been **subjected to single**

¹⁷ Pravilnik o očevidniku vađenja šljunka i pijeska (Urednički pročišćeni tekst, „Narodne novine“, broj 80/10 i 03/14).

¹⁸ Uredbu o naknadi za koncesiju za eksploataciju mineralnih sirovina.

processing. Single processing means sorting, crushing, air drying, or other simple processing. After the treatment, the raw material still appears as a raw material. It is only at the time when the raw material is included in the advanced process that the taxable quantity must be calculated and thus the tax settled: Any waste or waste in the form of water content from the time of extraction to the time of supply must therefore not be included in the taxable quantity.

In case a decision is made to include additional materials, it will be necessary to upgrade the existing registers or create a new information system. Any additional complication leads to incentivizing the replacement of more construction materials made from natural resources but complicates control and, accordingly, efforts are needed to increase the capacity of the administration. Before deciding on the scope of the taxable materials, a detailed analysis of the situation in the different regions in the country is needed. Afterwards, the waste information system should include an effective mechanism for tracing the path of the taxable materials.

Entities liable for paying the tax

There are different practices regarding entities liable for paying the tax. It is possible to tax only those who produce (e.g. Sweden), in which case only persons who are subject to a concession fee in Croatia will be covered. Another possibility is to include importers of aggregates (e.g. Denmark and the UK), thus placing importers and extractive companies on an equal footing. **Commercial extractors** of raw materials and **importers of raw materials** need to be registered. In Denmark, the **businesses, which use raw materials** in further processing (e.g. cement producers), are also obliged to pay tax on raw materials used in the production. To avoid double taxation of the same quantity taxable raw materials transferred to another company registered under the Danish Raw Materials Tax Act are not subject to taxation - the supplier must issue an invoice stating that the raw materials have been delivered free of charge.

Therefore, if a decision is taken to impose obligations on importers of raw materials and manufacturers that use raw materials, there will be a need to create a new information system that incorporates information from concession registers and permits and to establish new reporting obligations and procedures. When checking the reliability of the reported data, inspectors must distinguish between the excluded activities and the activities subject to taxation including distinguishing between waste and non-waste materials.

Exemptions

According to the experience of a number of countries where a tax on raw materials has been introduced, it is possible to introduce various tax exemptions, such as:

- Raw materials extracted for coastal projects to protect the beaches against erosive action;
- Seafloor materials, which originate from maintenance and capital dredging projects and which are utilized as raw materials;
- Residual products and waste products, which are extracted from already closed depots.
- Topsoil and mold;
- Raw materials commercially extracted or imported by a business, when the annual amount is less than 200 m³ of raw materials (Denmark);

- Cases where extraction is not formally considered as “raw material extraction” and hence liable for tax – e.g. when the removal of gravel is necessary for the completion of a road-building project;
- Recycled materials (if not commercially extracted again) and waste do not fall under the tax regime.

The information system and reporting procedures have to be designed in such a way to differentiate activities that are exempted from the scope of the tax. When checking the reliability of the reported data, inspectors must distinguish between the excluded raw materials and the materials subject to taxation.

Tax rate

Practice shows that in the countries that have introduced a tax on raw materials, the tax rate remains relatively constant. From 1990 until 31 March 2020, the tax rate in Denmark tax has been fixed to DKK 5 per m³ of raw material and with the strengthening of the concept of the circular economy the tax has increased from DKK 5.00 to DKK 5.27. Therefore, it is essential to determine the optimal level from the very beginning, which will effectively limit the extraction of natural resources and their replacement with recycled waste. Subsequently, the amount of the fee may be gradually increased with the introduction of new measures to increase the amount of recycled waste to meet the demand for alternatives to natural raw materials.

As the tax rate influences the rate of replacement of raw materials, before fixing the rate, an in-depth study should be carried out covering the conditions in the individual regions, availability of alternative quantities and measures envisaged by the Government to provide enough recycled waste quantities, prices of alternatives, expected financial impact, and environmental benefits.

Level of centralization

Usually, the tax on raw materials is applied on a national level but there are exceptions such as Italy where taxes are levied by municipalities and each region applies different tax rates at a provincial and municipal level. The decision on the degree of decentralization of the tax on raw materials will depend on its main purpose and which competent authorities are best prepared to administer the fee.

