

# Screening template for Construction and Demolition Waste management in Croatia V2 – September 2015



# Table of contents

<b>SCREENING FACTSHEET</b>	<b>3</b>
<b>1 Summary</b>	<b>3</b>
<b>2 Definitions concerning construction and demolition waste (CDW) and management</b>	<b>5</b>
2.1 Definition of waste	5
2.2 Definition of construction and demolition waste (CDW)	5
2.3 End of Waste (EoW) status	5
2.4 Definitions of waste treatment operations	6
<b>3 Legal Framework – Waste Management Plans and Strategies</b>	<b>6</b>
3.1 Legislation concerning CDW in Croatia	6
3.2 Waste management plans (WMP) and Strategies	8
3.3 Legal framework for sustainable management of CDW	10
3.4 Targets	11
<b>4 Non-legislative instruments</b>	<b>12</b>
<b>5 CDW management performance – CDW data</b>	<b>15</b>
5.1 CDW generation data	15
5.2 CDW treatment data	16
5.3 CDW exports/imports data	17
5.4 CDW treatment facilities data	17
5.5 Future projections of CDW generation and treatment	17
5.6 Methodology for CDW statistics	17
<b>6 CDW management in practice</b>	<b>19</b>
6.1 CDW management initiatives	19
6.2 Stakeholders' engagement	23
6.3 Waste legislation enforcement	24
6.4 Drivers/barriers to increase CDW recycling	25
<b>7 CDW sector characterisation</b>	<b>26</b>
7.1 Sector characteristics	26
7.2 Exports / imports of CDW	27
7.3 CDW as landfill cover	27
7.4 According to the desktop research and interviews, no information on this subject is available in official statistics. Market conditions/costs and benefits	27
7.5 Recycled materials from CDW	27
7.6 Construction sector make up	27
<b>REFERENCES</b>	<b>29</b>

# Screening factsheet

## 1 Summary

### CDW management national performance

Waste category	Quantity generated in 2012 (tons)
Soil	358,916.00*
Other inert waste	126,105.62*
<b>Total inert waste</b>	<b>485,021.62</b>
<b>Non-inert non-hazardous waste</b>	<b>180,052.38</b>
<b>Hazardous waste</b>	<b>16,984.00</b>
<b>Total CDW</b>	<b>682,058.00</b>

Summarised data received from the Croatian Environmental Agency.

\* Since the distribution between soil and other inert waste produced is not available, these figures were estimated considering that the generated soil correspond to the treated soil (recovery/recycling + landfill)

In 2012 682,058.00 tons of construction and demolition waste (CDW), in sector NACE F, were officially reported as generated in Croatia. This represents a slight increase (0.12 %) compared to 2011 (681,214.93 tons). The figures above represent the official Croatian CDW statistics and correspond to the figures reported by Eurostat.

As per data provided by the Croatian environmental agency total amount of waste generated in 2012 including total amount notified as produced or imported to or out of Croatia was 717.382,40 tons.

### CDW management practices

Data on CDW management practices could not be obtained from the national statistics, but was estimated based on the data provided by the Croatian Environmental Agency for the entire treatment of the all types of waste. The relevant data is provided in the table below.

CDW treatment data (2012)	Energy recovery	Incineration	Recovery other than energy recovery*	Backfilling	Landfill	Land treatment and release into water bodies	Total waste treatment
<b>Non-hazardous waste</b>	1 %	0 %	32 %	1 %	65 %	0 %	100 %
<b>Hazardous waste</b>	11 %	0 %	74 %	0 %	14 %	0 %	100 %

Croatian Environmental Agency (CEA)

Please note that data on CDW management practices was estimated based on total waste management treatment for 2012.

\* Except backfilling

In terms of the CDW management practices in 2012, the following conclusions can be made:

- Most of the non-hazardous waste was deposited onto or into land (around 65 %) or recovered otherwise (R2, R3, R4, R5, R6, R7, R8, R9, R10) than through energy recovery and backfilling (32 %). Energy recovery and backfilling still represent a very small part of the overall CDW treatment practices (around 1 %).
- Most of the hazardous waste (74 %) was recovered otherwise than by energy recovery, followed by depositing it onto or into land (14 %) and energy recovery (11 %).

Insight into the CDW management system in Croatia reveals that the relevant legislative and governance frameworks have been set, but that there is still room for improvement, especially in terms of reporting on the waste actually generated and reported. There are still limited non-legislative instruments in place promoting sound CDW management and enforcing the relevant legislation. As per stakeholders' interview there are still relatively low level of educational and awareness raising activities undertaken by all relevant stakeholders as well activities of promotion of use of environmentally friendly building materials. There is still a low number of CDW treatment facilities whose distribution should be planned according to locations where enough CDW quantities are accumulated, otherwise the CDW management becomes very risky and cost inefficient.

### **Main obstacles and drivers to sustainable CDW management**

- Legislation and regulation:
  - Clear CDW recycling policies or rules are yet to be defined and implemented, including legal provisions regarding the enforcement of the CDW legislation. The current human and financial resources seem insufficient.
- Treatment facilities and their territorial network:
  - There is a need for more (organized) CDW collection sites, there are still insufficient selective separation facilities in place and most CDW is disposed in regular solid-waste landfills (around 50 % according to the data from the Croatian Waste Management Strategy). The latter is reflected through high transportation and disposal costs.
- Collecting and tracking data about generated and treated CDW:
  - There are still a number of wild landfills, as indicated by large unreported quantities of waste.
  - As per stakeholders' interview, the owners/producers still demonstrate a low culture of reporting and managing CDW, partly also due to the applicable fees in the area.
  - In addition, the CDW generation data correspond to the sum of the data declared by the waste producers/holders and not to a national estimation based on the reported data
- Public awareness:
  - Lack of interest in not only CDW waste management, but the waste management in general, with relatively scarce CDW-specific information, brochures and education. A higher engagement by all stakeholders is needed.
- Public procurement:
  - There are no specific initiatives around public procurement to support the use of recycled materials from CDW or environmentally sound materials.
- Market conditions
  - Market prices and operating costs of CDW sorting, recovery and recycling are still considered too high according to the stakeholder interviews.

### **Main drivers to sustainable CDW management**

- Legislation and regulation:
  - Activities around amending the strategic documents and regulation are notable, as well as enhancing the overall engagement of national authorities. In this view, the Croatian Government will soon introduce new CDW rules providing a more detailed and a clearer definition and explanation of the regulation.
- EoW criteria
  - A total of 7 special EoW status requirements have been established for seven CDW types in Croatia insofar.
- Treatment facilities and their territorial network:
  - National strategic programmes and EU funding priorities promote the establishment of treatment facilities. The latter can be used to develop a territorial treatment facility network that would include sites with sufficient CDW quantities to reduce the potential environmental hazard risk and high CDW management costs.
- System monitoring:
  - Strong engagement of the Croatian Environmental Agency in improving the system based on the announced changes to the data management system. The focus is on improving CDW data quality as well as data on waste generated in the process of exploration and exploitation of mineral resources in the Republic of Croatia currently featuring a low rate of statistical reporting.

Undoubtedly, one of the key drivers to sustainable waste management will be the actual and continuous implementation of the guidelines for CDW management system improvement set in the Waste Management Strategy (2005 – 2025), outlined in details in Section 3.2.

## 2 Definitions concerning construction and demolition waste (CDW) and management

This section details the definitions of waste used in Croatia.

