ARGUS

Validation and Publication of Waste Statistics

Report on the in-depth validation of WStatR data

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1 Introduction

ARGUS conducted an in depth validation of the Waste Statistics Regulation (WStatR) data 2008. The main aim of this analysis was to determine the degree of comparability of data between countries and, for the first time, to analyse the consistency of time series since 2004. The present document compiles the main outcome of the validation for each country for reporting year 2008, together with the questions and answers received from the countries (Annex). This report covers all correspondence received by 18th of July 2011. Table 1 provides an overview on the requests sent to the countries, the answers received and the actions taken (*or foreseen*).

Table 1 Overview on the status of the in-depth validation by countries, 18th of August 2011

Country	2008 data in-depth validation, dates of transmission				
	Questions sent	Answers received	Follow-up-questions sent	Answers received	Actions taken / *actions foreseen*
BE	23.03.2011	28.04.2011	17.05.2011	06.06.2011	new data delivered
BG	23.03.2011	28.04.2011	11.05.2011	01.06.2011	Retrospective changes
CZ	18.03.2011	08.04.2011	11.05.2011	27.05.2011	*Changes announced*
DK	30.03.2011	27.06.2011	07.07.2011	No reply	
DE	22.03.2011	22.07.2011	No		
EE	01.04.2011	28.04.2011	11.05.2011	26.05.2011	*Changes announced*
IE	no sufficient data delivered				
GR	29.03.2011	28.04.2011	13.05.2011	No reply	
ES	24.03.2011	12.05.2011	18.05.2011	26.05.2011	*Changes announced*
FR	23.03.2011	14.04.2011	04.05.2011	06.06.2011	Retrospective changes
IT	24.03.2011	28.04.2011	No		
CY	01.04.2011	28.04.2011	13.05.2011	07.06.2011	*Changes announced*
LV	29.03.2011	28.04.2011	13.05.2011	No reply	
LT	30.03.2011	04.05.2011	13.05.2011	27.05.2011	Retrospective changes & new data delivered
LU	31.03.2011	21.06.2011	22.06.2011	No reply	*Changes 2006 announced*
HU	28.03.2011	18.05.2011	No		Retrospective changes & new data delivered
MT	31.03.2011	28.04.2011	No		Retrospective changes & new data delivered
NL	25.03.2011	15.04.2011	12.05.2011	10.06.2011	Retrospective changes & new data delivered
AT	23.03.2011	14.06.2011	16.06.2011	24.06.2011	*Changes 2008 announced*
PL	22.03.2011	26.04.2011	04. & 23.05.2011	16.05.2011 1)	new data delivered
PT	18.03.2011	29.07.2011	No		
RO	25.03.2011	10.06.2011	No		Retrospective changes & new data delivered
SI	29.03.2011	28.04.2011	11.05.2011	20.05.2011	*Corrections announced*
SK	30.03.2011	29.04.2011	13.05. & 21.06.2011	17.06.2011 1)	
FI	29.03.2011	No reply			
SE	23.03.2011	14.04.2011	17.05.2011	27.05.2011	Retrospective changes
UK	18.03.2011	28.04.2011	12.05.2011	27.05.2011	Retrospective changes
HR	31.03.2011	07.04.2011	No		
MK	31.03.2011	29.04.2011	No		
TR	28.03.2011	18.07.2011	19.07.2011	04.08.2011	new data delivered
IS	no data delivered				
LI	31.03.2011	28.06.2011	No		
NO	28.03.2011	28.06.2011	No		Retrospective changes & new data delivered
TOTAL	**31**	**30**	**20**	**16**	**20**

1) No reply on second follow-up request.

Overall, requests were sent to all 31 countries which provided sufficient data. Only one country of these 31 did not send any reply by the time this report was drafted, in six cases no reply on follow-up-questions was provided. When the request sheets were only partially answered this is marked in the Annexes to this report. The response rates are very satisfactory and much higher than in previous validations.

2 Validation approach

The validation approach consisted in a continuation and further development of the previous validation methodology as applied for the data of reference years 2004 and 2006. In addition, a documentation of previous country consultations, including the quick evaluations of Eurostat 2004, 2006 and 2008 was compiled. Overall the validation has consisted of the following steps:

- **Step 1**: Collection and structuring of available country information, preparation of a database for the identification of possible errors (documentation and preparation)
- **Step 2**: Identification of possible errors based on the methodology set out in the validation plan
- **Step 3**: Drafting of requests for clarification (Question lists sent to countries)
- **Step 4**: Assessment of countries' replies / documentation / follow-up

In the following, the 4 steps are described in detail.

