EUROPEAN COMMISSION
EUROSTAT

Directorate E: Sectoral and regional statistics
Unit E-2: Environmental Statistics and Accounts; Sustainable Development

30 June 2020

Template for the Quality Report on Waste Statistics for the reference year 2018

1 Heading (QR_WASTE_HR_2018_1)

Part I: Description of the data

2 Identification

Country name **Croatia**

Reference year **2018**

Description of data set(s) delivered

Data set 1: Waste generation by waste category (EWC-STAT) and economic activities (NACE), tonnes/year

Data set 2: Waste treatment by waste category (EWC-STAT) and treatment category, tonnes/year

Data set 3: Number and capacity of recovery and disposal facilities (per NUTS 2 region) and population served by collection scheme (national)

Transmission date **30 June 2020**

3 Contact information on the person(s) responsible for the quality of waste statistics

Antonija Šemanjski, mag. ing. oecoing., telephone: +385 1 5581 667, antonija.semanjski@mzoe.hr, Ministry of Environment and Energy, Institute for Environment and Nature

Marcela Kušević-Vukšić, B.Sc., telephone: +385 1 4628 883, marcela.kusevicvuksic@mzoe.hr, Ministry of Environment and Energy, Institute for Environment and Nature

Đurđica Požgaj, univ. spec. oecoing., telephone: +385 1 4628 877, durdica.pozgaj@mzoe.hr, Ministry of Environment and Energy, Institute for Environment and Nature

4 Description of the parties involved/sources used in the data collection

Table 1: Institutions involved and distribution of tasks

Name of institution	Description of key responsibilities
Ministry of Environment and Energy (MEE) / Institute for Environment and Nature	Collects, checks, processes and delivers (submits) data according to Waste Statistics Regulation. Maintains the Waste Management Information System: Environmental Pollution Register (EPR), Waste Management Permits Register (WMPR), Central Management System for the Data on Landfills of Waste, Database on transboundary movement of waste, etc. Up to 1st of January 2019, the Institute operated as Croatian Agency for Environment and Nature (CAEN).
Ministry of Environment and Energy (MEE) / Directorate for Environmental Impact Assessment and Sustainable Waste Management	Permits for hazardous waste management, permits for thermal treatment of non-hazardous waste, registers for carrying out waste management operations (Register of Waste Carriers, Register of Waste Management Brokers, Register of Waste Dealers, Register of Recycling Yards and Register of Persons Dealing with Energy Recovery from Waste).

The 20 county offices and office of the City of Zagreb	Quality check of reported data to EPR in terms of their completeness, consistency and credibility. Responsible for issuing the permits which are not covered by MEE/Directorate.
Environmental Protection and Energy Efficiency Fund (EPEEF)	Collects detail data on special waste categories (packaging waste, waste tyres, waste oils, waste batteries and accumulators, end-of-life vehicles, waste electric and electronic equipment, waste containing asbestos, etc.) according to special ordinances.
Ministry of Agriculture	Collects data on animal by-products.

Ministry of Environment and Energy / Institute for Environment and Nature (MEE/Institute) operated as Croatian Agency for Environment and Nature (CAEN) up to 1st of January 2019. Its main activity is the collection and compilation of data and information about the environment and nature, in order to ensure and monitor the implementation of environmental policy and nature, sustainable development and the performance of professional activities related to the protection of the environment and nature. By the Environmental Protection Act (OG No 80/13, 153/13, 78/15, 12/18, 118/18) it is appointed as central information authority of the Republic of Croatia for coordinating reporting and reporting to the European Commission on the implementation of specific environmental protection regulations, including waste. It is responsible for maintaining the Waste Management Information System, enabling and facilitating access to information on waste to decision-makers and general public, developing reports on the status of the waste sector on the national and international level. In 2012, through an agreement with Croatian Bureau of Statistics (CBS), responsibilities for the preparation and submitting of data according to WSR to Eurostat were transferred to the CAEN (MEE/Institute). Data on Waste Statistics for the reference year 2010 and previous years were delivered by the CBS.

By the Act on Sustainable Waste Management (OG No 94/13, 73/17, 14/19, 98/19) and subordinate legislation MEE/Institute is collecting waste data, such as: annual data on produced, collected, treated waste (on-line database); data on waste management permits and certificates (on-line database); data on landfills (on-line database); data on transboundary shipment of waste; data on waste management plans (on-line database) etc.

Maintaining of database The Environmental Pollution Register (EPR) is stipulated by Ordinance on Environmental Pollution Register (OG No 87/15). It contains annual data on waste generators (≥ 0,5 t hazardous and/or ≥ 20 t non-hazardous), all waste collectors and all waste treatment facilities. Electronic software (application) is used for accessing and maintaining the EPR and it enables network data entry, data processing and displaying of data reported in the EPR.

Waste Management Permits Register (WMPR) database contains information and documents on waste management permits (for hazardous, non-hazardous and municipal waste). Registers for carrying out waste management operations contains Register of Waste Carriers, Register of Waste Management Brokers, Register of Waste Dealers, Register of Recycling Yards and Register of Persons Dealing with Energy Recovery from Waste.

According to the Act on Sustainable Waste Management (OG No 94/13, 73/17, 14/19, 98/19) all landfill operators are obliged to report data on landfills twice a year into the Central Management System for the Data on Landfills of Waste. Database contains general data on technical measures on landfills, data on rest capacities, data on environmental protection measures carried out on landfills, data on status of landfill activity and remediation, data on landfilled amounts of biodegradable waste, data on total amounts of waste landfilled etc. Data collected in this database are used for cross-checking data reported to EPR.

