

## Report on Solid Waste Management in Croatia for 2018.

### Annex 1 - Questionnaire on Institutional and Legal Framework on MSWM

#### Recent achievements

National goals are not realized as planned because of few main reasons:

1. Large number of small local municipal utility companies are not financially capable and they do not have enough workpeople to reach the goals.
2. National tenders for financing waste collection equipment from EU funds are not aligned with the priorities in the system - vehicles, containers and construction of recycling yards were first funded and waste sorters and composters were left last. That is problematic because of the significant costs for management of not sorted recyclable waste because companies that buy waste as raw material don't want to buy unsorted waste.
3. Demanding legislation for the construction of recycling yards

Government has recognized the needs to reduce bio waste on landfills and to use it in plants for producing biogas. With new legislation, government strengthened regional and local governments to take responsibility for the goals of municipal waste management.

#### 1. Institutional aspect

Please provide the following information:

##### 1.1. Which institutions are responsible for the following waste management aspects?

WM aspect	Status 2015	Status 2018
a) Development and implementation of the national waste management policy		<ul style="list-style-type: none"> <li>- Ministry of Environment and Energy ("Ministarstvo zaštite okoliša i energetike")</li> <li>- Local governments – municipalities</li> <li>- Municipal waste collection companies</li> </ul>
b) Drafting and enforcement of the legislation, strategies and policies		<ul style="list-style-type: none"> <li>- EU policies</li> <li>- Civil sector</li> </ul>
c) Inspection and control (at national, regional and local level)		<ul style="list-style-type: none"> <li>- Environmental inspection (national and regional level) as a part of Ministry</li> </ul>
d) Data collection on MSW indicators		<ul style="list-style-type: none"> <li>- Croatian Environmental and Nature Agency ("HAOP – Hrvatska agencija za okoliš i prirodu")</li> <li>- Ministry of Environment and Energy ("Ministarstvo zaštite okoliša i energetike")</li> </ul>

e) MSWM information system		<ul style="list-style-type: none"> <li>- Croatian Environmental and Nature Agency (“HAOP – Hrvatska agencija za okoliš i prirodu”)</li> <li>- Ministry of Environment and Energy (“Ministarstvo zaštite okoliša i energetike”)</li> </ul>
f) Waste statistics		<ul style="list-style-type: none"> <li>- Croatian Environmental and Nature Agency (“HAOP – Hrvatska agencija za okoliš i prirodu”)</li> <li>- Ministry of Environment and Energy (“Ministarstvo zaštite okoliša i energetike”)</li> </ul>
g) Monitoring and Reporting at the national level		<ul style="list-style-type: none"> <li>- Croatian Environmental and Nature Agency (“HAOP – Hrvatska agencija za okoliš i prirodu”)</li> <li>- Ministry of Environment and Energy (“Ministarstvo zaštite okoliša i energetike”)</li> </ul>
h) Monitoring and Reporting to the EEA		Ministry of Environment and Energy (“Ministarstvo zaštite okoliša i energetike”)
i) Introducing circular economy principles* into national policies and strategies	n/a	-

## 1.2. Which administrative level has responsibility for Municipal Solid Waste Management?

Administrative level	Status 2015	Status 2018
a) Local administration		Collection, transport, treatment
b) Regional administration		Planning, inspections
c) National administration		Strategic, planning, legal, inspections

## 2. Legal aspect

### 2.1. Which Laws and bylaws regulate the following waste management aspects?

Waste management aspect	Status 2015	Status 2018
a) Data collection on MSW indicators		<p>Law on Sustainable Waste Management (“Zakon o održivom gospodarenju otpadom”), Narodne novine NN 94/13, 73/17, 14/19</p> <p>Environmental Law (“Zakon o zaštiti okoliša”), Narodne Novine NN 80/13, 153/13, 78/15, 12/18, 118/18</p>



b) Waste statistics		Law on Sustainable Waste Management ("Zakon o održivom gospodarenju otpadom"), Narodne novine NN 94/13, 73/17, 14/19  Environmental Law ("Zakon o zaštiti okoliša"), Narodne Novine NN 80/13, 153/13, 78/15, 12/18, 118/18
c) MSWM information system		Law on Sustainable Waste Management ("Zakon o održivom gospodarenju otpadom"), Narodne novine NN 94/13, 73/17, 14/19
d) Monitoring and Reporting at the national level		Law on Sustainable Waste Management ("Zakon o održivom gospodarenju otpadom"), Narodne novine NN 94/13, 73/17, 14/19
e) Reporting to the EEA		Law on Sustainable Waste Management ("Zakon o održivom gospodarenju otpadom"), Narodne novine NN 94/13, 73/17, 14/19
f) Circular economy	n/a	-