### 2.1 Definition of waste

The definition of waste in Croatia complies with the definition of waste in the Waste Framework Directive 2008/98/EC (WFD). According to the Act on Sustainable Waste Management (Croatian Official Gazette ('OG') no 94/13 - 2013): 'Waste is any substance or object which the holder discards or intends or is required to discard. As waste is considered to be any substance or object whose collection, transport and treatment are necessary for the purpose of public interest protection.'<sup>1</sup>

### 2.2 Definition of construction and demolition waste (CDW)

According to The Rules on construction waste management (OG 38/08) of 28 March 2008 (hereinafter: 'the Rules'), Construction and demolition waste ('CDW') is defined as 'Waste resulted from building construction, reconstruction, demolition/removal and maintenance of existing buildings, as well as from excavated materials, which cannot be used, without the pre-recovery, in the construction of buildings for which construction is formed.'<sup>2</sup>

There is no clear distinction between construction and demolition waste provided by the two definitions although the above-cited article of the Rules distinguishes CDW by the different sources of origin.

The CDW classification in Croatia, provided in the *Rules on waste catalogue* (OG 90/15) of 3 August 2015, is in line with the European List of Waste (LoW) (2000/532/EC).

Please note that the Rules from the previous paragraph do not apply to code 17 06 'Insulation materials and asbestos-containing construction materials' and code 17 09 'Other construction and demolition waste' (construction and demolition waste containing hazardous content such as mercury, PCB, etc.). These codes are governed by separate Rules on the method and procedures for managing waste containing asbestos (OG 42/07) of 16 April 2007 and The Rules on managing waste from research and mining of mineral raw materials (OG 128/08) of 31 October 2008.

Waste from excavated materials, which cannot be used, without the pre-recovery, in the construction of buildings for which construction is formed, is also a part of the CDW definition.

The non-construction waste is included in the current CDW definition and is therefore contained in the statistical reports. [Waste statistical reports are compiled in line with Eurostat methodology.](#)

### 2.3 End of Waste (EoW) status<sup>3</sup>

The criteria for End of Waste (EoW) are defined in Article 15(2) of the Act on Sustainable Waste Management (OG 94/13) of 18 July 2013 and are consistent with the European criteria for EoW status.

The Rules on by-products and end-of-waste status (OG 117/14) entered into force on 9 October 2014. Special requirements for CDW in Croatia are stipulated in Annex V<sup>4</sup> of the Rules on by-product and EoW status. Special EoW status requirements have been established for seven CDW types by reference to recovery activities for the manufacture of building products:

- concrete, bricks, tiles and ceramics;
- wood, glass and plastic;
- bituminous mixtures;

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<sup>1</sup> Croatian Parliament (2013), "Act on Sustainable Waste Management", Article 4 Item 35.

<sup>2</sup> Ministry of Environmental Protection (2008), Spatial Planning and Civil Engineering, Article 3 of The Rules on construction waste management.

<sup>3</sup> Ministry of Environmental and Nature protection (2014), Rules on by-product and EoW status.

<sup>4</sup> Ministry of Environmental and Nature protection (2014), Annex V of the Rules on by-products and EoW status.

- coal tar and tarred products;
- soil (including excavated soil from contaminated sites), stones and dredging spoil;
- insulation materials and asbestos-containing construction materials, gypsum-based construction material;
- other construction and demolition wastes.<sup>5</sup>

The above-mentioned rules define the EoW criteria for waste resulting from recovery which are as follows:

- Waste generated by recovery can qualify for the end-of-waste status if it fulfils the prescribed requirements as determined in accordance with the special regulations governing construction products.
- The end-of-waste status is generated by selling the waste to another person or in case when a person who recovered it is also the one using it.

According to the information provided by the interviewed stakeholders, the amounts of waste that comply with the EoW status are not included in the CDW generation reporting (statistics). Nevertheless, they should be included in the future. Prior to adoption of the Rules regulating EoW, such material was reported as waste. In the Rules it is foreseen to report on quantities on annual basis (this quantities will be added to recycled quantities). Draft rules establishing the EoW status criteria, in line with the European ones, for aggregates derived from CDW and waste from public works for the use in road applications are being prepared.<sup>6</sup>

## 2.4 Definitions of waste treatment operations

Pursuant to Article 4 of the Act on Sustainable Waste Management (OG 94/13 – 2013), the following definitions apply:

- Reuse is 'any procedure that allows the re-use of products or parts of products which are not waste, for the same purpose for which they were originally made'.
- Recycling is 'any procedure for recovery, including recycling of organic material, which waste materials are processed into products, materials or substances for the original or purpose other than the use of waste for energy purposes, or processing of the material that is used as fuel or backfill material'.
- Recovery is 'any process whose main result is the use of waste in good purpose, when waste is replaced by other materials that would otherwise be used for this purpose, or waste being prepared to fulfil that purpose, at the factory or in the broader economic sense'.

These definitions comply with the categorization provided in Annex II of WFD.

As per stakeholder interview, the official Croatian CDW statistics does not include backfilling. According to the above-mentioned article of the Act on Sustainable Waste Management: 'Backfilling is the recovery procedure in which the appropriate waste is used for filling the excavated area or for technical purposes in landscaping and by which the waste is used as a substitute for non-waste material, pursuant to the relevant Act and to the regulations made under the Act'.

## 3 Legal Framework – Waste Management Plans and Strategies

In this section the legal framework governing CDW management in Croatia is explored.

### 3.1 Legislation concerning CDW in Croatia

CDW is governed by a general legislative framework on waste, rules i.e. ordinances related specifically to CDW as well as different aspects of CDW, i.e. The Rules on the method and procedures for managing waste containing asbestos (OG 42/07) and The Instructions on handling waste containing asbestos (OG 89/08).

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<sup>5</sup> Ministry of Environmental and Nature protection (2014), Annex V of The Rules on by-product and EoW status.

<sup>6</sup> Croatian Employers' Association.

The relevant legislation governing various aspects of CDW management is outlined below and is in line with the European WFD which was officially transposed into the Croatian law.

#### The Act on Sustainable Waste Management (OG 94/13)

According to Article 4(1)(13) of the Act on Sustainable Waste Management: 'Waste Management includes collection, transport, recovery and disposal and other waste treatment, including control over these procedures and supervision and measures to be implemented in locations after the disposal of waste and the actions taken by management trader or broker'.

The Act contains stipulations on general waste management, and CDW is regulated specifically in Article 53 which defines it as a special waste category. Moreover, the entire Article 58 relates to CDW and defines CDW disposal fees. Article 59 governs CDW containing asbestos, stipulating different aspects of managing asbestos-containing CDW. Furthermore, the Article also defines the roles and responsibilities of various stakeholders in this area.

#### The Rules on construction waste management (hereinafter: 'the Rules') (OG 38/08)

- The Rules on construction waste management came into force on 4 April 2008 and prescribe in detail various aspects of CDW management. Please note that the provisions of the Rules do not apply to asbestos-containing CDW and excavations which are governed by regulations on managing mineral resources.
- The Rules provide definitions of key elements of a comprehensive CWD management system and prescribe in more details the roles and responsibilities of the stakeholders with respect to the disposal, selection, recovery, etc.
- New rules on construction waste management are being prepared and should elaborate further, among others, the different aspects of CDW recovery, promotion of CDW management which are not detailed in the existing rules.

*Rules on waste catalogue (OG 90/15)* This regulation contains general information about categories, types and classification of waste, including CDW.

#### The Rules on the method and procedures for managing waste containing asbestos (OG 42/07) and Instructions on handling waste containing asbestos (OG 89/08)

These Rules regulate the method and procedure for preventing environmental pollution by asbestos as well as methods and procedures for managing asbestos-waste and asbestos-containing waste. The aim of the Rules is to determine measures for preventing and reducing pollution by asbestos and establish an asbestos-containing waste management system in order to protect human health and the environment in accordance with the Rules and other health and environment protection regulations.<sup>7</sup>

There is still no specific legislation concerning the different aspects of CDW management (prevention, re-use, recycling, recovery, landfilling – conditions, diversion – exports, infrastructure facilities, backfilling operations). However, the above-mentioned Rules address them to a limited extent. No obligations for recycling of CDW and no bans/restrictions regarding landfilling of recyclable CDW have been defined.