2.1 Step 1 – documentation and preparation

Prior to the identification of possible errors, a considerable volume of available information was collected and a database for the identification of possible errors was prepared. The following sources were checked for country specific information, with the mentioned aspects covered:

- Screening of quality reports 2004, 2006, 2008 on aspects affecting the comparability across countries and over time, particularly:
  - changes of data collection and methodology
  - description of coverage problems
  - description of applied classifications
- Eurostat evaluations 2006 and 2008:
  - questions and answers by data set and cell identifiers (NACE, EWC-Stat, Treatment operation)
- In-depth validations 2004 and 2006:
  - questions and answers by data set and cell identifiers (NACE, EWC-Stat, Treatment operation)

The information on the Eurostat evaluations and the In-depth validations for the underlined years was made available in database format. Hereby not the text of the questions and answers was recorded itself, but instead a summary of the possible error (type of check, type of possible error [low, high, rank of waste], affected cell) and the main conclusion from the answer (was the value an error and what reason for the particularity was provided).

The remaining information was collected and summarised in Excel format so that it can be imported into a database later, where appropriate. For the in-depth validation 2008, a new MS-Access database was prepared by creation of the following tables and definition of their relationships (Figure 1):

1. tables containing the code lists for countries, waste categories, treatment operations and NACE rev. 2 activities (plus households)
2. tables for the reported WStatR data sets on the basis of the formats from Eurobase and MDT (i.e. waste_gener, waste_treatm, waste_regio, waste_popser)
3. tables for calculation of indicators (economic data on gross value and employees, population data)
4. tables for the documentation of the validation results.

Figure 1 shows the resulting database model, with the numbers in the picture referring to the tables listed above.

The tables for the documentation of the validation results already include the core information from the in-depth validations 2004 and 2006. However, in order to link this information with the 2008 data formats, several code changes needed to be performed, in particular affecting the conversion of NACE Rev. 1.1 into NACE Rev. 2 codes.

After implementation of the database tables, queries were created to perform the required calculations and filtrations needed for the identification of possible errors as described in the following section.