## Annex 2 - SWM Local Level Indicators (rural municipality)

### Indicator no.1: Population number

Population: **13.246 inhabitants**

### Indicator no.2: Urban/rural ratio

Urban/rural ratio: **0%** (whole territory of municipality can be classified as rural - density below 150 inhabitants per square and low level of urbanization)

### Indicator no.3: Population at urban area

Population at urban area: **0 inhabitants**

### Indicator no.4: Population at rural area

Population at the rural area: **13.246 inhabitants**

### Indicator no.5: MSW generation per capita

MSW generation per capita (households): **0,29 kg/day**

MSW generation per capita (commercial): - **no data**

### Indicator no.6: Waste composition

National data about waste composition in Croatia (*no other data available*):

- Garden waste: **5,68%**
- Other biodegradable waste: **30,93%**
- Paper and cardboard: **23,19%**
- Glass: **3,65%**
- Cardboard with wax: -
- Cardboard with aluminum: -
- Metal - packaging and other + aluminum cans: **2,07%**
- Plastic packaging waste + plastic bags + hard plastic: **22,87%**
- Textile and leather: **3,71%**
- Diapers: **3,97%**
- Fine elements (<20mm): -



**Indicator no.7: Population covered by MSW collection service (%)**

Population covered by MSW collection service: **90%**

**Indicator no.8: Population covered by MSW collection service in urban area**

Population covered by MSW collection service: **0%**

**Indicator no.9: Population covered by MSW collection service in rural area (%)**

Population covered by MSW collection service in rural area: **100%**

Coverage: **90%**

**Indicator no.10: Population covered by packaging waste collection service (%)**

Population covered by MSW collection service: **65%**

**Indicator no.11: Recycling rate**

- Paper: **57,85%**
- Metal: **53,77%**
- Plastic: **19,93%**
- Glass: **0%**

Average: **32,89 %**

*Recycling rate was calculated in comparison with the average waste composition in Croatia because there is no data about local waste composition.*

**Indicator no.12: Waste Management Fee**

Waste Management fee EUR/ month: **From 3,40 EUR to 13,60 EUR (fixed part) + 0,01 EUR per liter of mixed communal waste.**

**12.1. What kind of costs of the Solid Waste Management services are calculated within the monthly WM fee?**

- costs for collection of SW;
- costs for sweeping of streets;
- costs for recycling;
- costs for composting;
- costs for transport of SW;
- costs of the transfer stations
- costs for disposing of SW;
- other \_\_\_\_\_ (please specify)



### 12.2. What is the method/base for pricing of the provided waste management services?

The waste management services are determined on the basis of:

- a. **Pay-as-you-Throw system - weight or volume of collected solid waste in [kg] or [m<sup>3</sup> or L];**
- b. **Flat fee for each household (hhld) regardless of the amount of the waste generated and regardless of the number of household's members;**
- c. Flat rate per capita (household member);
- d. Residential area in [m<sup>2</sup>];
- e. **combination of methods, \_\_\_\_\_ (please specify)**

Pricing of waste management services is calculated by combining fixed and variable part. The fixed part is determined by the size of the container for mixed communal waste (every household can decide on 80, 120, 240, etc. liter container and every container has a fixed monthly price) and the variable part is determined as “pay-as-you-throw” system.

### 12.3. How the costs for the waste management services are billed to the residents?

- a. **Separate bill only for charging of the solid waste services' costs;**
- b. Bill for all municipal communal services (waste, water, sewer service charges, etc.) including separate line item for solid waste services;
- c. Waste management costs are charged in the frame of the property tax bill;
- d. Combined approach - part of the waste management services are charged through property tax bill, the rest through separate bill for solid waste or communal services;
- e. Waste management costs are charged as a part of the electricity bill;
- f. Other \_\_\_\_\_ (please specify).

### 12.4. Is there a uniform fee for the whole service area of the municipality (urban part – the town and surrounding settlements and rural areas)?

Yes       **No**

12.4.1. If NO, is there different fee for urban and rural areas?

Yes       **No**

12.4.2. If NO, is there a different fee for single family residences (houses) and multi-family residences (buildings)

Yes       **No**

12.4.3. If NO, is there a difference of the fee between the commercial entities, restaurants/enterprises and fee for the households?