The hazardous waste fee is calculated and paid according to the produced and unprocessed not exported hazardous waste and the waste characteristics. The calculation formula is as follows<sup>8</sup>:

$$N = N_1 \times P \times k_k$$

Where:

**N** – the amount of the hazardous waste fee in Croatian kunas;

**N<sub>1</sub>** – fee per ton of produced and unprocessed or non-exported hazardous waste (hereinafter: 'the unit charges');

**P** – quantity of produced and unprocessed or non-exported hazardous waste in a calendar year; and

**k<sub>k</sub>** – adjustment coefficient dependent on the characteristics of hazardous waste.

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<sup>7</sup> Ministry of Environmental and Nature protection (2007), Rules on the method and procedures for managing waste containing asbestos.

<sup>8</sup> Environmental Protection and Energy Efficiency Fund, Charges for burdening the environment with waste.

### 3.2 Waste management plans (WMP) and Strategies

On **the national level**, two relevant waste management development frameworks are in force: the Croatian Waste Management Strategy for the period 2005–2025 and the related Waste Management Plan for the period 2007–2015.

#### a) Croatian Waste Management Strategy (hereinafter: ‘the Strategy’)<sup>9</sup>

The Croatian Waste Management Strategy was adopted on 14 October 2005 and is defined for the period 2005–2025. The strategy includes the assessment of the current situation, main waste-management objectives and measures, hazardous-waste management measures and guidelines for the recovery and disposal of waste.

The Strategy also tackles the area of CDW in two separate sections (2.3.2. and 4.2.2) and provides an overview of the current state of CDW in Croatia as well as guidelines for the CDW management system improvement. These guidelines are as follows:

- Educate and inform all participants in the process of construction waste management,
- Prevent uncontrolled disposal of construction waste at municipal landfills and elsewhere,
- Completely control the flow of construction waste from waste to final execution, with the improvement of information systems,
- Introduce systems of recovery of all types of construction waste to 80 % of the total amount,
- Encourage the use of environmentally friendly building materials,
- Implement construction waste management regulations, specifically:
  - the obligation of planning construction waste management after removal of buildings; and
  - the obligation of planning other construction debris, together with the existing one on the building site;
- Perform a review, at the county level, of all landfills used for construction waste disposal based on the analysis of data about all landfills, dumps used for inert waste, and the other restored and closed landfills;
- Ensure recovery and/or recycling of maximum construction waste quantities to produce new building material equal with other construction materials;
- In the Zagreb County and Zagreb City territories open landfills for inert waste, separately or along with municipal landfills, typically found within waste management centres, with treatment plants, mobile or stationary; during the transitional period sections of municipal landfills may be used only for classified and recovered construction waste required for landfill sections /as approved by the competent authority/;
- Improve the system for separate collection and recycling of certain types of construction and demolition waste and establish centers for the recovery and disposal of construction waste.

#### b) Croatian Waste Management Plan (WMP)<sup>10</sup>

The Croatian WMP for the period 2007–2015 was adopted on 19 July 2007, with the WMP for the period 2015–2021 currently being developed. The 2007–2015 Waste Management Plan was adopted in July 2007 and amended in November 2010 and March 2011. The main objective of the plan is to support the implementation of the main Strategy goals (set for the period 2005–2025). Specifically, the outcomes of the Plan implementation should be as follows:

- Establishment of the waste management system in each of the Croatian counties, following the regional/county level concept,
- Increase in the amount of separate collection of waste,
- Increase in re-use and recycling of waste,
- Pre-treatment of waste before final disposal,

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<sup>9</sup> The Croatian Parliament (2005), Croatian Waste Management Strategy

<sup>10</sup> Ibid.

- Reduction of the share of biodegradable waste in municipal waste,
- Extraction of refused derived fuel (RDF),
- Reduction of quantities of waste deposited on landfills,
- Reduction of adverse impacts of waste on the environment,
- Self-sustainable financing of the municipal waste management system.<sup>11</sup>

The WMP also tackles the aspect of CDW management through three separate sections (4.6.7., 5.4.4. and 6.7.1.2.). Namely, the WMP provides some general information on the CDW in Croatia, i.e. definition, types, estimated quantity for period 2001-2005, disposal facilities, etc overall CDW management - disposal, prevention and treatment as well as information on calculation of CDW disposal. In this view, the disposal price will depend on waste type, whether it is selected and on how many waste types CDW contains. The anticipated charge for CDW acceptance in recycling facilities will around 5–15 €/t.

Furthermore the Plan provides guidelines for management of the newly-generated (future) CDW indicating that “each individual or several local self-government units must determine a site for temporary deposition of construction waste from which all reusable materials will be previously separated. Temporary deposition of such wastes will be carried out in a transfer station and/or a recycling yard. The Plan also indicates that the existing construction waste should be managed either by permanent disposal of total construction waste to the related landfill by rehabilitation of the existing landfill, or by partial or total disposal of construction waste to temporary landfills or within the framework of plants and facilities used for construction waste recovery or recycling.

Finally, the plan strongly encourages CDW recovery and recycling as well as the ‘development of guidelines for building project engineering aimed at a more specific and appropriate use of environmentally sound materials (e.g. non-hazardous materials, selective disassembly, recyclable materials, etc.) and avoidance of any new construction waste.’

Croatia has not yet developed its national Waste Prevention Master Plan. It is envisaged to form a part of the new WMP for the period 2015–2021 and, according to the provided information, it will contain a section specifically governing CDW, consistent with the applicable EU directives. General waste prevention is currently regulated by the two documents mentioned above, as well as by the Act on Sustainable Waste Management.

**On the local level**, counties, the City of Zagreb and other cities and municipalities have the obligation to develop and adopt their own WMPs for an eight-year period. Policies/measures are developed within the Waste Management Plan of each county in Croatia, in accordance with Croatia’s Waste Management Plan for the period 2007–2015. According to Article 11 of the Rules, the counties as well as the City of Zagreb have to identify locations for managing construction waste on their respective territories. The City of Zagreb and other local self-government units have to ensure acceptance of construction waste originating in their territories by recycling facilities.

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<sup>11</sup> Croatian Audit State Office (2014), Audit Report on Waste Management Efficiency in Croatia

### 3.3 Legal framework for sustainable management of CDW

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
<i>National/regional obligation for selective demolition?</i>	No.	N/A	N/A
<i>National/regional sorting obligation (on-site or in sorting facility)?</i>	No.	N/A	N/A
<i>National/regional separate collection obligation for different materials (iron and steel, plastic, glass, etc.)?</i>	Yes.  The Act on Sustainable Waste Management: - Article 35 defines the obligation of separate collection of paper, metal, glass, plastics and textile, as well as the bulk municipal waste. <u>Units of local self-government</u> are responsible for the collection. - Article 54 (2): 'By 1 January 2015 the Republic of Croatia will provide, by the competent authorities, separate collection of the following types of waste: paper, metal, plastic and glass, WEEE, waste batteries and accumulators, waste vehicles, waste tires, waste oil, waste textiles and footwear and medical waste.'	2013., OG 94/13	<a href="http://narodne-novine.nn.hr/clanci/sluzbeni/2013_07_94_2123.html">http://narodne-novine.nn.hr/clanci/sluzbeni/2013_07_94_2123.html</a>
<i>Obligation for separate collection and management of hazardous waste from C&amp;D operations? Please specify</i>	Yes.  Asbestos is considered as a special CDW category and, being hazardous waste, it needs special treatment and disposal activities. Accordingly, special law regulations are developed. The obligation does not concern any other hazardous waste.	Regulation on waste management containing asbestos (2007). Instruction on waste management containing asbestos (2008)	- Regulation on waste management containing asbestos (2007); URL: <a href="http://narodne-novine.nn.hr/clanci/sluzbeni/297825.html">http://narodne-novine.nn.hr/clanci/sluzbeni/297825.html</a> , - Instruction on waste management containing asbestos (2008), URL: <a href="http://narodne-novine.nn.hr/clanci/sluzbeni/340442.html">http://narodne-novine.nn.hr/clanci/sluzbeni/340442.html</a>
<i>Related Green public procurement requirements</i>	No.	N/A	N/A

### 3.4 Targets

The only national target concerning CDW is consistent with WFD target and defined in Article 55(2) of the Act on Sustainable Waste Management as **70 % of the CDW mass to be recovered and recycled** By 1 January 2020 the Republic of Croatia shall take measures via its competent authorities to ensure the preparation for re-use, recycling and other material recovery of nonhazardous construction waste, including the backfilling and spreading of waste, when such waste is used in place of other materials, excluding the material from nature specified under waste code 17 05 04 – soil and stones other than those mentioned in 17 05 03 .').