Transboundary Waste Shipment Database (TWSD) contains data from decisions for transboundary shipment of waste which is subject to notification procedure and data from yearly reports on quantities and

types of shipped waste by importers and exporters of waste. According to the Act on Sustainable Waste Management (OG No 94/13, 74/17, 14/19, 98/19) importers and exporters of waste are obliged to submit yearly report on quantities and types of shipped waste to the MEE/Institute.

The Environment Protection and Energy Efficiency Fund (EPEEF) is responsible for organizing and monitoring systems for management of special waste categories, as well as remediation of official landfills. According to the ordinances which stipulate the management of special waste categories EPEEF collects detailed data on these waste categories. Data collected by EPEEF are used for cross-checking data reported to EPR.

According to Regulation (EC) No 1069/2009 and Regulation (EC) No 142/2011 Ministry of Agriculture, Directorate for Veterinary and Food Safety maintains registers for carrying out anaerobic digestion and incineration of animal by-products. By entering into force of the new Act on Sustainable Waste Management (OG NO 94/13) in 2013 those facilities are also obliged to obtain permits according to the mentioned Act. Hence, data on animal by-products, including data on processed products which are destined for incineration, landfilling or use in a biogas or composting plant from 2013 onwards should be reported to Waste Management Information System maintained by MEE/Institute.

5 General description of which methods are used in which part of the data set

Data set 1: Waste generation by waste category (EWC-STAT) and economic activities (NACE), tonnes/year

General description of methodology

Table 2: Description of methods for determining waste generation

Waste Item	Source																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1																			
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44																			
45																			

Waste Item	Source																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
46																			
47																			
48																			
49																			
50																			
51																			

	Data reported by waste producers/holders into the database EPR
	Data reported by waste collectors into the database EPR
	Combination of the data reported by waste producers/holders and waste collectors into the database EPR
	Combination of the data reported by waste producers/holders and waste treatment facilities into the database EPR
	Combination of the data reported by waste treatment facilities into the database EPR and data collected by Ministry of Agriculture
	Combination of the data reported by waste producers/holders and waste treatment facilities into the database EPR and data on transboundary movement of waste
	Data reported by waste producers/holders, waste collectors and waste treatment facilities + estimations
	Data reported by waste producers/holders + estimations
	Estimation

Table 3: Description of classifications used

	Name of classification(s) used	Description of the classification(s) (in particular compatibility with WStatR requirements)
Economic activities	NACE Rev. 2.	Directly compatible with WStatR requirements
Waste types	List of Waste (LoW)	Converted into EWC – Stat /Version 4 classification with conversion key (Commission Regulation 574/2004/EC amending Annexes I and III to Regulation 2150/2002/EC)
Recovery and treatment operations	R&D codes	In line with Waste Framework Directive (2008/98/EC) and WStatR

Determination of waste generation by (sample) survey

N/A (Not Applicable).

Determination of waste generation in the economy on the basis of information on waste treatment

- Chemical wastes (code 01.4, 02, 03.1) – in NACE A and NACE sections G – U excl. 46.77 combination of data reported by waste producers/holders and waste treatment facilities were used. The difference in quantities reported by waste treatment facilities and waste producers/holders was taken into consideration. By checking the coverage of the companies which reported data into the EPR it was determinate that there are significant number of small enterprises which do not exceed the annual threshold of 500 kg of hazardous waste, so they are not obliged to report data into the EPR. Therefore the above-mentioned difference was added to those NACE sections G – U excl. 46.77.

- Health care and biological wastes (code 05) – in NACE sections G – U excl. 46.77 the combination of data reported by waste producers/holders and waste treatment facilities were used. The difference in quantities reported by waste treatment facilities and waste producers/holders was taken into consideration. By checking the coverage of the companies which reported data into the EPR it was determinate that there are significant number of small enterprises which produce this type of waste but do not exceed the annual threshold of 500 kg of hazardous waste and hence are not obliged to report data into the EPR. Therefore the above-mentioned difference was added to those NACE sections G – U excl. 46.77.

- Metallic wastes, ferrous (code 06.1) and non-ferrous (06.2) – in NACE section F the combination of data reported by waste producers/holders and estimations were used. Amounts produced by construction and demolition activities which were reported in all economic sections except in section F were allocated to section F.

- Metallic wastes, mixed ferrous and non-ferrous (code 06.3) – in NACE section F, NACE sections G – U excl. 46.77 and NACE class 46.77 the combination of data reported by waste producers/holders, waste collectors and estimations were used. Additionally, amounts produced by construction and demolition activities which were reported in all economic sections except in section F were allocated to section F.

- Glass wastes (code 07.1), Plastic wastes (code 07.4), Wood wastes (07.5) – in NACE section F the combination of data reported by waste producers/holders and estimations were used. Amounts produced by construction and demolition activities which were reported in all economic sections except in section F were allocated to section F.

- Rubber wastes (code 07.3) – in NACE sections G – U excl. 46.77 the combination of data reported by waste producers/holders and waste treatment facilities were used. The difference in quantities reported by waste treatment facilities and waste generators was taken into consideration. It was not possible to distinguish quantity of rubber wastes which originate from class 46.77, households and services sector, so the sections G – U excl. 46.77 include amounts from services sector and also amounts from households and class 46.77. By checking the coverage of the companies which reported data into the EPR it was determinate that there are significant number of small enterprises which do not exceed the annual threshold of 500 kg of hazardous waste, so they are not obliged to report data into the EPR. Therefore the above-mentioned difference was added to those NACE sections G – U excl. 46.77.

- Discarded vehicles (code 08.1) – in NACE sections G – U excl. 46.77 and HH (households) data reported by waste producers/holders and waste treatment facilities. This assumption was made on

the basis of the information on origination of discarded vehicles provided by waste treatment facilities.

