EUROPEAN COMMISSION
EUROSTAT

Directorate E: Sectoral and regional statistics
Unit E-3: Environment and forestry

28 June 2016

Quality Report
on Waste Statistics 2014

1 Heading (QR_WASTE_HR_2014_1)

Part I: Description of the data

2 Identification

Country name **Croatia**

Reference year **2014**

Description of data set(s) delivered

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

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 **28 June 2016**

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

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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
Croatian Agency for the Environment and Nature (CAEN)	Collects, checks, processes and delivers (submits) data according to WSR. Maintains the Waste Management Information System - Environmental Pollution Register (EPR), Waste Management Permits Register, Central Management System for the Data on Landfills of Waste, Database on transboundary movement of waste, etc.
Ministry of Environmental and Nature Protection (MENP)	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, Register of Persons Storing Their Own Industrial Waste, and Register of Persons Dealing with Energy Recovery from Waste).
The 20 county offices and office of the City of Zagreb	In cooperation with the competent inspection ensure the checking of reported data to EPR in terms of their completeness, consistency and credibility. Responsible for issuing the permits which are not covered by MENP.

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

The *Croatian Agency for the Environment and Nature (CAEN)* is a public institution, legal successor of the *Croatian Environment Agency* established by the Croatian Government in June 2002. 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. By the *Environmental Protection Act (OG No 80/13, 78/15)* the CAEN 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. In 2012, through an agreement between the *CAEN* and *Croatian Bureau of Statistics (CBS)*, responsibilities for the preparation and submitting of data according to WSR to *Eurostat* were transferred from *CBS* to the *CAEN*. Data on Waste statistics for the reference year 2010 and previous years were delivered by the *CBS*.

According to the *Environmental Protection Act (OG No 80/13, 78/15), Act on Sustainable Waste Management (OG No 94/13) and subordinate legislation*, *CAEN* 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 35/08).* It contains annual data on waste generators (> 50 kg hazardous and/or > 2000 kg 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. A new *Ordinance on EPR* (OG No 87/15) entered into force in 2015 but that didn't effect data on reporting year 2014.

Waste Management Permits Register (WMPR) database contains information and documents on waste management permits (for hazardous, non-hazardous and municipal waste), certificates of registration in the *Register of waste carriers, mediators and exporters of non-hazardous waste for recovery*.

Central Management System for the Data on Landfills of Waste –according to the *Act on Sustainable Waste Management (OG No 94/13)* all landfill operators are obliged to report data on landfills twice a year into to this database. 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)* importers and exporters of waste are obliged to submit yearly report on quantities and types of shipped waste to the *CAEN*.

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 the *Ordinance on animal by-products not intended for human consumption (OG No 87/09)*, *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 diegstion 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 CAEN.

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)

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																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
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11																			
12																			
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35																			
36																			
_...._																			
39																			
40																			
41																			
42																			
43																			
44																			
45																			
46																			
47																			

Waste Item	Source																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
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
	Data reported by waste producers/holders, waste collectors and waste treatment facilities + estimations

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

- Spent solvents (code 01.1) - in NACE sections G – U excl. 46.77 the combination of data reported by waste generators 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 in NACE sections G – U excl. 46.77 there are significant number of small enterprises which produce this type of waste but do not exceed the annual threshold of 50 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.

- Chemical waste (code 01.4, 02, 03.1) – in NACE section A, divisions C13-15, C16, C19, C20-22, C24-C25 and NACE sections G – U excl. 46.77 the combination of data reported by waste generators and waste treatment facilities were used. By checking the coverage of the companies which reported data into the EPR it was determinate that in mentioned divisions there are significant number of small enterprises which do not exceed the annual threshold of 50 kg of hazardous waste and therefore they are not obliged to report data into the EPR.

- Metallic wastes, ferrous and non-ferrous (code 06.1, 06.2), Glass wastes (code 07.1) – in NACE section F the combination of data reported by waste generators and waste treatment facilities were used. The difference in quantities reported by waste treatment facilities and waste generators was taken into consideration. Additionally, the allocation of reported data on construction and demolition waste belonging to those waste categories from other economic sections to section F was made.