The calculation of the CDW target is in line with the Commission Decision 2011/753/EC on the establishment of rules and methods of computation for checking compliance with the objectives of Article 11(2) of Directive 2008/98/EC of the European Parliament and of the Council.

Some other targets on national/regional level concerning CDW recycling or prevention, or selected materials from CDW, are not defined, but are presumably to be further elaborated and defined by the 2015–2021 WMP. As already mentioned in Section 2.3.2, the specific target for the CDW recovery is provided by the Waste Management Strategy which defined the objective to implement systems for the recovery of 80 % of all types of construction waste.

## 4 Non-legislative instruments

This section highlights any other instruments that may specify how the country is addressing the issue of CDW Management, especially as a preliminary overview for Task 3, as these instruments might create conditions for a sustainable management of CDW.

### Key waste management and sustainable building non-legislative instruments

Description	Level of occurrence (Yes/No) Key Scope/Exemptions	Year established and policy reference	Further detail, information source, related web-site
<i>Fees to cover the costs of managing CDW containing asbestos</i>	Yes.  This objective aims to stimulate responsible asbestos-containing CDW management by those possessing the license to collect CDW, codes 17 06 01* and 17 06 05* and having concluded a contract with the Environmental Protection and Energy Efficiency Fund. The mentioned fund pays a fee aimed to stimulate relevant stakeholders to collect, transport, permanently dispose and treat asbestos-containing CDW accepted from individuals/natural persons. The fees paid are as follows: <ul style="list-style-type: none"> <li>▪ HRK 2 per kg of collected CDW that contains asbestos</li> <li>▪ 1 HRK/t per km of the CDW containing asbestos transported from the place of origin to the landfill. The fee also covers the amount of tolls and other transportation related expenses.</li> <li>▪ Fee to compensate for packaging used to place the waste within.</li> </ul>	2013	<a href="http://www.fzoeu.hr/hrv/pdf/ODLUKA%20o%20visini%20n aknada_azbest2012.pdf">http://www.fzoeu.hr/hrv/pdf/ODLUKA%20o%20visini%20n aknada_azbest2012.pdf</a>
<i>Refund</i>  <i>The Act on Sustainable Waste Management – 2013, Article 66</i>	Yes.  Refunds are stimulating for the holders of waste, as they encourage them to deliver specific waste to the producer of a product being the origin of waste or the person managing a recycling yard in exchange for the refund.  The refund system is regulated by the Environmental Protection and Energy Efficiency Fund, but the amount refunded can vary, with no information about the rates being available.	2013	<a href="http://narodne-novine.nn.hr/clanci/sluzbeni/2013_07_94_2123.html">http://narodne-novine.nn.hr/clanci/sluzbeni/2013_07_94_2123.html</a>
<i>Sustainability standards that cover CDW (e.g. BREEAM)</i>  <i>LEED, BREEM, DGNB</i>	Yes.  Croatia's Green Building Council organizes a specialized training 'Green Building Professional', with a part of the module addressing green building certificates (LEED, BREEAM, DGNB)  Zagrebačka Banka offers a consumer credit for funding the Green Building Professional training.	N/A	<a href="http://www.zelenazona.hr/home/wps/wcm/connect/zelenazona/gospodarstvo/zeleni_poslovi/medunarodni_certifikati_zelene_gradnje">http://www.zelenazona.hr/home/wps/wcm/connect/zelenazona/gospodarstvo/zeleni_poslovi/medunarodni_certifikati_zelene_gradnje</a>
<i>Extended producer responsibility scheme in operation?</i>	No.	N/A	N/A

Key CDW management requirements and standards.

Description	Occurrence (Yes/No) Mandatory (Yes/No) Scope & exemptions	Year established	National or regional (specify if regional)	Details of Public sector and Industry enforcement/ involvement/ collaboration	Levels of performance e.g. tonnes recycled, % coverage	Further information/ website
Requirement for pre-demolition audits	No.	No.	No.	No.	No.	No.
Standards for recycled CDW	No.	No.	No.	No.	No.	No.
Selective demolition/ plan for large demolition sites/demolition standard	No.	No.	No.	No.	No.	No.
Other CDW planning requirements	No.	No.	No.	No.	No.	No.
<i>Fees to cover the costs of managing CDW containing asbestos</i>	Yes.	2013	National	Please refer to table <i>Key waste management and sustainable building non-legislative instruments for further details.</i>		<a href="http://www.fzoeu.hr/hrv/pdf/ODLUKA%20o%20visini%20naknada_azbest2012-pdf">http://www.fzoeu.hr/hrv/pdf/ODLUKA%20o%20visini%20naknada_azbest2012-pdf</a>

The Act on Spatial Planning and Construction requires obtaining a licence to perform any type of demolition. Exemptions apply to building sized no more than 400 m<sup>2</sup>, buildings for agriculture activities sized no more than 600 m<sup>2</sup> and simple buildings. Before demolition, a licensed architect or construction engineer needs to prepare a demolition study which, among others, must include drawings, calculations and/or other engineering evidence proving that the demolition will not affect the stability of structures to the extent that might endanger human life and health, or the environment.

### Key CDW management other guidance and tools

Description of guidance/ tool	Scope	Year established/ produced	National or regional (specify if regional)	Public sector and/or Industry lead organisation	Levels of use (high/medium/low) or specify	Further information/ web-site
Waste Statistics Manual – general waste manual, but also applicable to CDW Statistics.	User data collection and processing of the statistics about the waste origination and treatment.	2014	Both.	Industry-lead organisation.	N/A	<a href="http://www.azo.hr/Otpad">http://www.azo.hr/Otpad</a>

### Key technical guidelines/Codes of Practice for use of CDW in construction application

Description of guidance/ tool	Scope	Year established/ produced	National or regional (specify if regional)	Public sector and/or Industry lead organisation	Levels of use (high/medium/low) or specify	Further information/ web-site
No.	No.	No.	No.	No.	No.	No.

There are no specific CDW prevention policies and tools or specific private sector initiatives currently in Croatia.

Specific requirements for managing hazardous CDW in Croatia are defined according to specific types of hazardous CDW, e.g. asbestos waste management is regulated by the two already mentioned documents, The Rules on the method and procedures for managing waste containing asbestos (OG 42/07) and Instructions on handling waste containing asbestos (OG 89/08). Requirements for non-hazardous waste also apply to other types of hazardous waste.

## 5 CDW management performance – CDW data

The performance of CDW management in Croatia is explored in this section which particularly seeks to gather all available data and information about CDW generation and treatment, exports/imports, and CDW treatment facilities in Croatia.