- Batteries and accumulators wastes (code 08.41) – in NACE sections G – U excl. 46.77 the combination of the data reported by waste producers/holders and waste treatment facilities into the database EPR and data on transboundary movement of waste were used. The difference in quantities reported by waste treatment facilities and waste generators was taken into consideration. The difference between those sources was added to services sector although part of the amount possible may originate from households. It was not possible to distinguish precise shares from commerce and households.

- Animal and mixed food waste (code 09.1) – in NACE section C10 – C12 data on animal tissues were determinate on the basis of data reported by biogas plants to the Ministry of Agriculture and data reported into the database EPR. In NACE sections G – U excl. 46.77 the combination of the data reported by waste producers/holders and waste treatment facilities into the database EPR and data on transboundary movement of waste were used. The difference in quantities reported by waste treatment facilities and waste generators was taken into consideration.

- Animal faeces, urine and manure (code 09.3) – in NACE section C01 – C03 the combination of data reported by biogas plants to the Ministry of Agriculture and into the database EPR and data reported by composting plants to EPR were used.

- Mixed and undifferentiated materials (code 10.2) – in NACE G – U excl. 46.77 the combination of data reported by waste producers/holders and estimations were used. Amounts produced by construction and demolition activities which were reported in all economic sections except in section F were allocated to section F.

- Mineral waste from construction and demolition (code 12.1), Dredging spoils (code 12.7) – in NACE section F data were based on the estimation. For the purpose of improving the data quality concerning waste from NACE activities Mining and quarrying (B) and Construction (F), MEE/Institute implemented the project "Improvement of data flow and data quality regarding construction waste and waste from the exploration and exploitation of mineral raw materials".

- Other mineral waste (code 12.2, 12.3, 12.5), Solis (code 12.6) – in NACE B and NACE F data were based on data reported by waste producers/holders and estimations. For the purpose of improving the data quality concerning waste from NACE activities Mining and quarrying (B) and Construction (F), MEE/Institute implemented the project "Improvement of data flow and data quality regarding construction waste and waste from the exploration and exploitation of mineral raw materials".

Determination of waste generation in the economy on the basis of information on waste collection

- Metallic wastes, mixed ferrous and non-ferrous (code 06.3) – in NACE sections G – U excl. 46.77 the combination of data reported by waste producers/holders, waste collectors and estimations were used. Additionally, amounts produced by construction and demolition activities which were reported in all economic sections except in section F were allocated to section F.

- Glass wastes (code 07.1), Plastic wastes (code 07.4) – in NACE sections G – U excl. 46.77 the combination of data by waste producers/holders and waste collectors were used. The difference was taken into consideration. The difference between those sources was added to services sector although part of the amount possible may originate from households. It was not possible to distinguish precise shares from commerce and households.

- Discarded equipment (excl. discarded vehicles, batteries/accumulators) (code 08 excl. 08.1, 08.41) – in NACE section HH (households) the combination of data reported by waste producers/holders and waste collectors were used. Regarding data on household waste, from 2017 new EPR reporting forms have been introduced (see Chapter 5, Determination of waste generation in the economy on the basis of administrative sources).

Determination of waste generation in the economy on the basis of administrative sources

Determination of waste generation in the economy was mostly done on the basis of the data reported by waste generators, waste collectors and waste treatment facilities into the EPR database. Reporting of the annual data for 2018 is stipulated by provisions of the Act on Sustainable Waste Management (OG No 94/13, 74/17, 14/19, 98/19) and Ordinance on Environmental Pollution Register (OG No 87/15).

Companies report EPR data via Internet by means of user name and password that are assigned by the MEE/Institute. The deadline for reporting is 31st of March current year for the previous calendar year. From 31st of March until 15th of May, 20 county offices and the office of the City of Zagreb in cooperation with the competent inspection ensure the checking of data in terms of their completeness, consistency and credibility. The MEE/Institute coordinates activities relating to data quality assurance and control.

Waste generators producing more than 500 kg of hazardous waste and/or more than 20 tonnes of non-hazardous per a year are obliged to report annual data on registration form NO (Registration form for producer/holder of produced waste). Reporting forms for waste generators require view of the chain of movement of waste, from the place of generation to the waste collector or place of final recovery/disposal.

Industrial waste collectors report data on registration form SO-2 (Registration form for waste collection). Except general data on waste collector, form SO-2 require for each type of waste data on collected amounts of waste and data on locations to which collected waste is forwarded.

Municipal waste collectors report data on the registration form SO-1 (Registration form for municipal waste collectors) and civic amenity sites and waste dealers on the registration form SO-3 (Registration form for amenity sites/mobile amenity sites and waste dealers). Registration forms require view of the chain of movement of waste, from the place of generation (collection) to another waste collector or place of final recovery/disposal. For each type of waste, municipal waste collector has to report town/municipality from which waste originates, collected amount, amount collected from households, from amenity sites etc., location to which collected waste is forwarded. In case of mixed municipal waste, the number of inhabitants covered by collector's service has to be specified.

Waste treatment facilities (including landfills) report data on registration form OZO (Registration form for waste recovery/disposal). Form OZO contains general data about the operator, data about amounts for each waste type taken in the reporting year (from the territory of Croatia and imported from another countries separately), data about temporary storage, waste handling (amounts of waste regarding disposal and recovery procedures) etc.

As some bio-plants and incineration plants for animal by-products in 2018 still didn't obtain waste management permit according to the Act on Sustainable Waste Management (OG No 94/13, 74/17, 14/19, 98/19), part of amounts of animal by-products not intended for human consumption were determined on the basis of the data collected by Ministry of Agriculture which is responsible for issuing approvals of temporary storage, incineration and co-incineration of animal by-products, and approvals of intermediate plants, biogas plants and composting plants which take over animal by-products.

Determination of waste generation in the economy on the basis of other methods

N/A (Not applicable).