- Rubber wastes (code 07.3) – in NACE sections G – U excl. 46.77 the combination of data reported by waste generators 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.

- Discarded equipment (excl. discarded vehicles, batteries/accumulators) (code 08 excl. 08.1, 08.41)) – in NACE sections G – U excl. 46.77 the combination of data reported by waste producers/holders and waste treatment facilities were used. It was not possible to distinguish quantity of discarded equipment which originates from class 46.77, so the quantity from this class was included in services sector (sections G – U without 46.77).

- Discarded vehicles (code 08.1) - in activity item households the combination of data reported by waste generators and waste treatment facilities were used in a way that it was taken into consideration the difference in quantities reported by waste treatment facilities and waste generators. This assumption was made on the basis of the information on origination of discarded vehicles provided by waste treatment facilities.

- Animal and mixed food waste (code 09.1) – in NACE Section A and NACE C10- C12 - data on animal tissues were determinate on the basis of data reported by incinerators to the Ministry of Agriculture and data reported into the database EPR.

- Vegetal wastes (code 09.2) - in NACE sections G – U excl. 46.77 the combination of data reported by waste generators and waste treatment facilities were used. The difference in quantities reported by waste treatment facilities and waste generators was taken into consideration. By checking the coverage of the companies which reported data into the EPR it was determinate that in mentioned divisions there are significant number of small enterprises which do not exceed the annual threshold of 2000 kg of non-hazardous waste and therefore they are not obliged to report data into the EPR.

- Animal faeces, urine and manure (code 09.3) – 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. This waste was added to Section A.

- Mixed and undifferentiated materials (code 10.2) – in NACE C17-18, G – U excl. 46.77 - the combination of data reported by waste generators and waste treatment facilities were used. The difference in quantities reported by waste treatment facilities and waste generators was taken into consideration. By checking the coverage of the companies which reported data into the EPR it was determinate that in mentioned divisions there are significant number of small enterprises which do not exceed the annual threshold of 2000 kg of non-hazardous waste and therefore they are not obliged to report data into the EPR.
- Mineral waste from construction and demolition (code 12.1), other mineral waste (code 12.2, 12.3, 12.5), soils (code 12.6), dredging spoils (code 12.7) – in NACE F; Combustion waste (code 12.4) in Section D; Mineral waste from waste treatment and stabilised wastes (code 12.8, 13) - the combination of data reported by waste generators and waste treatment facilities were used. The difference in quantities reported by waste treatment facilities and waste generators was taken into consideration.

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

- Acid, alkaline or saline wastes (code 01.2) - NACE divisions C20-22, C24-25, C26-30 and E38 – mostly the combination of data reported by waste generators and waste collectors were used. By checking the coverage of the companies which reported data into the EPR it was determined that in mentioned divisions there are significant number of small enterprises which do not exceed the annual threshold and therefore they are not obliged to report data into the EPR.

- Used oils (code 01.3) – NACE sections G – U excl. 46.77 – the combination of data reported by waste generators and waste collectors were used. The difference in quantities of used oils reported by waste collectors and waste generators was determined and allocated among above mentioned sectors. By checking the coverage of the companies which reported data into the EPR it was determinate that in NACE sections G – U excl. 46.77 there are significant number of small enterprises which do not exceed the annual threshold of 50 kg of hazardous waste, so they are not obliged to report data into the EPR.

- Industrial effluent sludges (code 03.2) - in NACE sections G – U excl. 46.77 the combination of data reported by waste generators and waste collectors were used. By checking the coverage of the companies which reported data into the EPR it was determined that in NACE sections G – U excl. 46.77 there are significant number of small enterprises which do not exceed the annual threshold of 50kg of hazardous waste, so they are not obliged to report data into the EPR.

- Health care and biological wastes (code 05) - in NACE sections G – U excl. 46.77 the combination of data reported by waste generators and waste collectors were used. By checking the coverage of the companies which reported data into the EPR it was determined that in NACE sections G – U excl. 46.77 there are significant number of small enterprises (e.g. small ambulances) which do not exceed the annual threshold of 50 kg of hazardous waste, so they are not obliged to report data into the EPR.