The details of the CDW collection methodology are provided in Section 5.6. 'Methodology for CDW statistics', as the methodology is common for the data provided further below. The authority responsible in Croatia for collecting CDW data is the Croatian Environmental Agency ('the CEA').

In monitoring the data, CDW should be identified by reference to all Economic Activities (NACE). However, since this is almost impossible under the present system of reporting, the best alternative is to collect data about F-Sector waste (Construction sector according to NACE).

Data on waste generated by the relevant industries/sectors is also provided in the relevant statistical reports, but by the statistical categories defined in Annex III of the Waste Statistics Regulation rather than by key codes used for the CDW waste..

CDW origination estimations are very different because of the poor quality or incomparability of available data for the various methods of data collection.

There are still no precise controls over CDW quantities and structures, and large CDW masses remain misreported. There are also not many treatment facilities. Their network should be planned according to CDW origination sites. Otherwise, CDW management remains highly risky and cost inefficient.

### 5.1 CDW generation data

For the purpose of the Waste Statistics Regulation (WSR) reporting for 2011 (exceptionally for the purposes of the IPA Multi-beneficiary Statistical Co-operation Programme) and 2012 (regular reporting year) as well as for the purpose of calculating the amount of waste produced, the CEA also used waste collection and treatment data reported by waste treatment companies (PL OPKO forms) and included in the Environmental Pollution Register (EPR database), which is also transferred to Eurostat in accordance with the WSR.

Pursuant to the WSR, the next reporting year is 2014. This means that the 2013 data were not processed as described above.

Nevertheless, as per data provided by the Croatian environmental agency total amount of waste generated in 2011 including total amount notified as produced or imported to or out of Croatia was 579.239,63 tons, 717.382,40 tons in 2012 and 872.781,59 tons in 2013.

Data listed in the table below were provided by the CEA and collected from the Manual on evaluation and calculation of waste from individual sectors (NACE F – Construction sector). According to the CEA, these are official CDW data for Croatia, which were also delivered to Eurostat. The CEA representatives provided only the data for 2011 and 2012.

Official CDW generation data (Tonnes)*	2008	2010	2011	2012
Inert waste	93,910.00	5,107.00	483,662.60	485,021.62
Non-inert non-hazardous waste	34,862.00	1,896.00	190,328.10	180,052.38
Hazardous waste	451.00	653.00	7,224.23	16,984.00
<b>Total CDW</b>	<b>129,223.00</b>	<b>7,656.00</b>	<b>681,214.93</b>	<b>682,058.00</b>

Croatian Environmental Agency

\* Split between inert waste and non-inert non-hazardous waste for other years is an estimate prepared based on 2012 data.

## 5.2 CDW treatment data

The table below summarizes CDW treatment data by different treatment activities in 2012. Data specific for CDW management practices were not obtainable from the national statistics, but were estimated based on the data provided by the Croatian Environmental Agency for the overall treatment of the all types of waste and represent the data reported to Eurostat pursuant to the WSR.

The CDW treatment statistics cover each type of CDW. Data are gathered by sectors (NACE F).

According to the WSR, the next reporting year is 2014. Therefore, the 2013 data were not processed as described above.

The practice of CDW pre-treatment activities (mechanical sorting, biological treatment, physic-chemical treatments) is not followed in Croatia. According to the provided information, waste originating from construction or demolition is disposed on the site (heaped together) or is immediately covered. In addition, CDW is not treated/recycled on the site and no such data exist.

CDW treatment data (2012)	Energy recovery	Incineration	Recovery other than energy recovery*	Backfilling	Deposit	Land treatment and release into water bodies	Total waste treatment
<b>Non-hazardous waste (tones)</b>	6.352	10	192.309	8.645	390.340	1.143	598.798
<b>%</b>	1%	0%	32%	1%	65%	0%	100%
<b>Hazardous waste</b>	1.161	0	6	0	7.575	0	8.742
<b>%</b>	13%	0%	0%	0%	87%	0%	100%

Croatian Environmental Agency (CEA)

Please note that data on CDW management practices was estimated based on total waste management treatment for 2012.

\* Except backfilling

Data listed in the table above were provided by the CEA and collected from the Manual on evaluation and calculation of waste from individual sectors (NACE F – Construction sector). According to the CEA, these are official CDW data for Croatia, which were also delivered to Eurostat. The CEA representatives provided only the data for 2011 and 2012. The reference made in Section 5.1 regarding the data found by desktop research can be also applied to the data on CDW treatment. While comparing CDW generation and treatment data found through the EPR database, it was noted that CDW treatment quantity is almost double the quantity of CDW reported by waste generators.

### 5.3 CDW exports/imports data

According to the desktop research and the stakeholder interviews, information on CDW export/import is included in the regular CDW generation reporting conducted by Agency for Environment.

### 5.4 CDW treatment facilities data<sup>12</sup>

CDW recovery/disposal facilities comprise regional and county waste management centers and landfills of non-hazardous and inert waste. The following are two examples of recycling yards:

- In the City of Zagreb, The Čistoća Branch of Zagrebački Holding Ltd. has been collecting CDW from citizens in three recycling centers (Recycling Yard Stenjevec, Recycling Yard Jakuševac and Green Island Sesvete) since 2009. The largest quantity of CDW that citizens can dispose of is one full single-axle car trailer. Individual pieces of CDW must not be larger than 40 cm. CDW must not contain asbestos, plastics, wood, metal, plasterboard, cables and other non-construction materials.
- In Koprivnica, Komunalac Ltd., a local municipal utility company, built a CDW recycling yard in which CDW is converted into usable raw material by crushing, lowering the need for natural resources, while simultaneously reducing the amount of landfilled waste, which contributes to a longer life of the existing landfill. In 2011, 536.90 m<sup>3</sup> of CDW were collected. The only facility intended exclusively for CDW recycling is located within the landfill Prudinec-Jakuševac (Zagreb), which began to operate in June 2006. The facility has a CDW recycling capacity of 80,000 t/yr. In 2011 13,029.71 t of CDW were recycled.

According to the desktop research and the stakeholder interviews, no information about the number of specific facilities for the recovery/disposal of CDW is available.

### 5.5 Future projections of CDW generation and treatment

We were not able to obtain specific information about future projections of CDW generation and treatment. According to the interviewed CEA representatives, some projections will be made as part of the project 'Improving the flow and quality of data on construction waste and waste from the exploration and exploitation of mineral resources in the Republic of Croatia', scheduled to be launched in 2015. The same applies to changes in the methodology for CDW statistics. Further details about the project are presented in Section 6.1. 'CDW management initiatives'.

### 5.6 Methodology for CDW statistics

The Croatian Environmental Agency is responsible for gathering data on CDW generation and treatment on a yearly basis. For this purpose, the already mentioned EPR database<sup>13</sup> has been established. The EPR database collects the data on sources, type, quantity, method and place of discharge, transfer and disposal of contaminated materials and waste into the environment. According to the Regulation on the Register of Environmental Pollution, data submission for the EPR database is the responsibility of: waste producers/owners producing at or transporting from their sites more than 50 kg of hazardous waste and/or more than 2000 kg of non-hazardous waste a year, of waste collectors/carriers and waste disposers.

Companies post their data through the Internet using the user name and password provided by the CEA. The reporting deadline is 1 March of the current year for the previous calendar year. In the period from 1 March until 15 June, 20 county offices and the office of the City of Zagreb, in cooperation with the competent inspection, assess the completeness, consistency and credibility of the collected data. The CEA coordinates activities relating to data quality assurance and control.

Waste producers/holders producing annually more than 50 kg of hazardous waste and/or more than 2000 kg of non-hazardous waste have to report the annual data using the registration form PL-PPO (Registration form for producer/holder of produced waste). The reporting forms for waste producers/holders require the

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<sup>12</sup> Croatian Environmental Agency (2013), Elaborate on special waste categories.