Determination of extractive waste generation (new section)

Table 4: Coverage of waste statistics with regard to extractive waste[1)]

Coverage	Topsoil	Overburden	Waste-rock	Tailings (non-haz.)
Completely covered	x	x	x	
Partially covered				
Generally excluded				x

1) Please mark with an X whether the listed materials are completely covered, partially covered or generally excluded from waste statistics.

Tailings aren't covered because in Croatia there is no ore excavation. It is carried out the exploitation of technical building stone, architecturally building stone, building sand and gravel and hydrocarbons.

Determination of waste generated by households

Determination of discarded vehicles amounts originating from households was based on the data reported by waste treatment companies (see Table 5).

For other waste types generated by households amounts are based on the reports provided by municipal waste collection companies, civic amenity sites and waste dealers.

Household and similar wastes (code 10.1) – mixed municipal waste – data on generated amounts of mixed municipal waste by NACE activities were estimated. According to the information given by municipal waste collectors, about 75% of produced mixed municipal waste (LoW 20 03 01) originates from households while the rest (25%) is produced by economic activities. This 25% of totally produced amount of mixed municipal waste was divided with the number of employees in economic activities which resulted in an average ratio of generation of mixed municipal waste per employee and per year. This average was multiplied with number of employees in each NACE activity.

Estimated amounts of produced mixed municipal waste per economic activities are questionable quality mainly because of unregistered number of employees especially in touristic season in services providing accommodation, food preparation and serving which make a significant share in economy.

Data on municipal waste include amounts of municipal waste generated by tourists.

Table 5: Determination methods for waste generated by households

1	Indirect determination via waste collection	
1.1	Description of reporting unit applied (waste collectors, municipalities)	Waste collectors, civic amenity sites, waste dealers.
1.2	Description of the reporting system (regular survey on waste collectors, utilisation of administrative sources)	Household waste (code 10.1) - annual reports into the EPR + additional estimations for population not covered by organised collection of municipal waste Other waste - annual reports into the EPR
1.3	Waste types covered	Spent solvents (code 01.1); Acid, alkaline or saline wastes (code 01.2); Used oils (code 01.3); Chemical waste (code 01.4; 02; 03.1); Health care and biological wastes (code 05); Metallic wastes; ferrous (code 06.1) and non-ferrous (06.2); Metallic wastes; mixed ferrous and non-ferrous (code 06.3); Glass wastes (code 07.1); Paper and cardboard wastes (code 07.2); Rubber waste (07.3); Plastic wastes (code 07.4); Wood wastes (07.5); Textile wastes (code 07.6); Discarded equipment (excl. discarded vehicles; batteries/accumulators) (code 08 excl. 08.1; 08.41); Batteries and accumulators wastes (code 08.41); Animal and mixed food waste (code 09.1); Vegetal wastes (code 09.2); Household waste (code 10.1); Mixed and undifferentiated materials (code 10.2); Other mineral wastes (code 12.2, 12.3., 12.5)
1.4	Survey characteristics (1.4a – 1.4d) **Not Applicable**	
	a) Total no. of collectors /municipalities (population size)	-
	b) No. of collectors/municipalities selected for survey	-
	c) No. of responses used for the calculation of the totals	-
	d) Factor for weighting	-
1.5	Method applied for the differentiation between the sources household and commercial activities	From 2017 new EPR reporting forms have been introduced (see Chapter 5, Determination of waste generation in the economy on the basis of administrative sources). New reporting forms require more detailed information on waste origin, hence data on produced waste by households are more accurate than previous years.
1.6	Percentages of waste from commercial activities by waste types	-
1.7	Population served by a collection scheme for mixed household and similar waste, in %	99%
2	Indirect determination via waste treatment	
2.1	Specification of waste treatment facilities selected	Facilities for mechanical treatment of discarded vehicles.
2.2	Waste types covered	Discarded vehicles
2.3	Method applied for the differentiation between the sources household and commercial activities	Waste treatment facilities provided to the MEE/Institute the shares of discarded vehicles

		(HAZ) taken from households (70%) and commercial activities (30%). For discarded vehicles NHAZ provided shares weren't comparable with data reported to the EPR hence the difference of quantities reported by waste treatment facilities and waste producers were added to the households.
2.4	Percentages of waste from commercial activities by waste types	Discarded vehicles HAZ - 20% Discarded vehicles NHAZ – 28%

Estimation of non-covered amount of municipal waste:

$$\frac{Amount\ of\ municipal\ waste\ collected\ (reported\ into\ the\ EPR)}{Covered\ population\ (reported\ by\ registration\ forms)} * Number\ of\ non-covered\ population$$

Data sets 2 and 3: Waste treatment

General description of methodology, Data collection on capacity of treatment facilities, Data collection on treated amounts of waste

Data collection on capacity of treatment facilities – Relevant waste treatment facilities are identified through WMPR database, run by MEE/Institute. This database contains information and documents on waste management permits. Competent authority for issuing waste management permits for hazardous waste management, permits for thermal treatment of non-hazardous waste, registers for carrying out waste management operations is Directorate for Environmental Impact Assessment and Sustainable Waste Management within the MEE. For all other types of waste competent authorities are county offices and City of Zagreb office. MEE/Institute upon the issuing a permit receives a copy and on the daily bases data are entered into the WMPR database. Waste management permits provide various data, like data on recovery/disposal operations, annual capacities of treatment facilities, etc. The coverage of treatment facilities by WMPR database is almost 100%. For providing data on number and capacities of treatment facilities several sources were used. Most of the data were extracted from WMPR database. In certain number of cases data on capacities from EPR database were used or were obtained contacting directly waste treatment facilities. Only the data on number and capacities of biogas plants and incinerators for animal by-products were partially collected by Ministry of Agriculture as all of this plants didn't obtain permits according to the Act on Sustainable Waste Management.