- Metallic wastes, mixed ferrous and non-ferrous (code 06.3) – in NACE section F the combination of data reported by waste generators and waste collectors were used. The difference in quantities reported by waste collectors and waste generators was taken into consideration. Additionally, the allocation of reported data on construction and demolition waste belonging to this waste category from other economic sections to section F was made.

- Glass wastes (code 07.1), Plastic wastes (code 07.4), Wood wastes (07.5) – in sections G – U excl. 46.77 - the combination of data reported by waste collectors (industrial waste collectors and municipal waste collectors) and data reported by waste generators were used. The difference in quantities reported by waste collectors 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. Additionally, the allocation of reported data on construction and

demolition waste belonging to this waste category from other economic sections to section F was made.

- Paper and cardboard wastes (code 07.2) – NACE divisions C10-12, C17-18, C31-33, NACE sections G – U excl. 46.77 - the combination of data reported by waste generators and waste collectors were used. The difference in quantities of paper and cardboard wastes reported by waste collectors and waste generators was determinate and allocated among above mentioned divisions. By checking the coverage of the companies which reported data into the EPR it was determined that in mentioned NACE activities there are significant number of small enterprises which do not exceed the annual threshold of 2000 kg of non-hazardous waste and therefore they are not obliged to report data.
- Batteries and accumulators wastes (code 08.41)– in NACE sections G – U excl. 46.77 the combination of data reported by waste collectors and data reported by waste generators were used. The difference in quantities reported by waste collectors 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. For households only data reported by municipal waste collectors were used.
- Animal and mixed food waste (code 09.1) –biodegradable kitchen and canteen waste and edible oil and fat - the combination of data reported by waste collectors and data reported by waste generators were used. The difference in quantities reported by waste collectors and waste generators was taken into consideration. The difference between those sources was added to services sector from which this waste originates.

- Other mineral wastes (code 12.3) – in NACE sections G – U excl. 46.77 other non-biodegradable waste - the combination of data reported by municipal waste collectors and data reported by waste generators were used. The difference in quantities reported by municipal waste collectors and waste producers/holders was taken into consideration. The difference between those sources was added to services sector from which this waste presumably originates.

- Combustion wastes (code 12.4) – in NACE section D - the combination of data reported by waste collectors and data reported by waste generators were used. The difference in quantities reported by waste collectors and waste generators was taken into consideration.

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.

Companies report EPR data via Internet by means of user name and password that are assigned by the CAEN. The deadline for reporting is 1st of March current year for the previous calendar year. From 1st of March until 15th of June, 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 CAEN coordinates activities relating to data quality assurance and control.

Waste generators producing more than 50 kg of hazardous waste and/or more than 2000 kg of non-hazardous per a year are obliged to report annual data on registration forms PL-PPO (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 forms PL-SPO (Registration form for collector/carrier of industrial waste). Except general data on waste collector, forms PL-SPO 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 registration forms PL-SKO (Registration form for municipal waste collector/carrier). Registration forms PL-SKO 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 PL-OPKO (Registration form for recovery/disposal operator of industrial and/or municipal waste). Form PL-OPKO 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.

All EPR registration forms (PL-PPO, PL-SPO, PL-SKO, and PL-OPKO) are attached to this Quality report.

As some bio-plants and incineration plants for animal by-products still in 2014 didn't obtain waste management permits according to the new act, 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

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				
Partially covered				
Generally excluded	x	x	x	x

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

At the moment CAEN is carrying out the project on the estimation of extractive waste quantities and C&D waste quantities. The end of the project is foreseen for the beginning of the 2017. Within mentioned project, data required by table 4 should be determined.

Determination of waste generated by households

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. Due to lack of data on number of employees in class 46.77, data on mixed municipal waste produced by this class are included in services sector Section G-U exclud. 46.77.

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.