**Yes**       No

### 12.5. Which entity is responsible for collection of the waste management fees?

- a. Municipal administration
- b. **Public Utility Company**
- c. Specialized city agency/bureau for collection of fees
- d. Outsourced services by third party for collection of fees



e. Other \_\_\_\_\_ (please specify)

**12.6. What is the monthly fee (in EUR) for the waste management services in the municipality in accordance to the method in force (kg, m3, flat rate, m2, etc.) prescribed by the municipal ordinances?**

- a. \_\_\_\_\_ EUR/kg (Pay-as-you-Throw system - weight of collected solid waste)
- b. **0,01 EUR/L** (Pay-as-you-Throw system - volume of collected solid waste)
- c. \_\_\_\_\_ EUR/hhld flat fee (Flat fee for each household regardless of the amount of the waste generated and regardless of the number of household's members)
- d. \_\_\_\_\_ EUR/capita flat rate
- e. \_\_\_\_\_ EUR/m<sup>2</sup> (Residential area)
- f. other, \_\_\_\_\_ (please specify)

*Fixed part: 3,40 EUR - 13,60 EUR per month (based on the mixed communal waste container volume).*

*Variable part: volume of the container \* number of monthly collections \* 0,01 EUR per liter of mixed communal waste.*

**Indicator no.13: SWM Informal Sector**

**13.1. Is there an informal sector that operate in the observed municipality?**

Yes

No

**Indicator no.14: Land disposal sites for solid waste**

**14.1 Sanitary regional landfill**

Municipality does not dispose its solid waste at the Regional sanitary landfill (it is not yet built), but it does dispose it solid waste at Kurjakana landfill that meets the conditions for the sanitary disposal.

**14.2 Non-compliant municipal landfill**

-

**14.3 Illegal dumpsites**

-

**14.4 Landfills for inert waste**

-

**Indicator no.15: Linear flow index**

Material flow index: **0,19**



## Annex 2 - SWM Local Level Indicators (urban municipality)

### **Indicator no.1: Population number**

Population: **42.615 inhabitants**

### **Indicator no.2: Urban/rural ratio**

Urban/rural ratio: **8,50%**

### **Indicator no.3: Population at urban area**

Population at urban area: **28.434 inhabitants**

### **Indicator no.4: Population at rural area**

Population at the rural area: **14.181 inhabitants**

### **Indicator no.5: MSW generation per capita**

MSW generation per capita (households): **2,01 kg/day**

MSW generation per capita (commercial): - **no data**

### **Indicator no.6: Waste composition**

National data about waste composition in Croatia (*no other data available*):

- Garden waste: **5,68%**
- Other biodegradable waste: **30,93%**
- Paper and cardboard: **23,19%**
- Glass: **3,65%**
- Cardboard with wax: -
- Cardboard with aluminum: -
- Metal - packaging and other + aluminum cans: **2,07%**
- Plastic packaging waste + plastic bags + hard plastic: **22,87%**
- Textile and leather: **3,71%**
- Diapers: **3,97%**
- Fine elements (<20mm): -





**Indicator no.7: Population covered by MSW collection service (%)**

Population covered by MSW collection service: **100%**

**Indicator no.8: Population covered by MSW collection service in urban area**

Population covered by MSW collection service: **100%**

**Indicator no.9: Population covered by MSW collection service in rural area (%)**

Population covered by MSW collection service in rural area: **100%**

Coverage: **90%**

**Indicator no.10: Population covered by packaging waste collection service (%)**

Population covered by MSW collection service: **100%**

**Indicator no.11: Recycling rate**

- Paper: **34,45%**
- Metal: **32,89%**
- Plastic: **2,81%**
- Glass: **10,16%**

Average: **20,08%**

*Recycling rate was calculated in comparison with the average waste composition in Croatia because there is no data about local waste composition.*

**Indicator no.12: Waste Management Fee**

Waste Management fee EUR/ month: **From 3,40 EUR to 13,60 EUR (fixed part) + 0,01 EUR per liter of mixed communal waste.**

**12.1. What kind of costs of the Solid Waste Management services are calculated within the monthly WM fee?**

- costs for collection of SW;**
- costs for sweeping of streets;
- costs for recycling;**
- costs for composting;**
- costs for transport of SW;**
- costs of the transfer stations
- costs for disposing of SW;**
- other \_\_\_\_\_ (please specify)