<sup>13</sup> Ministry of Environmental Protection, Spatial Planning and Construction (2008), Rules on the Register of Environmental Pollution

presentation of the entire chain of movement of waste, from the place of generation to the place of final recovery/disposal (in case that waste is forwarded for a final recovery/disposal to another country, the relevant location has to be specified).

Waste treatment facilities (including landfills) report data using the PL-OPKO form (Registration form for recovery/disposal operator of industrial and/or municipal waste). It contains general data about the operator and, for each waste type, data about the quantities of waste accepted in the reporting year (from the territory of Croatia and imported from another countries separately), data about temporary storage, waste handling (waste quantities from the aspect of disposal and recovery procedures).<sup>14</sup>

The methodology used for gathering the official data on CDW generation and treatment is in line with the Eurostat guidelines. The same data are presented to Eurostat. Based on our understanding, EPR database does not provide sufficiently reliable data on CDW generation and treatment because many construction entities underreport their CDW quantities. Therefore, the CDW generation data correspond to the sum of the data declared by the waste producers/holders and not to a national estimation based on the reported data

According to the interviewed stakeholders, there are notable differences between reported quantities and actually incurred quantities due to poor reporting habits of waste producers/holders.

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<sup>14</sup> Internal information provided by CEA.

## 6 CDW management in practice

In this section the CDW management ‘in the field’ in Croatia is explored. Specific CDW obligations, initiatives, voluntary agreements and any other management practices are mentioned if currently available in Croatia.

### 6.1 CDW management initiatives

Initiatives listed below were identified based on a review of the relevant literature and stakeholder interviews.

Description of initiative	Scope	Year established	National, regional, local (specify which local area/region)	Public sector and/or Industry lead organisation	Levels of performance e.g. tonnes recycled (results)	Further information / web-site
<p><b>CONWAS project – Development of Sustainable Construction and Demolition Waste Management System for Croatia.</b></p> <p>The project was proposed with aims to provide relevant authorities (primary the former MEPPP - Ministry of environmental protection physical planning and construction) a thorough overview of the present state, data necessary for making informed decisions on the best possible construction and demolition waste management system for Croatia. It included proposals of most suitable and economically feasible</p>	<p>The construction sector in Croatia produces 2 million tonnes of construction and demolition waste (CDW). Due to a lack of adequate recycling facilities and a structured and economically sustainable waste management system, only small volumes of waste are properly disposed of, while the recycling and re-use percentage is below 5 %. Despite such waste having a high environmental impact, penalties and incentives are insufficient to change polluters’ behaviour.</p>	2008	National.	<p>Both.</p> <p>The project partners were The Faculty of Civil Engineering of the University of Zagreb, as the leading partner, The Civil Engineering Institute of Croatia and Eko - Flor Plus, a waste management company. External project assistance consultant was ERACON Projekt Ltd.</p>	<p>The CONWAS project resulted in a thorough overview of the present state of CDW to enable informed decision-making during the legislation process and to establish a firm foundation for a sustainable waste management in Croatia.</p> <p>Another key project outcome was the identification of optimal waste management technologies and the establishment of the most effective continuous waste chains from the place of production to the end users of reusable materials and final disposal of non-reusable residues.</p> <p>The project contributed to the checking of all registered landfills and many wild, unregistered ones. This included designing and sending questionnaires to about 300 affected communes and visits to more than 1270 locations by the project team. Several pilot activities were</p>	<p>PDF file – CONWAS Project – Layman report</p>

Description of initiative	Scope	Year established	National, regional, local (specify which local area/region)	Public sector and/or Industry lead organisation	Levels of performance e.g. tonnes recycled (results)	Further information / web-site
<p>models for collection and recycling plants as well as organisation of the system. It helped the relevant authorities to prepare new legislation and develop the Waste Management Plan.</p>					<p>initiated, separating CDW into different compounds. In addition, the project created a waste database that contains checked and updated figures from the field. A new waste management plan, the Croatian National Waste Management Plan (NWMP), was adopted by the Environment Ministry in June 2007. It includes the data collected by the LIFE project. Standard calculations were developed to support optimisation of waste management on the building/deconstruction site and in recycling plants. The beneficiary agreed with the Environment Ministry further steps for the collaboration on CDW management and established continuous communication with the Environment Agency. Finally, the project developed and implemented education and awareness-raising tools that will support the enforcement of the overall environmental policy and legislation.</p>	
<p><b>Twinning Project – Strengthening the capacities for control of transboundary movement of waste.</b> The purpose of this project is to build capacity for enforcing the provisions of national and international regulations regarding</p>	<p>The main activities of Component 1 which focuses on the development of procedures for coordinated enforcement of the regulation related to transboundary movement of waste and supporting materials are the development of the following: - Procedures for coordinated enforcement of the regulations</p>	2012	National.	Public sector - A project implemented by the Ministry of Environmental and Nature Protection of the Republic of Croatia and Umweltbundesamt (Environmental Agency Austria) funded by the European Union.	<ul style="list-style-type: none"> <li>- Comprehensive review of organizational structure, functioning among the relevant stakeholders and cooperation models related to transboundary movement of waste in selected Member States conducted</li> <li>- Assessment of current situation regarding the enforcement of Waste Act and related regulations concerning transboundary movement of waste</li> </ul>	<p><a href="http://www.projektfts.hr/ms/transport_waste/welcome_en/">http://www.projektfts.hr/ms/transport_waste/welcome_en/</a></p>

Description of initiative	Scope	Year established	National, regional, local (specify which local area/region)	Public sector and/or Industry lead organisation	Levels of performance e.g. tonnes recycled (results)	Further information / web-site
<p>transboundary movement of waste and improve performance of the Ministry of Environmental and Nature Protection as well as of other relevant project stakeholders.</p>	<p>related to transboundary movement of waste between inspectors and other relevant stakeholders' staff</p> <ul style="list-style-type: none"> <li>- a Manual for coordinated enforcement of Regulation 1013/2006 and related provisions in the Waste Act and related bylaws</li> <li>- a Waste Catalogue and an information toolkit.</li> </ul> <p>The main activities of Component 2 which focuses on capacity building of environmental protection inspectors and other stakeholders for coordinated enforcement of the regulations related to transboundary movement of waste are as follows:</p> <ul style="list-style-type: none"> <li>- Design and implementation of a training programme for all environmental protection inspectors and key stakeholders to enhance enforcement of the regulations related to transboundary movement of waste.</li> <li>- Production of a movie/DVD on inspections of transboundary movement of waste on border crossings.</li> </ul> <p>Component 3 focuses on improving collaboration with stakeholders and INTERPOL and EUROPOL and comprises the following activities:</p> <ul style="list-style-type: none"> <li>- Organization of meetings of the Working Group for collaboration</li> </ul>				<p>against correlating models of selected Member States prepared.</p> <ul style="list-style-type: none"> <li>- Procedures for coordinated enforcement of the regulations related to transboundary movement of waste between inspectors and other relevant stakeholders' staff established.</li> <li>- Manual for coordinated enforcement of Regulation 1013/2006 and related provisions translated into Croatian, published and disseminated.</li> <li>- Waste Catalogue and information toolkit produced.</li> <li>- Training needs analysis (TNA) conducted and training programme designed for all target groups (environmental protection inspection, permit writers, customs, police, coast guard, port authorities, State Office for Radiation and Nuclear Safety) in order to prepare them for an efficient enforcement of the regulations on transboundary movement of waste, combining indoor and on-the-job training.</li> <li>- Training programme carried out as planned.</li> <li>- Movie/DVD on inspections of transboundary movement of waste on border crossings produced.</li> </ul>	

Description of initiative	Scope	Year established	National, regional, local (specify which local area/region)	Public sector and/or Industry lead organisation	Levels of performance e.g. tonnes recycled (results)	Further information / web-site
	with Interpol/Europol - Elaboration of recommendations for improving cooperation with Interpol and Europol in the area of transboundary movement of waste.					
<b>Improving the flow and quality of data on construction waste and waste from the exploration and exploitation of mineral resources in the Republic of Croatia – Croatian Environmental Agency’s draft project</b>	The project envisages, among others, an analysis of the CDW sector, development and application of methods for determining CDW quantities, determining quantities in 2014 and quantity projections until 2030, the calculation of the recycling rate for CDW in accordance with the requirements of the Framework Directive on Waste quality, Score data, a market analysis and an assessment of the potentials for using CDW (especially mineral) as secondary raw material.	2015	National.	Both.	Current state of a project – draft version – preparatory activities related to the implementation of the project.	Internal information.