Additionally, within the project *Data collection on food waste statistics* (year - 2013 / 2014) special survey among municipal waste companies was conducted. Municipal waste companies delivered data on shares of mixed municipal waste for each of three sectors (households, commercial, and the rest of economy sectors). Results were quite the same to those derived by applying the methodology described above. Therefore, the corrections weren't made.

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 and waste treatment facilities
1.2	Description of the reporting system (regular survey on waste collectors, utilisation of administrative sources)	Annual reports into the EPR + additional estimations for population not covered by organised collection of municipal waste and for 3 municipalities/ towns for which data weren't reported.
1.3	Waste types covered	15 01 and 20 (households, commercial)
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	Municipal waste collectors provided to the Agency the shares of mixed municipal waste (LoW 20 03 01) produced by households, commercial sector and other economic sectors. For other types of municipal data on sources (household and commercial activities) are not available hence those amounts are jointly added to households or to commercial activities.
1.6	Percentages of waste from commercial activities by waste types	Data not available
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	Waste treatment
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 CAEN the shares of discarded vehicles taken from households (99%) and commercial activities (0.75%). As provided shares weren't comparable with data reported to the EPR 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	5.2%

Estimation of non-covered amount of municipal waste:

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

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 the CAEN. 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 Ministry of Environmental and Nature Protection. For all other types of waste competent authorities are county offices and City of Zagreb office. CAEN 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%. Only the data on number and capacity 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 number of waste treatment facilities are obtained from the WMPR database.

For providing data on capacities of treatment facilities several sources were used. Most of the data were extracted from WMPR database. In certain number of cases data from EPR database were used or were obtained contacting directly waste treatment facilities.

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. According to the information provided by the company, there wasn't any incineration of technical fat in 2014.

6 Major Changes

Changes compared with previous years

By the agreement from May 2012 between CAEN and Croatian Bureau of Statistics, CAEN 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 CAEN uses administrative source of data.

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 CAEN converted tonnes into the cubic meters by using general density coefficients, while for the year 2014 operators had to report by themselves data in cubic meters what is considered to be more reliable information.

Foreseen changes

Until next reporting period it is planned to improve data from agricultural sector (section NACE A), mining sector (section NACE B), and construction and demolition sector (section NACE F).

At the moment CAEN is carrying out the project on the estimation of extractive waste quantities (NACE B) and C&D waste quantities (NACE F). The end of the project is foreseen for the beginning of 2017.

Also the project on the improvement of data on agricultural waste (NACE A) is foreseen for 2017.

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**	**5359**
03.2	**Industrial effluent sludges**		**W**	**10190**
11 (excl. 11.3)	**Common sludges (excl. dredging spoils)**		**W**	**57320**
11.3	**Dredging spoils**		**W**	**-**

For industrial effluent sludges it was used conversion factor 0.27 in accordance with Eurostat document *Wet – dry conversion of sludges, ARGUS for Eurostat – Environment Statistics.*

For common sludges in all NACE activities, besides NACE E36_E37_E39 and NACE G – U excl. 46.77, conversion factor 0.27 was used. In the NACE E36_E37_E39 the combination of factors 0.27 and 0.31 was

used and in the NACE G – U excl. 46.77 conversion factor 0.31 was used according to the information provided by the biggest waste water treatment plants.

8 Validation

1. comparison over time (2014 – 2012)

a) (total /hazardous) waste generation by NACE

NACE C19 - Performed validation rule showed that in 2014 there was more soils (LoW 17 05 03*) reported due to remediation of polluted soil after accidental spill from oil pipeline.

NACE C23 - There was more sorting waste reported under LoW 19 12 11* than under 19 12 12 in 2014. This is due to laboratory findings that showed increased level of DOC in waste that is consisted of waste labels and bottle stickers from glass recycling process.

NACE E38 - There is more sorting waste (LoW 19 12 11*) reported due to correction of inadequately selected NACE of one waste collector that was in 2012 reported under service sector.

b) hazardous share by NACE

NACE C23 and **NACE E38** - Performed validation rule showed that in 2014 there was more waste reported under mentioned NACE activities and this is already explained above in validation 1.a).