Taxable event

Depending on the decision on raw materials that will be covered and the persons that will be liable, the tax might be levied after the raw materials are commercially extracted, or commercially imported. Other options are also available. For example, in Denmark importers have the option of paying tax on the documented amount of raw materials used to produce the finished product cement using supplier and manufacturer declarations or analysis from an accredited institute. Similarly, Danish cement producers must provide documentation of the amount of raw materials used to produce cement. In Sweden, the tax liability arises when natural gravel is delivered to a buyer or when natural gravel is used for any purpose other than sale such as use in their own business, exchange and present.

It is necessary to decide on the documents certifying the tax event because this will determine the means of collecting and reporting data on the amount of taxable quantities or the methods of data reliability control.

Documentation

Usually, the taxpayers calculate the taxable amount by themselves and declare it to the tax authorities. Therefore, procedures will be needed to control and verify the accuracy of the declared data, in the form of on-the-spot checks and cross-checks with the data in other information systems.

Tax revenue collecting agency

Responsibility for the implementation/administration (tax collection) usually rests with the national tax authorities (Denmark, Sweden, the UK), but there are exceptions such as Italy where taxes are levied by municipalities. The competent authority in Croatia to be designated to administer the tax will also need to monitor the level of extraction, import, and/or first sale of raw materials and implement a range of penalties and interest for late payment, misdeclaration, non-compliance and evasion. As mentioned above, some competent authorities perform similar functions (collecting concessions for raw materials from non-renewable and renewable sources) but this activity can also be entrusted to national or local tax authorities or the Environmental Protection and Energy Efficiency Fund. The capacity of the selected tax administration authority should be strengthened in terms of exchange of information with other authorities (such as Customs), planning and carrying out inspections on the reliability of declared data (both inspecting documents and facilities) which requires knowledge of different types of raw materials and extracting technologies.

Use of revenue

Usually, the tax revenue forms part of the national budget but there are examples where the municipalities are the final beneficiaries. In most cases, there is no hypothecation of the tax for specific purposes. Usually, there are no compensatory measures for sectors extracting or using minerals with exceptions of the UK where the aggregate tax offsets a minor tax shifts a 0.1 percentage point reduction in employers' National Insurance contributions, and Italy where the law obliges municipalities to spend them on "compensatory investments" in mining areas.

In case a decision is made for the tax revenue to be part of the state budget, there will be no need for special rules and procedures for spending. However, if the revenue is used as compensatory investments in the mining sector or for funding of specific projects, then rules and procedures will be needed to assess applications for funding, distribution of funds and monitoring to ensure implementation of that approved measures.

4 Capacity building training topics and targeted stakeholders proposed for Croatia

The previous subsection identified areas where Croatia needs assistance in deciding on how to implement the selected policy options as well as areas where more specific training measures for strengthening the administrative capacity can be recommended. In the table below these capacity-building measures are summarized in a capacity-building and training plan which includes the identified existing and potential institutions for the implementation of the respective policy options, other stakeholders that should be invited to the training as well as a brief description of the identified training topics.

Identified need for Legal measures or guidance	Capacity building training topics	Obligated persons and persons affected by the policy option	Possible representatives of obligated persons	Competent authorities concerned
Pre-demolition audit, selective deconstruction and demolition reporting				
Exchange of information between investor and demolition contractor (Article 8 of the Ordinance ¹⁹)	<ul style="list-style-type: none"> • Procedure for performing pollutant and interfering substance investigation – different degrees of complexity (exhaustive, orientational, or not required) • Audit requirements in Standard demolition method (see task 4 and/or task 6) • Information system for tracking the path of the construction waste e.g., presentation of the EDM Austrian system • Requirements for selective deconstruction • Development of demolition recovery concept 	<ul style="list-style-type: none"> • Investors • Demolition contractors • Designers • Demolition Auditors • Academia 	<p>Croatian Chamber of Architects</p> <p>Association of Croatian Architects</p> <p>Croatian Association of Civil Engineers</p> <p>Faculties of Civil Engineering</p> <p>Faculties of Architecture</p> <p>Croatian Chamber of Commerce</p>	<ul style="list-style-type: none"> • Competent authorities responsible for approval of construction permits²⁰ • State Inspectorate, • Environmental inspectors • Building inspectors²¹

¹⁹ Ordinance on construction waste and waste containing asbestos (OG 69/2016).