Data on rest capacity of landfills were determinate on the base of the data reported by landfill operators into the database Central Management System for the Data on Landfills of Waste.

Data on treated amounts of waste mostly were reported by waste treatment facilities into the EPR database according to the procedure described above in section Determination of waste generation in the economy on the basis of administrative sources. Only part of the data on animal by-products treated in biogas plants and incinerators were collected by Ministry of Agriculture. In Croatia there is only one rendering plant of open type. It is the largest animal by-products processor and the majority of the animal by-products generated in Croatia are treated in this company. One of the results of that treatment process is technical fat. In 2018 there wasn't any incineration of technical fat.

6 Major Changes

Changes compared with previous years

By the agreement from May 2012 between MEE/Institute (ex Croatian Agency for Environment and Nature) and Croatian Bureau of Statistics, MEE/Institute took over the obligation of preparation and submitting data according to WSR to Eurostat. For the reference year 2010 and previous years those data were delivered to Eurostat by the Croatian Bureau of Statistics. Comparison of the data from those two sources is not possible because of different methodologies of data collection and processing. The CBS collected data by biannual statistical surveys while MEE/Institute uses administrative source of data.

Regarding reporting data on waste generation into the EPR database, since 2016 new thresholds are in force (500 kg of hazardous waste and 20 tonnes of non-hazardous waste). Up to 2016 thresholds for reporting data on waste generation were 50 kg of hazardous waste and 2 tonnes of non-hazardous waste. Reported data on produced waste showed that increasing thresholds in mentioned range did not significantly influenced reported amounts but reduced administrative burden in economic sector.

From 2017 new EPR reporting forms have been introduced (see Chapter 5, Determination of waste generation in the economy on the basis of administrative sources). New reporting forms require more detailed data on waste origin, hence data on produced waste by households are more accurate than previous years.

For the purpose of improving the data quality concerning waste from NACE activities Mining and quarrying (B) and Construction (F), during 2016 and 2017, the MEE/Institute implemented the project "Improvement of data flow and data quality regarding construction waste and waste from the exploration and exploitation of mineral raw materials". Within this project estimates of waste quantities produced by mentioned NACE activities were made and those estimations were reported in reports 2016 and 2018 according to WStatR.

Detailed information on changes in amounts of generated waste, amounts of treated waste, over time are presented in the chapter 8 Validation.

Number / capacities of waste treatment facilities – Significant difference between the reported data on the rest capacities for the years 2012 and 2014 was recorded. The reason is that in 2012 landfill operators reported data in tonnes whereupon MEE/Institute converted tonnes into the cubic meters by using general density coefficients, while since 2014 operators has to report by themselves data in cubic meters what is considered to be more reliable information.

Foreseen changes

For the following years it is planned to improve data from agricultural sector (section NACE A).

7 Specific issues - wet matter for sludges

Although the data on sludges are requested only in dry matter since the 2008 data collection, please indicate in the table below the amounts of waste generated for the NACE total in tonnes of wet matter. This will be important to review the conversion factors that have been used to impute missing data in the past.

03.2	**Industrial effluent sludges**		**W**	**6410**
03.2	**Industrial effluent sludges**		**W**	**21897**
11 (excl. 11.3)	**Common sludges (excl. dredging spoils)**		**W**	**67857**
11.3	**Dredging spoils**		**W**	**20877**

For industrial effluent sludges it was used conversion factor 0.27 while for the dredging spoils conversion factor was 0.5 in both case in accordance with Eurostat document "Wet – dry conversion of sludges**,** ARGUS for Eurostat – Environment Statistics"*.*

For common sludges it was used conversion factor 0.323 was used according to the information provided by the biggest waste water treatment plants.

8 Validation

1. Comparison over time (2018 – 2016)

a) (total/hazardous) waste generation by NACE

NACE B – Performed validation rule showed that in 2018 there was more hazardous waste than in 2016. It is about waste LoW 05 01 03* (tank bottom sludges) from oil industry.

NACE C24-C25 – Performed validation rule showed that in 2018 there was more hazardous waste than in 2016. It is about EWC-Stat 10.32 (Other sorting residues) that was in 2016 reported under the service sector by one company.

NACE D34-D35 – Performed validation rule showed that in 2018 there was less hazardous waste than in 2016. It's about LoW 16 07 08* (wastes containing oil). One thermal power plant stopped working in 2017.

NACE E36-E37-E39 – Performed validation rule showed that in 2018 there was more total waste than in 2016. It is about LoW 13 04 03* (bilge oils from other navigation). Recorded increase is result of business increase of one company from NACE E39.

b) hazardous share by NACE

Performed validation rule showed deviation in NACE C24-C25. Reasons are already explained above in validation 1.a).

c) treatment by operation [WST_OPER]

R1 – Performed validation rule showed that in 2018 there was more waste treated by operation R1. It is about LoW 03 01 01 (waste bark and cork). Recorded increase is result of easier issuing of authorization for energy recovery of own wooden waste. In this case it is about one manufacturer of builder's carpentry and joinery.

D10 – Performed validation rule showed that in 2018 there was no waste treated by operation D10 unlike in 2016. In 2016 some amount of health care and biological wastes (NHAZ) was incinerated although there is no issued permit for waste incineration. It is about LoW 18 01 02 (body parts and organs including blood bags and blood preserves except 18 01 03*) which ended up in the crematorium which according to the national legislation is not obliged to obtain waste management permit. Therefore in 2018 this kind of treatment wasn't reported.

d) Generation by waste category

This validation rule wasn't performed. We consider that it is covered by other validation rules, especially by validation rule 1.f).