NACE C24-C25 - In 2014 amounts of total waste increased (mainly non-hazardous combustion waste – ashes and slags) and amounts of hazardous waste decreased compared to 2012. In 2012 higher amounts of hazardous waste were a result of reconstruction of one electrodes factory.

c) treatment by operation [WST_OPER]

R1 - Performed validation rule showed that in 2014 there was more waste treated by operation R1. Data were checked with the waste treatment facilities and they are correct.

D10 - There is less waste incinerated and that is in line with EPR data for crematorium, the only plant that carries out the treatment operation D10 in Croatia.

R2-R11 - There is more waste recycled due to the several reasons: shifts from D1 to R5 in 2014 of mineral waste from construction and demolition, more amounts of ferrous metal waste generated in 2014 and hence treated etc. See results of validation rule 1.d) Treatment by waste category.

Backfilling - There is more waste being backfilled in 2014. Data were checked with the landfill operators and they are correct.

Other disposal - There is more reported waste under this column due to increased amount of waste treated by D3 after the changes in waste handling process of one waste treatment facility (new installed pre-treatment device).

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).

Treatment by waste category

Industrial effluent sludges HAZ – Higher amount reported in 2014 due to one cement factory that took over more waste (LoW 16 07 08*) for energy recovery.

Health care and biological wastes NHAZ – Higher amount reported in 2014 due to one energy plant that started with energy recovery of this type of waste in 2013.

Metal wastes, ferrous NHAZ - Two big factories for manufacture of steel started working in 2013, therefore higher amounts of metals were treated in Croatia in 2014 and weren't exported out of Croatia. Additionally, higher amounts of generated metal ferrous waste are reported in 2014.

Plastic wastes NHAZ – In 2014 higher amount of reported waste that was imported for waste recycling and treatment of significant amount of waste from temporary storage that was generated in previous years.

Wood wastes NHAZ – 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 of treated wood waste were reported in 2014.

Discarded vehicles NHAZ - Higher amount in 2014 than in 2012. Data were checked with the waste treatment facilities and they are correct. Also higher amounts of generated discarded vehicle in 2014 were reported.

Sorting residues NHAZ - Higher amount of waste generated from mechanical treatment (LoW 19 12 12) in 2014 which was in 2012 landfilled without pre-treatment as mixed municipal waste (LoW 20 03 01).

Common sludges NHAZ – Higher amount of reported sludges from treatment of urban waste water (LoW 19 08 05) which are from 2013 considered as landfilled after several years of temporary storage at the location of waste water treatment plant.

Mineral waste from construction and demolition HAZ – Higher amount of railway sleepers generated as a result of the reconstruction of railways during 2014 which were in the same year forwarded to the waste treatment facilities.

Combustion wastes HAZ - Negligible amount of waste (LoW 10 03 15*) was reported only in 2014. Data were checked with the waste treatment facility and they are correct.

Dredging spoils NHAZ - Lower amount in 2014 than in 2012. It is about dredging spoil (LoW 17 05 06) generated in the process of remediation of landfill that took place in 2012.

e) <u>relation treatment / *generation by waste category*</u>

Industrial effluent sludges (HAZ), Metal wastes, ferrous (NHAZ), Metal wastes, mixed ferrous and non-ferrous (NHAZ), Wood wastes (HAZ) and Sorting residues (NHAZ) - Performed validation rule showed larger differences due to the more deep data analysis that has resulted in a better data quality in 2014.

Validation rule also showed difference for **Spent solvents (HAZ)** that is due to increased amounts of generated waste in 2014 and less treated in Croatia.

Difference for **Health care and biological wastes (NHAZ)** is due to fact that one power plant started with recovery of this type of waste (LoW 18 01 04) in 2014.

There is less reported generated **Wood wastes (NHAZ)** due to change in national law that now classifies it as a by-product.

Common sludges (NHAZ) are from 2013 considered as landfilled after several years of temporary storage at the location of waste water treatment plant as explained under 1.d).

Difference for **Mineral waste from construction and demolition (HAZ)** is due to temporary storage of railway ties after reconstruction in 2012 on the location of waste generator that in 2014 were forwarded to waste treatment facility.