²⁰ The application for building permit shall be submitted by the investor to the competent office for construction and physical planning in the place where construction or reconstruction works are planned. The application for a building permit is submitted by the investor to the competent administrative body of a large city (above 35.000 citizens), the City of Zagreb or the county, responsible for administrative affairs of construction, depending on the place where construction is planned.

²¹ The Building inspector at the construction site reviews the prescribed documentation on waste management as per the special regulations governing waste management. The Building inspector supervises the removal of the building with the treatment of construction waste, which must be in accordance with the removal project.

<p>Building demolition project (Article 76 of the Construction Act) and separation at source/selective deconstruction (Articles 9 - 13 of the Ordinance)</p>	<ul style="list-style-type: none"> • Procedures for confirmation of dismantling (different types depending on the complexity of the project) • Obligations for separation (per material, per subsequent treatment) • Control and enforcement good practices 		<p>Croatian Employers' Association-Construction Employers' Association</p> <p>Association of Craftsmen - Section of Builders</p>	
<p>Documenting and reporting of the demolition (Articles 13 - 15 of the Ordinance)</p>	<ul style="list-style-type: none"> • Waste classification (beyond European Waste Catalogue) and tracking the path of waste (example of Austrian CDW classification and EDM Information System) 	<ul style="list-style-type: none"> • Investors • Demolition contractors 	<p>Croatian Chamber of Commerce</p> <p>Croatian Employers' Association-Construction Employers' Association</p> <p>Association of Craftsmen - Section of Builders</p>	<ul style="list-style-type: none"> • Competent authorities responsible for approval of construction permits (e.g. city of Zagreb, county responsible for administrative affairs of construction) • State Inspectorate, • Environmental inspectors

Landfill tax				
Landfill tax structure	<ul style="list-style-type: none"> • Structuring of the landfill tax, including: <ul style="list-style-type: none"> ○ Different options and parameters for applying the fee ○ Effects on landfilled quantities ○ Administration of the tax ○ Exemptions ○ Use of the revenues from the tax ○ Examples from MS as France and Austria • Data validation and reliability of reported data including risk factors and planning of inspections (example - EDM Austria) • Appropriate new subcategories of landfills, indicators, test methods and limit values for characterizing additional waste properties (e.g. biodegradability) • Organizing the reporting to include information on the subcategory of the landfill, the presence of important components of the landfill, additional properties of the waste (e.g. biodegradability) – example EDM Austria • Tendering, evaluation and approval of projects for activities, which will be financed by the landfill tax revenues – (e.g. the involvement of banks in Austria) 	<ul style="list-style-type: none"> • Investors in construction works • Landfill operators • Operators of other CDW treatment facilities • Municipalities 	<p>Investors:</p> <p>Croatian Employers' Association-Construction Employers' Association</p> <p>Association of Craftsmen - Section of Builders</p> <p>Landfill operators and CDW treatment facilities: private or municipal companies</p>	<ul style="list-style-type: none"> • representatives of the Ministry of Economy and Sustainable Development • Environmental Protection and Energy Efficiency Fund • State Inspectorate, • Environmental inspectors • Competent authority for permitting waste management activities, waste classification (Ministry of Economy and Sustainable Development) • Waste information systems ²²: Ministry of Economy and Sustainable
Exemptions	<ul style="list-style-type: none"> • Waste activities for which taxation is not recommendable 			

²² The Ministry of Economy and Sustainable Development - **Sector for Sustainable Waste Management** performs activities related to the preparation and implementation of planning documents in waste management, waste information System, drafting regulations in the field of waste management, activities related to the establishment of waste management systems; issues permits, solutions and certificates for waste management and cross-border waste traffic.