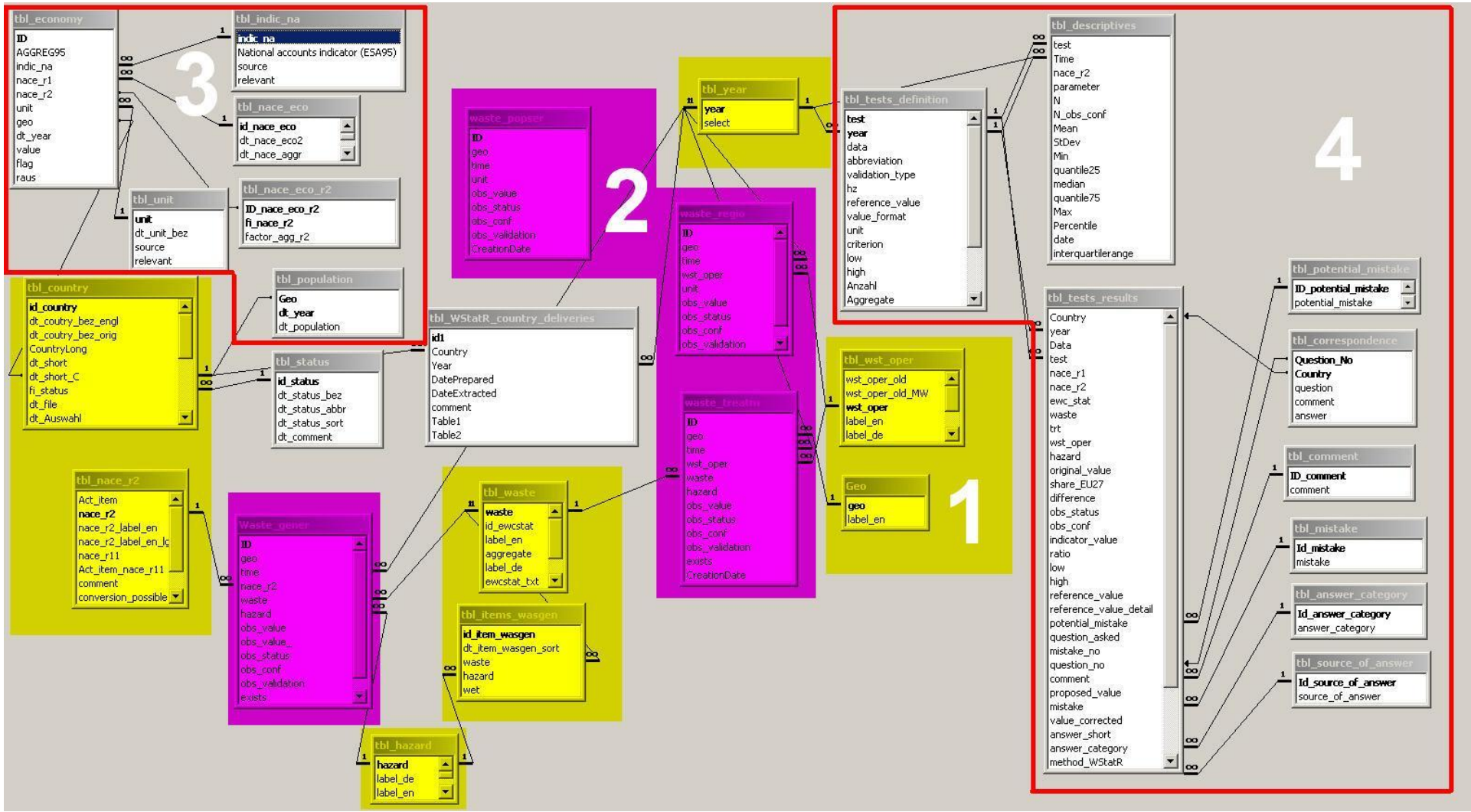

Figure 1 Model of the database used for the validation and its documentation.

2.2 Step 2 - Identification of possible errors - methodology

The results of the previous validations (reference years 2004 and 2006) were analysed and assessed. As a result of that assessment, the previous checks were adapted and new checks were introduced. Table 2 contains a summary of the checks applied for the identification of possible errors in the data 2008. The table shows the newly introduced checks in green shading and adapted existing checks in yellow shading. Check types not shaded remained unchanged.

Table 2 Types of checks to be applied for WStatR data 2008

group	type of check (abbreviation)	validation type	hz	reference value	value format	criterion	threshold low	threshold high
visual checks		various						
waste generation	value added	Comparison to other countries	tt	interquartile range of all countries	indicator value added[1)]	factor	-0,6	1,5
	employees		tt		indicator employees[1)]		-0,6	1,5
	population		tt		indicator population[2)]		-0,6	1,5
	value added	Comparison to previous value	tt	previous value	indicator value added[1)]	factor	0,5	2,0
	employees		tt		indicator employees[1)]		0,5	2,0
	population		tt		indicator population[2)]		0,5	2,0
	HZ share	Comparison to other countries	hz	interquantile range of all countries	share	factor	-0,6	1,5
	HZ share	Comparison to previous value	hz	previous value	share		0,5	2,0
	value added	Comparison to other countries	hz	interquantile range of all countries	indicator value added[1)]	factor	-0,6	1,5
	employees		hz		indicator employees[1)]		-0,6	1,5
	population		hz		indicator population[2)]		-0,6	1,5
	value added	Comparison to previous value	hz	previous value	indicator value added[1)]	factor	0,5	2,0
	employees		hz		indicator employees[1)]		0,5	2,0
	population		hz		indicator population[2)]		0,5	2,0
	misclass. HZ	Misclassification of waste types	hz	only case of all countries	original	Rank of waste	4[3)]	n.a.
	misclass. NH		nh					
waste treatment	trt/gen NH	Comparison to generation	nh	trt share from gen	share	factor	0,8	1,15
	trt/gen HZ		hz				0,8	1,15
	Basel1 HZ	Comparison to generation under use of Basel data	hz	trt share from gen+Imp-Exp			0,8	1,15
	Basel2 HZ		hz	trt share from genB+Imp-Exp			0,8	1,15
	trt/trt-prev[4)]	Comparison to previous value	tt	trt share from trt-previous			0,8	1,2
	trt/trt-cap[5)]	Comparison to treatment capacity	tt	trt share from trt-cap			n.a.	1,0
cross-checks	Packaging[6)]	Ratio "Packaging recovered / total material[6)] recovered"			share	factor	[6)]	1,0
	WEEE	Ratio "ELV total / discarded vehicles generated"					0,5	1,0
	ELV	Ratio "WEEE collected / discarded equipment generated"					0,5	1,0
	gen/genB	Ratio hz waste generation WSR / WStatR					0,8	1,2

Abbreviations:

gen = waste generated
genB = waste generated according to Basel convention
hz = hazardous
+Imp-Exp = plus imports - exports according to Basel convention
trt = waste treated
trt-cap = treatment capacities
trt-prev = waste treated previous reporting
tt = total
Packaging = Packaging Directive (94/62/EC)
WEEE = Waste electrical & electronic equipment (Dir. 2002/96/EC)
ELV = End-of-life vehicles (Directive 2000/53/EC)
new types of checks
check adapted

Notes:

1) Basis for the comparison were data on structural business statistics 2008 and the national account statistics 2004, 2006 and 2008 with the parameters value added at current prices and total employment, respectively. Applied for 19 NACE categories plus the total for all activites encl. households.