Regarding data on household waste, from 2017 new EPR reporting forms have been introduced (see Chapter 5, Determination of waste generation in the economy on the basis of administrative sources). New reporting forms require more detailed data on waste origin, hence data on produced waste by households are more accurate than previous years and significantly differ from previous years.

Treatment by waste category

Spent solvents HAZ, Acid, alkaline or saline wastes NHAZ, Chemical wastes HAZ, Industrial effluent sludges HAZ – Higher amount in 2018 than in 2016. Data were checked and they are correct. One factory started with treatment of this waste.

Acid, alkaline or saline wastes HAZ – Lower amount in 2018 than in 2016. Data were checked and they are correct.

Industrial effluent sludges NHAZ – Higher amount in 2018 than in 2016. Data were checked and they are correct. Recorded increase is result of increase in paper production and increasing the capacity of the recycling line. Reconstruction of the treatment plant was also carried out and better efficiency of the treatment process was achieved. All of the above resulted in higher sludge production.

Sludges and liquid wastes from waste treatment HAZ – Lower amount in 2018 than in 2016. Data were checked and they are correct. One cement factory didn't receive LoW 19 02 08* (liquid combustible wastes containing dangerous substances) on R1 unlike in 2016.

Sludges and liquid wastes from waste treatment NHAZ – Higher amount in 2018 than in 2016. Data were checked and they are correct. One biogas plant start to receive LoW 19 02 06 (sludges from physico/chemical treatment other than those mentioned in 19 02 05) on anaerobic digestion.

Health care and biological wastes NHAZ – See explanation in 1.c).

Metal wastes, ferrous HAZ – Higher amount in 2018 than in 2016. Data were checked and they are correct. One steel plant began operations in 2017, expanding and modernizing the steel plant.

Wood waste HAZ – Data were checked and they are correct.

Wood waste NHAZ – See explanation in 1.c).

Discarded vehicles NHAZ - Separate collection of this fraction increased.

Mixed and undifferentiated materials HAZ – Lower amount in 2018 than in 2016. Data were checked and they are correct.

Sorting residues NHAZ - A significant increase in disposal is a consequence of the generation of secondary waste at MBT plant which started working in 2018.

Mineral waste from construction and demolition HAZ – Lower amount of railway sleepers generated as a result of the reconstruction of railways during 2018 which were in the same year forwarded to the waste treatment facilities.

Other mineral wastes HAZ – Performed validation rule showed that in 2018 there was less waste. Separate of collection of asbestos construction waste significantly decreased due to the abolition of the state fee for collectors.

Combustion wastes NHAZ - Performed validation rule showed that in 2018 there was less waste. Data were checked and they are correct. One thermal power plant stopped working in 2017.

Dredging spoils NHAZ - Higher amount in 2018 than in 2016 due to remediation of one landfill.

e) Relation treatment / generation by waste category

Spent solvents HAZ, Acid, alkaline or saline wastes HAZ, Acid, alkaline or saline wastes NHAZ – Performed validation rule showed that there is more waste generated than treated. That is in line with actual state in Croatia that significant amounts are pre-treated and exported out of state. The ratio of treated and produced waste is approximately the same in 2018 and 2016.

Chemical wastes HAZ, Industrial effluent sludges HAZ – Higher amount of treated waste in 2018 than in 2016. Data were checked and they are correct. One factory started with treatment of this waste.

Sludges and liquid wastes from waste treatment HAZ – Lower amount in 2018 than in 2016. Data were checked and they are correct. One cement factory didn't receive LoW 19 02 08* (liquid combustible wastes containing dangerous substances) on R1 unlike in 2016.

Health care and biological wastes NHAZ – See explanation in 1.c).

Metal wastes, ferrous HAZ – Higher amounts in 2018 than in 2016. Data were checked and they are correct. One steel plant began operations in 2017, expanding and modernizing the steel plant.

Wood waste HAZ – Data were checked and they are correct.

Wood waste NHAZ – See explanation in 1.c).

Discarded equipment (excl. Discarded vehicles, batteries/accumulators) NHAZ – Separate collection of this fraction increased.

Mineral waste from construction and demolition HAZ, Dredging spoils NHAZ – See explanation in 1.d).

f) generation (largest differences for inner cells):

Regarding data on household waste, from 2017 new EPR reporting forms have been introduced (see Chapter 5, Determination of waste generation in the economy on the basis of administrative sources). New reporting forms require more detailed data on waste origin, hence data on produced waste by households are more accurate than previous years and significantly differ from previous years. Consequently, data on waste from service sector also significantly differ for some waste categories from data for previous years.

Acid, alkaline or saline wastes HAZ – NACE C19 – Higher amount in 2018 than in 2016. Data were checked and they are correct.

Acid, alkaline or saline wastes HAZ – NACE C24-C25 – Higher amount in 2018 than in 2016. Data were checked and they are correct. It is about waste treatment company (treatment of waste batteries and accumulators) that reported data for 2016 in service sector and in 2018 reported under the NACE C24.

Used oils HAZ – It is about oil company that reported data for 2016 in NACE C19 and in 2018 reported under the NACE B.

Used oils HAZ, Chemical wastes HAZ – NACE sections G – U excl. 46.77 – Lower amount in 2018 than in 2016. Data were checked and they are correct.

Industrial effluent sludges NHAZ, Sludges and liquid wastes from waste treatment HAZ – See explanation in 1.d).

Metal wastes, ferrous NHAZ – NACE E38 – Higher amount in 2018 than in 2016. Recorded increase is result of business increase of one big waste treatment company.

Metal wastes, ferrous NHAZ – NACE C20-C22 – In 2014 new waste legislation on end of waste status and by-products entered into force. In accordance with that legislation some factories obtained certificate on by-products for metals and other residues. Hence, in 2018 recorded waste amounts for some streams are lower than previous years.