Difference for **Combustion wastes (HAZ)** are due to lower quantities of exported combustion waste in 2014 than in 2012.

f) generation (largest differences for inner cells):

NACE F - Soils NHAZ - Lower amount in 2014 than in 2012. Data were checked and they are correct.

NACE F - Metal wastes, ferrous NHAZ – Higher amount in 2014 than in 2012. Data were checked and they are correct. One of the main reasons of increased amounts was a reconstruction of aluminium factory in 2014.

NACE E38 - Sorting residues NHAZ - Higher amount in 2014 than in 2012. It is due to waste (LoW 19 12 12) generated from mechanical treatment of mixed municipal waste (LoW 20 03 01) in 2014. In 2012 this waste wasn't pre-treated, hence it was belonging to the EWC *Household and similar waste*.

EP-HH - Household and similar wastes NHAZ - Lower amount in 2014 than in 2012. Generally in 2014 for all types of municipal waste decreased amounts were reported.

NACE G-U - Mineral waste from construction and demolition NHAZ - Higher amount in 2014 than in 2012 due to the reconstruction of aluminium factory**.**

NACE C10-C12 - Vegetal wastes NHAZ - Higher amount in 2014 than in 2012. In 2014 increased amount of sugar beet for processing is reported. Additionally, in 2014 vegetal waste (LoW 02 01 03) generated in the sugar beet processing was forwarded to biogas plants. In previous years it was forwarded to the farmers as livestock feed.

NACE E38 - Paper and cardboard wastes NHAZ – Higher amount in 2014 than in 2012. Data were checked with waste treatment facilities and they are correct.

NACE E38 - Metal wastes, ferrous NHAZ – As a consequence of increased amounts of metal ferrous waste in NACE F, the amount of secondary waste (LoW 19 12 02) in this NACE also increased.

NACE E38 - Metal wastes, mixed ferrous and non-ferrous NHAZ – Higher amount in 2014 than in 2012 due to the more deep data analysis that has resulted in a better data quality in 2014.

NACE G-U - Soils NHAZ - Higher amount in 2014 than in 2012 due to increased activities on construction and reconstruction of roads.

NACE C16 - Wood wastes NHAZ - Lower amount in 2014 than in 2012. After the entry into force of the new waste legislation, some wood factories obtained certificate on by-products for wood residues therefore smaller amounts of generated wood waste were reported in 2014.

NACE G-U - Mixed and undifferentiated materials NHAZ – Higher amount in 2014 than in 2012 due to the more deep data analysis that has resulted in a better data quality in 2014.

NACE C24-C25 - **Combustion wastes NHAZ** - Higher amount in 2014 than in 2012. Two big factories for manufacture of steel started working in 2013 hence the higher amounts of slags and ashes were reported in 2014.

NACE E38 - **Combustion wastes NHAZ** - Lower amount in 2014 than in 2012. The reason is furnace slag (LoW 10 09 03) which has been temporary stored in previous years in steel factory.

NACE A - Vegetal wastes NHAZ - Higher amount in 2014 than in 2012 due to fact that several biogas plants started working. Therefore more vegetal waste originating from farms ended up in those biogas plants and reported amounts were higher.

NACE G-U - Other mineral wastes NHAZ – Lower amount in 2014 than in 2012 due to dusty and powdery wastes (LoW 01 04 10) generated during the preparation of raw material for road construction. In 2013 one big company purchased new installation for the preparation of raw material and thereby avoided this type of waste. Hence in 2014 the amounts were lower.

NACE G-U - Paper and cardboard wastes NHAZ - Lower amount in 2014 than in 2012. Data were checked and they are correct. Commercial sector generated lower amounts of paper waste packaging.

EP-HH - Discarded vehicles HAZ - Lower amount in 2014 than in 2012. Data were checked with the waste treatment facilities and they are correct.

NACE G-U - Household and similar wastes NHAZ - Lower amount in 2014 than in 2012. Generally in 2014 for all types of municipal waste decreased amounts are reported.