	<ul style="list-style-type: none"> • Organizing the reporting to include information on the quantities of waste submitted for activities that are not subject to a landfill tax 			
Landfill tax rate and effects on other waste treatment	<ul style="list-style-type: none"> • Evolution of the amount of the Landfill tax rate (example – evolution of the rate in Austria) and effects on the landfilling • A good example of consultation with stakeholders concerned on the choice of treatment technology (example of consultation for the development of waste treatment technologies in Vienna) • Influence on the competition with the other treatment options, municipal waste fee, raw material (aggregates) taxes • Measures to combat the consequences – illegal dumping, C&D waste from household repairs, sham recovery 		<p>Association of Counties, Cities and Municipalities: Croatian Association of Counties, Associations municipalities in the Republic of Croatia, Association of Croatian Cities</p> <p>Croatian Chamber of Commerce, Association of municipal economy</p>	<p>Development - Sector for Sustainable Waste Management</p> <ul style="list-style-type: none"> • Waste information system for tracking hazardous waste and annual reporting: State Inspectorate, Environmental Inspection • Private financial institutions (banks) • NGOs
Landfill tax administration	<ul style="list-style-type: none"> • Know-how and experience for landfill tax administration - • control and verification of the accuracy of declared data • Funding of the landfill tax administration • Training the personnel of landfill tax authorities • Cooperation and exchange of information between waste management authorities and tax administration • Tailoring subsidies to follow EU state aid policy • Criteria and procedures for funding waste management projects • Experience in involving private financial institutions in evaluating projects and monitoring to ensure that approved measures are implemented. 			

Green Public Procurement				
GPP concepts for reducing environmental impacts	<ul style="list-style-type: none"> • Selection of materials – high performance and renewable • Design – assessment of the environmental performance of materials and buildings • Construction – minimize separate waste • Use - Installation of physical and electronic systems • Demolition – reuse, repurpose, recycle 	National, provincial and local authorities (as contracting authorities in GPP)		Green Public Procurement Commission (22 members representing relevant bodies ²³)
Needs Assessment	<ul style="list-style-type: none"> • Preliminary market and need assessment consultations • Drawing technical specifications (outcome vs. Input-based) • Estimating the total quantity or scope of the contract • Joint procurement approaches • Support for capacity building for the implementation of GPP criteria in the tendering process 	Road construction Office construction Civil engineering projects		
Process of procuring construction works and GPP criteria	<ul style="list-style-type: none"> • EU guidance documents on GPP criteria • Theoretical concept and terminology of EU GPP criteria • Examples of national/MS criteria for GPP on household building (beyond EU criteria) 			

²³ It consists of representatives of the ministry responsible for: the economy and entrepreneurship, the ministry responsible for the environment, the ministry responsible for finance, ministries in charge of agriculture, ministries in charge of transport, ministries responsible for construction, the ministry responsible for health, the Central State Office for Central Public Procurement, Croatian Association of Counties, Association municipalities in the Republic of Croatia, the Association of Cities of the Republic of Croatia, the City of Zagreb, Independent Croatian Trade Unions, Croatian Chamber of Commerce, Croatian Employers' Association, Fund for Environmental Protection, Croatian Business Council for Sustainable Development, Regional Energy Agency "northwestern Croatia" and the NGO DOOR.

	<ul style="list-style-type: none"> • Key stages of the construction process and GPP criteria related to them 			
Market Availability	<ul style="list-style-type: none"> • Certification schemes and standards • Online databases 			
Verification	<ul style="list-style-type: none"> • Documentation for verification of each GPP criteria 			
Tax on raw materials				
Taxable raw materials	<ul style="list-style-type: none"> • Possibilities for inclusion of raw materials that are not covered by the concession taxes • Organization of raw material quantity reporting on the basis of existing concession registries • Control and verification of reported data 	<ul style="list-style-type: none"> • Extracting industry • Importers of raw materials • Users of raw materials for production of construction materials (e.g. cement industry) 		<ul style="list-style-type: none"> • Competent authorities responsible for renewable and non-renewable concessions • Tax administration • Environmental Protection and Energy Efficiency Fund
Exemptions	<ul style="list-style-type: none"> • Activities and materials for which taxation is not advisable • Organize reporting so as not to include information on quantities submitted for non-taxable activities 			
Entities liable to raw material tax	<ul style="list-style-type: none"> • Registration of entities not liable to concession tax: importers, businesses, who use raw materials • Information system and data verification 			
Tax rate	<ul style="list-style-type: none"> • Factors on which the determination of the optimal amount of the fee depends 			
Tax administration	<ul style="list-style-type: none"> • Taxable event • Calculation of the taxable amount and declaration • Revenue collection options • Revenue use 			