Glass wastes NHAZ – Separate collection of this fraction increased.

Paper and cardboard wastes NHAZ – NACE E38 – Since China stopped receiving waste paper for processing, recovered quantities increased in the country.

Wood wastes NHAZ – NACE 16 – See explanation 1.c).

Wood wastes NHAZ – NACE C20-C22, C26-C30, C31-C33 – Performed validation rule showed that in 2018 there was less waste. In 2014 new waste legislation entered into force and as a result some wood factories obtained certificate on by-products for wood residues. Therefore smaller amounts are categorized as waste.

Discarded equipment (excl. Discarded vehicles, batteries/accumulators) NHAZ – **NACE E38** – Separate collection of this fraction increased.

Animal and mixed food waste NHAZ – **NACE sections G – U excl. 46.77** – Separate collection of this fraction increased.

Vegetal wastes NHAZ – NACE A – Performed validation rule showed that in 2018 there was less waste. Data were checked and they are correct. It is about LoW 02 01 03 (plant-tissue waste) that was used in biogas plant as silage.

Animal faeces, urine and manure NHAZ – NACE A – Performed validation rule showed that in 2018 there was more waste. Data were checked with biogas plants and they are correct.

Other mineral wastes HAZ – NACE F – Performed validation rule showed that in 2018 there was less waste. Separate of collection of asbestos construction waste significantly decreased due to the abolition of the state fee for collectors. Additionally, better data quality.

Combustion waste NHAZ – NACE D – Data were checked and they are correct. One thermal power plant stopped working in 2017.

Combustion waste NHAZ – NACE E38 – Lower amount in 2018 than in 2016. Recorded decrease is result of business decrease of one big waste treatment company.

Treatment (largest differences for inner cells):

Chemical wastes HAZ – Higher amount of treated waste in 2018 than in 2016. Data were checked and they are correct. One factory started with treatment of this waste.

Paper and cardboard wastes NHAZ – Although in 2018 was recorded increase of separate collection of this type of waste, amounts of pre-treated waste increased too. Therefore, amounts that are treated by final treatment operations decreased.

Textile wastes NHAZ – Although in 2018 was recorded increase of separate collection of this type of waste, amounts of pre-treated waste increased too. Therefore, amounts that are treated by final treatment operations decreased. Higher amounts were exported.

Plastics wastes NHAZ – Separate collection of this fraction increased.

Discarded equipment (excl. Discarded vehicles, batteries/accumulators) HAZ – Higher amounts were exported.

Vegetal wastes NHAZ – Higher amount of composted waste in 2018 than in 2016. Data were checked and they are correct.

Household and similar wastes NHAZ – There was significant decrease of disposed mixed municipal waste due to the treatment of this type of waste at MBT plant which started working in 2018. According to the issued permit MBT is considered as pre-treatment process but not a final treatment operation. Regarding treatment processes R2-R11, data were checked and they are correct. It is about bulky waste LoW 20 03 07.

Mixed and undifferentiated materials NHAZ – Separate collection of LoW 15 01 06 significantly increased.

Sorting residues NHAZ – Recycling is less than in 2016 because the waste is no longer handed over to the MBT plant but to disposal which has increased.

Common sludges (NHAZ) – Regarding R1 operation amounts are increased due to receiving this type of waste on the treatment in cement industry. In 2018 there was less amount landfilled due to increased export out of the country.

Mineral waste from construction and demolition NHAZ – Lower amounts in 2018 than in 2016 for backfilling and disposal due to reduction of construction activities.

Soils NHAZ, Mineral waste from waste treatment and stabilized wastes NHAZ – Better data quality due to new reporting forms for backfilling which was reported as disposal in previous year. Additionally, disposal was reduced.

For other, please see previous validation results.

2. Relation generation / treatment (totals)

Performed validation rule showed that there is more hazardous waste generated than treated. That is in line with actual state in Croatia that significant amounts are pre-treated. Also Croatia exports hazardous waste.

Performed validation rule showed that there is more non-hazardous waste generated than treated. For the purpose of improving the data quality during 2016 and 2017, the MEE/Institute implemented the project "Improvement of data flow and data quality regarding construction waste and waste from the exploration and exploitation of mineral raw materials". Within this project data on generated waste were estimated and those data were included in set 1 WStatR while data on final destination of estimated amounts are not known.

3. Implausible combinations treatment operation / waste categories

Performed validation rule showed that in 2018 there was implausible combinations for treatment operation / waste categories.

EWC-Stat 12.1 (LoW 17 02 04*) – R1 – This type of waste (railway sleepers) is used in the process of production of quicklime. From waste that enters the process of energy recovery, there is ash in different percentages that is incorporated into the product.

EWC-Stat 12.4 (LoW 10 11 15*) – R1 – Cement industry – This type of waste is used in the process of production of clinker.

4. Treated amounts vs. treatment capacities (incineration)

Performed validation rule showed that in 2018 treated amounts were below available capacities for energy recovery (R1).

Additionally, data on special waste categories (packaging waste, waste tyres, waste oils, waste batteries and accumulators, end-of-life vehicles, waste electric and electronic equipment, waste containing asbestos) were cross-checked with data collected by EPEEF according to ordinances on special waste categories above mentioned.

Part II: Report on quality attributes

1 Relevance

The main users of the data contained in the report according to WSR are:

- Croatian Bureau of Statistics, Ministry of Environment and Energy, Environment Protection and Energy Efficiency Fund, County offices, The State Inspectorate and other authority bodies
- Private persons, companies, research institutes…

Description of missing data in data set 1 on waste generation

NACE A

In Croatia straw is mainly used as a product, except spoiled amounts which are very small and no data is available to estimate its amount.