EP-HH - Metal wastes, mixed ferrous and non-ferrous NHAZ – Lower amount in 2014 than in 2012 as a consequence that citizens in 2014 have brought lower amounts of metal waste into amenity sites.

treatment (largest differences for inner cells):

R2-R11 - Metal wastes, ferrous NHAZ - Higher amount in 2014 than in 2012. Two big factories for manufacture of steel started working in 2013, therefore higher amounts of metals were treated in Croatia in 2014.

D1-D5-D12 - Soils NHAZ - Lower amounts in 2014 than in 2012 due to change in waste treatment operation from D1 to R5.

D1-D5-D12 - **Household and similar wastes NHAZ** - Lower amounts in 2014 than in 2012. Generally in 2014 for all types of municipal waste decreased amounts are reported.

R2-R11- Mineral waste from construction and demolition NHAZ - Higher amount in 2014 than in 2012 due to construction and demolition work on the location of aluminium factory and change in waste treatment operation from D1 to R5.

R2-R11 - Combustion wastes NHAZ - Higher amount in 2014 than in 2012 due to change in waste treatment operation from D9 to R5.

R2-R11 - Wood wastes NHAZ - Lower amounts in 2014 than in 2012 due to change in national law that now classifies it as by-product.

D1-D5-D12 - Mineral waste from construction and demolition NHAZ - Lower amounts in 2014 than in 2012 due to change in waste treatment operation from D1 to R5.

D1-D5-D12 - Sorting residues NHAZ - Higher amount in 2014 than in 2012 due to waste generated from mechanical treatment of mixed municipal waste (LoW 19 12 12).

R2-R11 - Metal wastes, mixed ferrous and non-ferrous NHAZ - Lower amounts in 2014 than in 2012. In 2012 a large number of new purchasing stations for metal waste opened therefore the biggest amounts of metal waste (LoW 20 01 40) brought by citizens were reported. In 2014 citizens have brought lower amounts of this type of waste into the purchasing stations.

R2-R11 - Plastic wastes NHAZ - Higher amount in 2014 than in 2012 due to recovery of waste that was temporary stored in 2013. Additionally more imports of waste destined to recycling were reported.

Backfilling - Soils NHAZ - Higher amount in 2014 than in 2012. Data are correct and reported according to information obtained by landfill operators.

D1-D5-D12 - Common sludges NHAZ - Higher amount in 2014 than in 2012 due to sludges from treatment of urban waste water (LoW 19 08 05) which are from 2013 considered as landfilled after several years of temporary storage at the location of waste water treatment plant.

D1-D5-D12 - Dredging spoils NHAZ - Lower amounts in 2014 than in 2012 due to change in waste treatment operation from D1 to R5.

R2-R11 - Paper and cardboard wastes NHAZ - Higher amount in 2014 than in 2012 due to increased generation and imports of waste destined for recycling.

R2-R11 - Vegetal wastes NHAZ - Higher amount in 2014 than in 2012 due to activation of new biogas plants.

R2-R11 - Mixed and undifferentiated materials NHAZ - Higher amount in 2014 than in 2012 due to more reported of waste import (LoW 03 03 08) by one paper mill.

R2-R11 - Household and similar wastes NHAZ - Higher amount in 2014 than in 2012 because one mechanical biological treatment (MBT) plant started to work in 2014.

R2-R1 - Discarded vehicles HAZ - Lower amounts in 2014 than in 2012. Data were checked with the waste treatment facilities and they are correct.

R2-R11 - Soils NHAZ - Higher amount in 2014 than in 2012 due to change in waste treatment operation from D1 to R5.

Other disposal - Mixed and undifferentiated materials NHAZ - Higher amount in 2014 than in 2012 due to increased amounts of waste treated by D3 after changes in waste handling process (new installed pre-treatment device by one waste treatment operator).

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 exports significant amounts of this waste. Data for non-hazardous waste are in default ratio.

3. implausible combinations treatment operation / waste categories

Performed validation rule showed that in 2014 there weren't implausible combinations for treatment operation / waste categories.

4. treated amounts vs. treatment capacities (incineration)

Performed validation rule showed that in 2014 treated amounts were below available capacities for energy recovery (R1) and waste incineration (D10).