Conclusion to capacity building program

The policy options preferred during the stakeholder consultation required either the creation of a new administration system (landfill tax, raw material tax) or necessitate decision-making on how to strengthen the capacity of existing institutional structures (pre-demolition audit, green public procurement). Prior to deciding on the approach for implementing the relevant practice, the recommendations for capacity-building and training may not be specific, as the study of international practice shows that approaches to implementing selected policy options from country to country are very different and a "typical" institutional setup cannot be determined. Therefore, on one hand this report aims to assist in choosing the specific manner for implementation of selected measures in Croatia and, on the other hand, to identify areas and specific problems that require training of the institutions that are currently implementing or will potentially implement a specific political option in the future.

Taking into account the international experience and the current situation, it was found that Croatia needs assistance in choosing the most appropriate way to implement **pre-demolition audit** by introducing certain types of pre-demolition investigations depending on the complexity of the sites (respectively the level of qualification of the investigator) in order to acquire the information referred to in Article 8 of the *Ordinance on construction waste and waste containing asbestos*. Other areas of assistance in decision-making could be the selection of the most appropriate approach for stricter implementation of the Building demolition project (required by Article 76 of the Construction Act) through introducing a demolition recovery concept and confirmation of dismantling (that could vary depending on the complexity of the project). As the competent authorities and demolition control procedures have already been regulated, specific training measures may be recommended on the requirements and documentation of pre-demolition investigation, requirements for selective deconstruction, obligations for separation (per material, per subsequent treatment), control and enforcement practices, documenting and reporting of the demolition.

It was identified that Croatia needs assistance in choosing the most appropriate manner to apply the **landfill tax** by explaining the advantages of different types of landfill tax structure (based on waste types, waste properties and types of landfill technologies), possible tax exemptions, the factors that determine the optimal rate of the tax, as well as the choice of measures to overcome the negative impact of landfill tax (waste "tourism", illegal dumping, "sham" recovery). More specific recommendations for training of potential competent authorities on the implementation of landfill tax are also possible, such as exchange of experience in organizing taxable quantity reporting, including measures so that the reporting reflects the structure of the tax; cooperation and exchange of information between waste management authorities and tax administration; control and verification of the accuracy of declared data; implementation of criteria and procedures for funding waste management projects including tendering, evaluation and approval of projects for activities, which will be financed by the landfill tax revenues; sharing experience in involving private financial institutions in evaluating projects and monitoring to ensure that approved measures are implemented.

The concept of **green public procurement** has already been introduced into Croatian law and practice. Therefore, capacity-building efforts could be focused on more specific training measures for using GPP procurement to reduce environmental impacts from construction works, acquiring deeper knowledge about construction works procuring process and existing GPP criteria suitable for the construction

sector, the possibilities for preliminary check for market availability of products that meet the GPP criteria, and verification for compliance with GPP criteria during the contract execution phase.

Raw material tax is not implemented in Croatia, but there is a certain experience in applying similar instruments – concessions on renewable and non-renewable minerals. These two types of fiscal instruments have different characteristics, and therefore support is needed in developing the concept of the raw material tax, as well as selection of taxable raw materials (including those not covered by existing concession legislation), identifying entities liable for paying the tax (other than the extractive industry), possible exceptions, exchange of experience on the factors related to the optimal amount of the tax, manner of identification of the taxable events by the tax administration, calculation of the taxable amount and its declaration, procedures for verification, revenue collection options, revenue use, etc.

Annex 1: Invitation to and agenda of the stakeholder meeting

Tuesday, 16 November 2021, 8:30 – 12:30 AM

Location: Hrvatske vode, Vukovarska 220 (Hall 28A, groundfloor)

– live and online participation –

Within the project "Technical Assistance to the Ministry of Economy and Sustainable Development in the field of Sustainable Waste Management – Transition to a Circular Economy", which is implemented in cooperation with the World Bank, an informal Stakeholder Consultation regarding the upcoming Action Plan on Construction and Demolition Waste and on introducing Circularity in the Building Sector will be organized.