Other data which are missing:

- Part of the data on packaging waste (pesticides packaging, seeds packaging…), pesticides, discarded equipment, batteries and accumulators, used oils, wood waste, vegetal waste.

It is foreseen for the near future to carry out study for the determination, calculation and estimation the waste amounts generated in agricultural sector.

Description of missing data in data sets 2 and 3 on treated waste quantities and capacities:

Data are complete.

2 Accuracy

N/A (Not Applicable).

3 Timeliness and punctuality

Datasets 1 and 2:

As it is mentioned in the previous chapters, data used for the compilation of Dataset 1 and Dataset 2 of WStatR 2018 are mostly based on the data reported by waste producers/holders, waste collectors and waste management companies into the EPR database.

Companies report data via Internet by means of user name and password that are assigned by the MEE/Institute. The deadline for reporting data 2018 was 31st of March 2019. Until 15th of May 2019, 20 county offices and the office of the City of Zagreb should ensure the checking of data quality in terms of their completeness, consistency and credibility by verification.

After the data verification made by counties was finished, the MEE/Institute provided final check of the verified data by the end of the December 2019.

In January 2020, data reported into the EPR database were converted by special application to the format requested by WStatR. When data conversion was done, MEE/Institute started with data preparation for the WStatR.

Part of the data on animal by-products additionally requested from the Ministry of Agriculture were delivered in May 2020.

After the compilation of datasets 1 and 2 was done (at the end of May), before delivery to the Eurostat, MEE/Institute preformed validation rules according Eurostat recommendation. Results of the preformed validation rules are presented in the chapter 8 (Validation).

Dataset 3:

Data on number of waste treatment facilities and capacity for energy recovery (R1), waste incineration (D10) and recovery (R2-R11) were extracted from the WMPR database. Validation of the data contained in the mentioned database is carried out continuously during entering data from permits into the database WMPR.

Regarding capacities for treatment of animal by-products, according to the Regulation (EC) No 1069/2009 and Regulation (EC) No 142/2011, Ministry of Agriculture, Directorate for Veterinary and Food Safety maintains registers for carrying out anaerobic digestion and incineration of animal by-products. By entering into force of the new Act on Sustainable Waste Management (OG No 94/13) in 2013 those facilities are also obliged to obtain permits according to the mentioned Act. Hence, part of the data on capacities for anaerobic digestion and incineration of animal by-products are provided by Ministry of Agriculture while majority data were extracted from WMPR database.

Regarding data on rest capacity of landfills, according to the Act on Sustainable Waste Management (OG No 94/13, 73/17, 14/19, 98/19), the landfill operator should submit data into database Central Management System for the Data on Landfills of Waste maintained by MEE/Institute. Data should be submitted twice a year within 30 days of the expiry of each half-year period. Therefore, data for 2018 were reported by the end of the January 2019. Validation of reported data was performed during February 2019.

4 Accessibility and clarity

The data and information on waste are disseminated primarily on website of the MEE/Institute (http://www.haop.hr/). The web page provides access to databases that contain reported and collected data on waste:

publications and reports:

- http://www.haop.hr/hr/tematska-podrucja/otpad-registri-oneciscavanja-i-ostali-sektorski-pritisci/gospodarenje-otpadom-0,
- http://www.haop.hr/hr/tematska-podrucja/otpad-registri-oneciscavanja-i-ostali-sektorski-pritisci/postrojenja-i-registri-2,

indicators:

- http://www.haop.hr/hr/tematska-podrucja/otpad-registri-oneciscavanja-i-ostali-sektorski-pritisci/gospodarenje-otpadom-3,
- http://www.haop.hr/hr/tematska-podrucja/otpad-registri-oneciscavanja-i-ostali-sektorski-pritisci/postrojenja-i-registri-0,

public browsers:

- http://roo.azo.hr/rpt.html,
- http://www.haop.hr/hr/informacijski-sustavi/informacijski-sustav-zastite-okolisa/gospodarenje-otpadom.

Data were also published using LoW classification in Statistical Yearbooks (http://www.dzs.hr/default_e.htm).

Regarding clarity, MEE/Institute publishes on its websites legislation, manuals and instructions for companies, questionnaires etc (http://www.haop.hr/hr/tematska-podrucja/otpad-registri-oneciscavanja-i-ostali-sektorski-pritisci/gospodarenje-otpadom).

Additionally, data and information are disseminated by meetings and workshops. Also data and information are available on request by phone and info mail (http://www.haop.hr/hr/kontakt) or Information Access Request in accordance with the Act on the Right of Access to Information (OG No 25/13, 85/15) for the professional and other interested public.

Comparability

On the national level only the comparability of the data on special waste streams is possible because this is the only case of parallel data collection (EPEEF and MEE/Institute).

Data collected by CBS up to 2010 and data collected by MEE/Institute are incomparable because of two different methodologies used for data collection.

Regional comparability of data on waste treatment facilities:

Waste management permits are issued for the location of waste treatment facilities.

Regarding mobile waste treatment facilities, the permit are issued for each treatment location. If the permit for mobile waste treatment facility is issued for the locations belonging to the two different NUTS regions, this treatment facility is added to the region where the company operator is located.

6 Coherence

Data reported according to WStatR were used also for the preparation of environmental indicators and national reports.

7 Burden on respondents

There are about 5000 NO forms (from about 2800 companies) and 360 OZO forms (from about 300 companies) filled for reporting year 2018. These forms are prescribed by the Ordinance on Environmental Pollution Register (OG No 87/15). They are filled electronically so there are some prefilled general fields, automatic checks and available data for previous reporting year in order to shorten the time necessary for data submission. If there is a need, according to the reporting obligation of Republic of Croatia, MEE/Institute asks companies for additional information. There are also manuals, instructions and FAQ available on MEE/Institute webpage.