**12.2. What is the method/base for pricing of the provided waste management services?**

The waste management services are determined on the basis of:

- f. Pay-as-you-Throw system - weight or volume of collected solid waste in [kg] or [m<sup>3</sup> or L];
- g. **Flat fee for each household (hhld) regardless of the amount of the waste generated and regardless of the number of household's members;**
- h. Flat rate per capita (household member);
- i. Residential area in [m<sup>2</sup>];
- j. combination of methods, \_\_\_\_\_ (please specify)

**12.3. How the costs for the waste management services are billed to the residents?**

- g. **Separate bill only for charging of the solid waste services' costs;**
- h. Bill for all municipal communal services (waste, water, sewer service charges, etc.) including separate line item for solid waste services;
- i. Waste management costs are charged in the frame of the property tax bill;
- j. Combined approach - part of the waste management services are charged through property tax bill, the rest through separate bill for solid waste or communal services;
- k. Waste management costs are charged as a part of the electricity bill;
- l. Other \_\_\_\_\_ (please specify).

**12.4. Is there a uniform fee for the whole service area of the municipality (urban part – the town and surrounding settlements and rural areas)?**

Yes                       **No**

12.4.1. If NO, is there different fee for urban and rural areas?

**Yes**                       No

12.4.2. If NO, is there a different fee for single family residences (houses) and multi-family residences (buildings)

Yes                       **No**

12.4.3. If NO, is there a difference of the fee between the commercial entities, restaurants/enterprises and fee for the households?

**Yes**                       No

**12.5. Which entity is responsible for collection of the waste management fees?**

- f. Municipal administration
- g. **Public Utility Company**
- h. Specialized city agency/bureau for collection of fees
- i. Outsourced services by third party for collection of fees
- j. Other \_\_\_\_\_ (please specify)



**12.6. What is the monthly fee (in EUR) for the waste management services in the municipality in accordance to the method in force (kg, m3, flat rate, m2, etc.) prescribed by the municipal ordinances?**

- g. \_\_\_\_\_ EUR/kg (Pay-as-you-Throw system - weight of collected solid waste)
- h. **0,02 EUR/L** (Pay-as-you-Throw system - volume of collected solid waste)
- i. \_\_\_\_\_ EUR/hhld flat fee (Flat fee for each household regardless of the amount of the waste generated and regardless of the number of household's members)
- j. \_\_\_\_\_ EUR/capita flat rate
- k. \_\_\_\_\_ EUR/m<sup>2</sup> (Residential area)
- l. other, \_\_\_\_\_ (please specify)

*Monthly fee is expressed as 0,02 EUR per liter but the calculation is done as surface area multiplied with coefficient (l/m<sup>2</sup>) to get the monthly volume calculation.*

**Indicator no.13: SWM Informal Sector**

**13.2. Is there an informal sector that operate in the observed municipality?**

Yes

No

**Indicator no.14: Land disposal sites for solid waste**

**14.1 Sanitary regional landfill**

Does the municipality dispose its solid waste at the Sanitary landfill?

Yes

No

**14.2 Non-compliant municipal landfill**

Grabovica – in the process of sanation.

**14.3 Illegal dumpsites**

-

**14.4 Landfills for inert waste**

-

**Indicator no.15: Linear flow index**

Material flow index: **0,0968**



## Annex 3 - SWM National Level Indicators

### Indicator no.1: Population number

Population: **4.284.889 inhabitants**

### Indicator no.2: Country income level

- GDP per capita (current US\$): **14,869.1**
- GDP per capita (current LCU): **93,363**
  
- GNI per capita (Atlas method, current US\$): **13,830**
- GNI per capita (current LCU): **91,121**

### Indicator no.3: MSW generation per capita

MSW generation per capita (households) 2017. (official data): **1,139 kg/day**

MSW generation per capita (households) 2018. (calculated of preliminary data): **0,829 kg/day**

MSW generation per capita (commercial): - **no data**

### Indicator no 4. Waste treatment

Waste treatment (%) - Official National statistics for 2017:

- **72,4% landfilled:** 1.242.703,28 tons / year
- **21,3% recycled:** 365.601,93 tons / year
- **2,2% composted / aerobic digestion:** 37.761,70 tons / year
- **0,05% incinerated:** 858,22 tons / year
- **4% on temporary storage or other treatment procedure:** 68.657,64 tons / year

### Indicator no.5: Recycling rate

Recycling rate (Official National statistics for 2017): recycled: 365.601,93 tons / year: **21,3%**.