The intention of the meeting is to provide a non-formal occasion for open discussion. After short presentations from the organizer's side a discussion session based on input questions will be held. PLEASE FIND THE PROVISIONAL LIST OF QUESTIONS AT THE END OF THIS AGENDA. You might want to familiarize with the questions in advance to ensure a productive and fruitful discussion.

The meeting will be a hybrid meeting, meaning that there will be a combination of physical presence and online participation. While representatives of administration, NGOs and interest groups are invited to participate physically, we suggest that representatives of individual companies participate online.

For registration please contact our national coordinator Mr. Darko BIZJAK, dabizjak@yahoo.com, who will also be available in case of any questions you might have.

PROVISIONAL AGENDA

TIME	EVENT	SPEAKERS
8:30	Registration	–
9:00	Opening words/introduction of the upcoming CE action plan	Representative of Ministry of Economy and Sustainable Development and The World Bank representatives
9:15	Snapshot presentation N° 1: The Construction Sector in the context of the EU Circular Economy Action plan	Ulrich KRAL (Umweltbundesamt/Environment Agency Austria)
9:35	Snapshot presentation N° 2: Circular Economy Approaches regarding Construction and Demolition Waste	Mihail ASENOV (Umweltbundesamt/Environment Agency Austria)
9:55	Snapshot presentation N° 3: The role of Green Public Procurement	Darko BIZJAK (Umweltbundesamt/Environment Agency Austria)
10:15	Q & A session	–

10:45	Coffee break	–
11:00	Collection of suggestions from stakeholders regarding the process of establishing the CDW Action Plan	(moderated discussion based on input questions)
12:00	Conclusions and Closing	Fritz KROISS (Umweltbundesamt/Environment Agency Austria)

– simultaneous interpretation will be provided –

(possibility of [ZOOM](#) participation)

Meeting ID: 920 0950 2713

Passcode: VXUKqn@BW8)

Initial list of input questions for the moderated discussion:

- What are currently the main barriers for higher rates of use of recycled construction material and broader use of more sustainable construction material and other components? How can investors and construction companies be motivated to make broader use of such material?
- What are currently the main barriers regarding more sustainable construction practices and more sustainable design of buildings?
- What would be needed to boost the development of private sector initiatives in the CDW sector (e.g. specialized companies upgrade their services for sorting, recycling, etc.)?
- How can communal waste management enterprises be motivated to upgrade above services?
- What initiatives should the government take in their role as buyer of construction and demolition services, e.g. importance of Green Public Procurement?
- Would you be ready to take part in pilot initiatives, e.g. research projects?
- What are currently the main shortcomings in Croatia in terms of infrastructure for recycling construction and demolition waste?
- What measures from the side of the central government would Regions need for higher recycling rates in CDW?
- What measures from the side of the central government would Municipalities need for higher recycling rates in CDW?
- What can be the role of NGOs and citizens to reduce quantities of unrecycled CDW?

Annex 2: Stakeholder meeting participation list

Please note that the participations list and contacts/email are subject to personal data privacy and shall only be used internally by the World Bank.

Stakeholder consultation on the upcoming Construction Waste Action Plan

Participation list

Please note that the participations list (names) and contacts/email due to personal data privacy are not here presented. Instead the list of organizations that were present is presented (some organizations were represented with more than one person):

Organization
Ministry of Economy and Sustainable Development
Ministry of Physical Planning, Construction and State Property
Civil Engineering Faculty
Croatian Chamber of Commerce
Urban Institute of Croatia d.o.o.
Center for Spatial Planning and Urbanism
Association of Cities/counties
Istrian County
Administrative Department for Sustainable Development
Association of Cities/counties
Croatian Railways Infrastructure
FLORA VTC d.o.o. Virovitica – komunalna tvrtka
EKONERG - Energy Research and Environmental
INTERSEROH d.o.o.
Eurofins Croatiakontrola d.o.o.
Head of the Department of Environmental Ecology
IND-EKO d.o.o.
STRABAG d.o.o.
EURCO d.d.
IGH
Director of the Department of Materials and Structures
INA, d.d.,
Sustainable development
Leading environmental specialist
Eko sustav d.o.o.
Croatian Association of Experts in Nature and Environmental Protection
Holcim d.d.
Croatia Cement
SAFEGE d.o.o. consulting
CE-ZA-R d.o.o.
Lesosio d.o.o.