The following initiatives could be selected as interesting case studies for Task 2:

- CONWAS project – Development of Sustainable Construction and Demolition Waste Management System for Croatia.
- Improving the flow and quality of data on construction waste and waste from the exploration and exploitation of mineral resources in the Republic of Croatia – Croatian Environmental Agency’s draft project.

## 6.2 Stakeholders' engagement

This subsection was presented to all contacted parties during the stakeholder consultation of the screening phase in order to incorporate their views, insights and hands-on experience on CDW management initiatives already in place in Croatia. The table below aims to summarise information on the existing initiatives identified above or those identified by the stakeholders themselves, together with a preliminary assessment of the enabling factors/obstacles, advantages/drawbacks, and other relevant comments.

Description of initiative	Scope, year established, actors involved	Advantages/ Enabling factors - Disadvantages/ Obstacles	Goals to achieve	Further information/ web-site
<p><b>Improving the flow and quality of data on construction waste and waste from the exploration and exploitation of mineral resources in the Republic of Croatia – Croatian Environmental Agency's draft project</b></p>	<p>The project envisages, among others, an analysis of the CDW sector, development and application of methods for determining the amount of CDW, determining quantities in 2014 and quantity projections until 2030, the calculation of the recycling rate for CDW in accordance with the requirements of the Framework Directive on Waste quality Score data, a market analysis and an assessment of the potential for using CDW (especially mineral) as secondary raw material.</p> <p>2015.</p> <p>Croatian Environment Agency.</p>	<p>N/A</p>	<p>High-quality data on the composition and quantities as well as the projections will be the basis for further planning of the necessary infrastructure and CDW management practice in Croatia.</p> <p>The project outcomes will serve as inputs for the assessment of the situation in the sector and the development of waste management plans as well as a basis for specific recommendations and suggestions for improving the current waste management system, including a successful implementation of the new requirements defined in the Act on Sustainable Waste Management and in the Rules, using the targets set in accordance with the obligations of the EU as a reference.</p>	<p>Internal information</p>

### 6.3 Waste legislation enforcement

The Ministry of Environmental and Nature Protection, specifically, its Environmental Inspection units are responsible for monitoring and enforcing the waste regulation requirements in Croatia. The Environmental Inspection supervises, within its jurisdiction, appropriate implementation of the Environmental Protection Act, the Air Protection Act, the Act on Sustainable Waste Management and Law on Protection against light pollution and the related regulations by companies and individuals, regulates overall environmental issues, air protection, waste management and hazardous waste management, and protection from light pollution. Based on these regulations, the inspection supervises the implementation of the measures referred to in acts on environmental impact assessment and integrated environmental protection and undertakes measures to eliminate potentially negative consequences of extraordinary events on the environment, monitors the quality of bathing water at beaches, transboundary movement of waste and hazardous waste, the quality of liquid petroleum fuels, treatment with substances that deplete the ozone layer, and the implementation of ratified international treaties.<sup>15</sup> Information about any sanctions or potential fines charged was not available.

The relevant authority is responsible for enforcing a wide range of environmental protection measures, specifically those concerning CDW. In this view, as well as according to stakeholder interviews, there is a need for further capacity building (financial and human).

Overall, the waste reporting rate is very low, as corroborated by the number of the existing wild/illegal landfills. According to the estimates provided by the interviewed stakeholders, CDW accounts for around 90 % of the illegally dumped waste. Uncontrolled, illegal landfilling makes inspections and sanctions even more difficult to implement.

Based on our understanding, there is no officially available information about court cases, and infringement procedures regarding CDW have never taken place in Croatia.

There are also many cases of illegal dumping of CDW, for example, the illegal landfill Pobrežje near the Dubrovnik City. According to most recent information, the Ministry of Environmental and Nature Protection is initiating an investigation to determine the owner of the landfill. Recently, concrete blocks have been placed at the landfill entrance, and a video surveillance system is going to be installed soon.<sup>16</sup>

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<sup>15</sup> Ministry of Environmental and Nature Protection, Environmental Protection Inspection.

<sup>16</sup> Newspaper 'Dubrovački vjesnik'.

## 6.4 Drivers/barriers to increase CDW recycling

Factor / characteristic / element in CDW recycling chain	Drivers	Barriers
Legislation and regulation	<ul style="list-style-type: none"> <li>• EoW status and criteria defined by law</li> <li>• New CDW Rules to be introduced soon</li> <li>• Legislation changes and activities in the area signify positive political will.</li> </ul>	<ul style="list-style-type: none"> <li>• Clear policies or rules regarding recycling not defined.</li> <li>• Room for improvement in the area of law enforcement where specific penalty provisions need to be introduced for non-compliance.</li> </ul>
Treatment facilities and their territorial network	<ul style="list-style-type: none"> <li>• National strategic programmes and EU funding priorities promote the establishment of treatment facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Need for more (organized) places for CDW collection.</li> <li>• Insufficient selective separation facilities.</li> <li>• High costs of transportation and depositing.</li> </ul>
Monitoring system	<ul style="list-style-type: none"> <li>• Strong engagement of the Croatian Environment Agency in improving the system.</li> <li>• Changes to the data management system announced.</li> </ul>	<ul style="list-style-type: none"> <li>• Great number of wild landfills</li> <li>• Underreported quantities of waste.</li> <li>• Poor reporting culture among owners/producers</li> <li>• Relatively low rate of data collection about treated waste and related facilities.</li> </ul>
Public awareness	N/A	<ul style="list-style-type: none"> <li>• Lack of interest in waste management in general, not only in CDW</li> <li>• Relatively low level of CDW specific information, brochures and education.</li> <li>• Higher engagement of all stakeholders is needed.</li> </ul>
Implementation of strategic guidelines		<ul style="list-style-type: none"> <li>• Actual and continuous implementation of the guidelines for CDW management system improvement laid down in the Waste Management Strategy (2005 – 2025)</li> </ul>
Building companies' practices		
Public procurement		<ul style="list-style-type: none"> <li>• There are no specific initiatives around public procurement to support the use of recycled materials from CDW or environmentally sound materials.</li> </ul>
Market conditions: prices, costs		<ul style="list-style-type: none"> <li>• Market prices and operating costs of CDW sorting, recovery and recycling are still considered too high, according to the stakeholder interviews</li> </ul>

## 7 CDW sector characterisation

In this section some specific characteristics of the CDW management sector in Croatia are explored. Issues covered in this section concern the CDW sector characteristics, including market conditions, enabling factors, import and exports of CDW and the characteristics of recycled CDW products.

### 7.1 Sector characteristics

#### Responsible actors in CDW management – national level

High-level guidelines for CDW management and the efficiency of waste management are defined by the Croatian Government and the Ministry of Environmental and Nature Protection, by adopting the relevant regulations and strategic planning documents.

The Ministry carries out administrative and inspection supervision over the implementation of the regulations.