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 the Environmental and Nature Protection, 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

Data on Mining waste

Most of the data on mining activities are managed by Ministry of Economy which is the central state administration body competent for mining in Croatia. The Ordinance no. 128/2008 on the Management of Waste Resulting from the Exploration and Excavation of Mineral Resources defines CAEN as responsible body for maintaining database and records of extractive waste management facilities/installations.

Facilities/ installations belonging to mining activities do not report data on materials which stay on the location of excavation. For this reason, no data is currently available on this category of waste in Croatia but this situation will change in the near future as the CAEN is currently carrying out the project on data improvement.

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 (year 2017) to carry out study for the determination, calculation and estimation the waste amounts generated in agricultural sector.

NACE F

In Croatia, the generators of construction waste are often the construction companies but sometimes the generator is the future building owner, who doesn't report data on construction waste. Therefore part of the data on construction and demolition waste is still missing. At the moment CAEN is carrying out the project on the estimation of C&D waste quantities from activity NACE F. The end of the project is foreseen for March 2017.

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

One incineration plant for animal by –products placed in HR04 Kontinentalna Hrvatska didn't report data neither to the Ministry of agriculture neither to the CAEN. It is about negligible amounts and treatment capacity.

2 Accuracy

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 2014 are mostly based on the data reported by waste generators, 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 CAEN. The deadline for reporting data for 2014 was 1st of March 2015. Until 15th of June 2015, 20 county offices and the office of the City of Zagreb in cooperation with the competent inspection should ensure the checking of data in terms of their completeness, consistency and credibility. Unfortunately, deadlines were exceeded both by companies and by county offices. Data verification by some county office was done until the end of October.

After the data verification made by counties was finished, the CAEN provided final check of the verified data by the end of the December 2015.

In January 2016, data reported into the EPR database were converted by special application to the format requested by WStatR. When data conversion was done, CAEN started with data preparation for the WStatR.

Data on animal by-products were additionally requested from the Ministry of agriculture which delivered data in May 2016.

After the compilation of datasets 1 and 2 was done (at the end of May), before delivery to the Eurostat, CAEN 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 *Waste Management Permits Register (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 *Ordinance on animal by-products not intended for human consumption (OG No 87/09)*, *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 diegstion 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 part of the data were extracted from WMP database.

Regarding data on rest capacity of landfills, according to the Act on Sustainable Waste Management, the landfill operator should submit data into database Central Management System for the Data on Landfills of Waste maintained by Agency. Data should be submitted twice a year within 30 days of the expiry of each half-year period. Therefore, data for 2014 were reported by the end of the January 2015. Validation of reported data was performed during February 2015.

4 Accessibility and clarity

The data and information on waste are disseminated primarily on website of the Croatian Agency for the Environment and Nature (**http://www.azo.hr/English**). The web page provides access to databases that contain reported and collected data on waste, publications and reports (**http://www.azo.hr/Izvjesca14**; **http://www.azo.hr/IzvjescaROO01**), indicators (**http://www.azo.hr/Pokazatelji11**) and public browsers (**http://roo-pregledni k.azo.hr/**, **http://hnproo.azo.hr/Home.aspx**).

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

Regarding clarity, CAEN publishes on its websites legislation, manuals and instructions for companies, questionnaires etc (**http://www.azo.hr/Otpad01**).

Additionally, data and information are disseminated by meetings and workshops. Also data and information are available on request by phone and info mail (info@azo.hr) or Information Access Request in accordance with the Act on the Right of Access to Information (OG No. 25/13) 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 CAEN).

Data collected by CBS up to 2010 and data collected by CAEN 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 WSR were used also for the preparation of environmental indicators and national reports.

7 Burden on respondents

There are about 8000 PL-PPO forms (from 4400 companies) and 330 PL-OPKO forms (from 280 companies) filled for reporting year 2014. These forms are prescribed by the Ordinance on EPR. 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, CAEN asks companies for additional information. There are also manuals, instructions, FAQ and examples of filled forms available on CAEN webpage.