### Indicator no.6: Land disposal sites for solid waste

**6.1 Sanitary regional landfill:**

Number: **2**



1. Name of the landfill: **Kaštijun**; GPS: latitude **44.840720** and longitude **13.884719**
2. Name of the landfill: **Mariščina**; GPS: latitude **45.413633** and longitude **14.386314**

No. of municipalities using landfill: **77**

### **6.2 Non-compliant municipal landfill**

Number: **98**

- **27 landfills that need to be closed by the end of 2018.**
- **50 landfills that have the permit for waste disposal until the maximum capacity is reached**
- **21 landfills that have the permit for waste disposal until the regional sanitary landfill is open**

No. of municipalities using landfill: **479**

### **6.3 Illegal dumpsite**

-

### **6.4 Landfills for inert waste**

-

### **Indicator no.7: Population covered by MSW collection service (%)**

Population covered by MSW collection service: **99%**.

### **Indicator no.8: Population covered by compliant landfills\* (%)**

Population covered by compliant landfills: **97,3%**.

### **Indicator no.9: Material footprint**

Material footprint: **11,01 tons per capita**

### **Indicator no.10: Circularity index**

- a) GDP per capita: **11.500 €**
- b) Recycling rate: **21,3%**
- c) Energy productivity: **5.4 €/KGOE**
- d) Total number of inhabitants: **4.284.889**
- e) CO2 emissions: **17.000.000 t CO2 / year**

**Circularity index:  $[(a*b)/(c*d*e)] = ???$**



## Annex 4 - Circular economy questionnaire

1. Sector or **sectors** in which the circular economy was mainstreamed first?  
(please rank from 1-6; 1 being the first sector)

Sector	Rank
Packaging	4
Food and agriculture	1
Special waste streams	3
Electric and electronics	2
Shared economy	5
Other sectors:	

2. Which are the **key drivers** towards circular economy approach in your country?  
(please rank from 1-6; 1 being the first key driver)

Key drivers	Rank
Sustainability and environmental protection	4
Reducing waste, recycling and avoiding landfill	3
New business models/profit	5
Job creation	6
EU standards	1
Regulation	2
Other drivers:	

3. Which **stakeholder group** in your country are the **main driver** of change towards the circular economy?  
(please rate importance of each of the stakeholder from 1-5; 1 – being the greatest important)

Stakeholder group	Rate				
	1	2	3	4	5
Central government		x			
Regional government	x				
Local government	x				
Public Utility Companies	x				
Private sector - large companies		x			
Private sector - Small and Medium Enterprises	x				
Civic sector				x	
Academia/research and development		x			
Citizens		x			
Other driver:					

4. What are the main **barriers/hurdles** towards faster switch in circular economy?  
(please rank from 1-6; 1 being insignificant and 6 being the significant barrier)

Barriers/hurdles	Rank
Legal	2
Economic	5



Financial	4
Administrative	1
Awareness	3
Other	

5. What is the level of **awareness** about EU Circular Economy policies among different stakeholder groups?  
*(please rate level of awareness of each of the stakeholder group from 1-5; 1 – being the highest awareness)*

Stakeholder group	Rate				
	1	2	3	4	5
Decision makers at central level	x				
Decision makers at regional level				x	
Decision makers at local level				x	
Public Utility Companies					x
General population			x		
Big private companies			x		
Small and Medium Enterprises		x			
Civic Society	x				

6. How well known are the basic principles of Circular Economy among different stakeholder groups?  
*(please rate level of knowledge on CE of the different stakeholder groups from 1-5; 1 – being the best knowledge)*

**Principles of Circular Economy:**

Principle 1 - to preserve and enhance natural capital

Principle 2 - to optimize resource yields

Principle 3 - to foster system effectiveness

Stakeholder group	Rate				
	1	2	3	4	5
Decision makers at central level	x				
Decision makers at regional level				x	
Decision makers at local level			x		
Public Utility Companies			x		
General population				x	
Big companies		x			
Small and Medium Enterprises			x		
Civic Society	x				

7. Are there existing financial mechanisms that are supporting transition towards circular economy?

Yes, from EU funds.

8. What is being done on promotion of Circular Economy in your country?

The promotion is mostly done on conferences about sustainable waste management and environment protection by the government representatives.

9. Can you name an example of applied circular economy principles in your country?

The use of bio waste in biogas plants.