Implementing bodies are The Croatian Environment Agency and The Environmental Protection and Energy Efficiency Fund. The Agency is collecting data according to the Act on Sustainable Waste Management. It also plays the role of a Waste Information System and provides Waste Statistics.

#### Responsible actors in CDW management – regional level

Counties, including the City of Zagreb, are responsible for waste management at the regional level, with cities and municipalities being responsible locally. Moreover, counties and municipalities are responsible for the establishment of treatment facilities, either those self-managed or surrendered to other legal entities under concession arrangements.

According to the Rules on construction waste management, the counties and the City of Zagreb have the obligation to identify locations for managing construction waste on their respective territories.

#### Responsible actors in CDW management – companies/entities

Special entities/companies are responsible for the treatment, collection, transport and final disposal of waste. Each entity that is dealing with waste treatment must possess a waste treatment license. This obligation applies for waste treatment in general, as well for CDW.

Some of these entities are:

- C.I.A.K Ltd.
- EURCO
- Zagrebačke ceste – Working Unit “CDW Recycling”
- Odlagalište Sirovina etc.

#### CDW treatment facility

The 2007–2015 WMP defines the key characteristics and requirements for CDW treatment facilities, in line with the planned management of the current and newly generated CDW, as elaborated in Section 3.2. above.

In this context, the Plan envisages the following:

- A Recycling yard (RY): a facility intended for sorting and temporary storage of special types of waste. RYs play a significant role in the overall waste management system because they serve as a link used by local self-government units to ensure connecting citizens, licensed waste collectors and licensed waste processors and/or a waste management centre.
- A Transfer station (TS): a facility where waste is temporarily stored, prepared and reloaded for shipment to a waste management centre (WMC). According to the waste management concept in Croatia, a waste flow includes its passing through TS. A waste transfer station is a facility where municipal waste collected through a waste collection network is unloaded from collection vehicles, inspected (possibly including separation of bulk waste), briefly held, reloaded onto larger transport vehicles and transported to a waste management centre for further treatment.

- Waste collected in a transfer station is transported to the WMC located at a certain distance from the inhabited area. Waste treatment operations carried out in the WMC are for example: acceptance, treatment of sorted or unsorted waste; collection of reusable or recyclable waste and collection and further transferring of hazardous waste; collection and distribution of waste that may be used for other purposes; energy recovery of certain waste fractions and deposition of treated waste.<sup>17</sup>

## 7.2 Exports / imports of CDW

In Zagreb, the landfill Prudinec located in Jakuševac has a CDW recycling facility. Based on the oral information received, CDW recycling capacities at the national level are not sufficient. The CDW recycling rate is low and there is no obligation or intention to export CDW specifically for recycling purposes. The only exported CDW is hazardous CDW containing asbestos and PCB – 17 06 05\*, 17 06 01\*, 17 09 02\*.

According to the desktop research and interviews, information on CDW export/import is included in the regular CDW generation reporting conducted by Agency for Environment.

## 7.3 CDW as landfill cover

### 7.4 According to the desktop research and interviews, no information on this subject is available in official statistics. Market conditions/costs and benefits

According to the desktop research and interviews, there are no financial incentives for recycling CDW (e.g. landfill tax, etc.), and there are no penalties either.

## 7.5 Recycled materials from CDW

Active recycling activities are not yet developed. As a result, there are no CDW products or their consumption. End-of-Waste criteria for aggregates are not established. So far, the criteria have been adopted for iron, aluminium, copper and glass. However, according to the provided information, the EoW-status compliant quantities of waste are still not included in the CDW generation reporting (statistics).

## 7.6 Construction sector make up<sup>18</sup>

The construction sector in Croatia follows the general economic trends and is now undergoing the sixth consecutive year of recession. All main sectorial indicators point to this, as well as the decrease in the volume of construction projects and a drop in the employment level. In June 2014 the total number of employees in this sector was lower by 5.8 percent year-on-year. In the period from January to July 2014 the volume of the construction works decreased by 42.5 percent compared to the same period of 2008. The extent of the recession in the construction industry is perhaps best illustrated by the fact that, in the period from December 2008 to July 2014, the number of employees decreased by as many as 50,090 (55.8 percent).

Nevertheless, the sector still holds an important place in the Croatian economy and, according to the latest available data from the Central Bureau of Statistics, its share in the country's overall economy in the first half of 2014 was about 4.4 percent.

According to data for the period 2008–2012, the housing construction had the highest relative decline of 62.2 percent. In the same period, non-residential property construction fell 43.4 percent, and transport infrastructure 39.1 percent.

The table below summarizes the value of works done over the three-year period from 2011 to 2013, analysed by types of works:

<sup>17</sup> Croatian Government (2007), Waste Management Plan 2007–2015

<sup>18</sup> Buturac Goran, The Institute of Economics Zagreb (2014), Sector Analyses – Construction and Real Estate

<b>Official data on value of works done, by types of works</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Total</b>
New constructions	10 449 922	9 466 870	8 307 302	<b>28 224 094</b>
Reconstructions, adaptations and major repairs	3 940 491	4 109 278	4 568 649	<b>12 618 418</b>
Maintenance and minor repairs	2 393 262	2 400 067	2 215 274	<b>7 008 603</b>
<b>Total</b>	<b>16 783 675</b>	<b>15 976 215</b>	<b>15 091 225</b>	<b>47 851 115</b>

Source: Statistical Reports – Construction 2013, Croatian Bureau of Statistics

The table below summarizes the value of construction works done over the three-year period from 2011 to 2013, analysed by types of construction:

<b>Official data on Value of construction works done, by types of constructions</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Total</b>
<b>1 Buildings</b>	<b>8 251 759</b>	<b>7 168 805</b>	<b>6 262 501</b>	<b>21 683 065</b>
1.1 Residential buildings	2 723 177	2 162 466	1 907 970	<b>6 793 613</b>
1.2 Non-residential buildings	5 528 582	5 006 339	4 354 531	<b>9 888 458</b>
<b>2 Civil engineering works</b>	<b>8 373 078</b>	<b>8 688 541</b>	<b>8 682 831</b>	<b>25 744 450</b>
2.1 Transport infrastructure	5 777 826	5 942 192	6 050 335	<b>17 770 353</b>
2.2 Pipelines, communication and electricity lines	2 166 720	2 317 763	2 210 776	<b>6 695 259</b>
2.3 Complex constructions on industrial sites	428 532	428 586	421 720	<b>1 278 838</b>
<b>Total</b>	<b>16 624 837</b>	<b>15 857 346</b>	<b>14 945 332</b>	<b>47 427 515</b>

Source: Annual Report on Construction Works in the Republic of Croatia, Legal Entities Employing 5 or More Persons 2013, 2012, 2011, Croatian Bureau of Statistics

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- Interview with Vibor Bulat, CDW expert, Croatian Environmental Agency, 13 April 2015
- Interview with Hrvoje Buljan, Director of Environmental Permit and Risk Facilities Office, Ministry of Environmental and Nature Protection, 22 April 2015
- Interview with Darko Horvat, Director of Sector of Special Waste Categories - Department of Sustainable Development, Ministry of Environmental and Nature Protection, 22 April 2015
- Interview with other representatives of Ministry of Environmental and Nature Protection and Environmental protection and energy efficiency Fund

## *Other consulted stakeholders*

The following stakeholders have been contacted but didn't participate:

- Zagreb City Office for Physical Planning, Construction of the City, Utility Services and Transport, Mr. Dinko Bilic, Head of City Office
- Croatian Bureau of Statistics
- Croatian Chamber of Civil Engineers, Mr. Zvonimir Sever, President
- Zagreb Waste Management Company, Mrs. Anita Udovicic, Director
- C.I.A.K Ltd., Mr. Vedran Supukovic, Director

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