2) Applied for 19 NACE categories and households plus totals for all activites (excl. and incl. households)

3) Means that if waste type is identified among the highest three (rank 1-3), only for one country, that the criterion for a possible error will be violated.

4) For total amount and all five treatment operations

5) Only for treatment operations incineration without energy recovery and energy recovery

6) Applied for the materials Glass, Paper/cardboard, Plastics, Wood, Metal, lower limit varied depending on the material:
Glass: 0.8, paper and cardboard, plastic: 0.5, wood: 0.2, metals: 0.05.

It can be seen that most of the existing types of checks were mostly maintained without changes as the results of the review proved their effectiveness. The following changes were implemented:

- The comparisons based on other production proxies were replaced by a population related indicator for three reasons:
    1. The denominator population allows for the inclusion of the activity households so far not testable by the denominators value added or employees.
    2. The relation to population has come into a new focus since the introduction of the new population based sustainable development indicators.
    3. Other proxies were not very effective except for the percentage of electricity produced from solid combustibles (NACE D); this check was conducted visually.

- Removal of the treatment category recovery from the check on treated amounts versus treatment capacities, as these data had shown limited validity and the reporting consequently ceased in 2008.

As the green shaded cells in Table 2 indicate, almost half of all checks conducted were newly introduced check types. The new check types may be summarised as follows:

- Three cross-country comparisons based on production proxies and population for hazardous waste
- Three intra-country comparisons with previous values based on production proxies and population for hazardous waste
- One intra-country comparison with previous values for the total amount treated as well as the amounts treated by the five treatment operations
- Four cross-checks with data from compliance reporting for waste types of particular interest, namely,
    1. Comparison of reported Packaging waste (Directive 94/62/EC) recycled with five typical recyclable materials recovered acc. to WStatR (EWC-Stat 06 (Metallic wastes), 07.1 (Glass wastes), 07.2 (Paper and cardboard wastes), 07.4 (Plastic wastes), 07.5 (Wood wastes))
    2. Comparison of reported Waste electrical and electronic equipment (WEEE) (2002/96/EC) with discarded equipment generated (08 excl. 08.1, 08.41)
    3. Comparison of reported End-of-life vehicles (ELV) (2000/53/EC) with discarded vehicles generated (EWC-Stat 08.1)
    4. Comparison of hazardous waste generation according to the Waste Shipment Regulation (WSR) with that reported by WStatR

In addition, several visual checks were conducted for the following reasons:

Firstly, it often happens that general methodological issues induce particularities which affect a large part of the whole countries' dataset (e.g. hazardous waste as a whole or a certain waste category) and thus cause many possible errors when checked in detail (e.g. based on economic activity). To avoid a too large number of detailed questions of similar nature, it was preferred to identify these cases and address these issues in a more general, summarising way.

Secondly, the visual checks were conducted to overcome the problem that the ratio related checks for intra-country comparisons often identify possible errors related to figures which are not very relevant in terms of absolute figures, as the ratio of two very low values might be lower or higher than the thresholds without being really unrealistic.

Finally, checks based on economic activity are only one way looking at the data set. Therefore, the test category ‘visual checks’ summarises several non-standardised analyses of the data aiming at:

- the understanding and interpretation of the indicators ‘non-mineral waste generated’ and ‘hazardous waste generated’;
- the complementation of the sector-oriented checks by a waste category oriented analysis.

The visual checks include especially the analysis of the data with regard to the following questions:

- Which waste categories are responsible for the sectoral observations identified by the standardised checks described above?
- Which countries or sectors are responsible for major changes of waste categories?

Most of the checks shown in Table 2 were implemented in a standardised way in a MS-Access database. This approach was useful to ensure rapid updating of the dataset in case of additional deliveries or ad-hoc corrections by the countries. In case the checks were conducted in Excel, as for

instance the comparisons with the data on Waste Shipment, the data were appropriately linked to the database.

To understand the rationale of the comparisons with other countries on the basis of interquartile ranges of all countries (see Table 2), Figure 2 illustrates the distribution of the indicator "hazardous waste total/gross value added" within the different sectors according to NACE Rev. 2. It is an optical illustration of the calculations performed in the database in order to identify outliers, i.e. values which deviate from the upper or lower quartiles by more than 1.5 interquartile ranges.

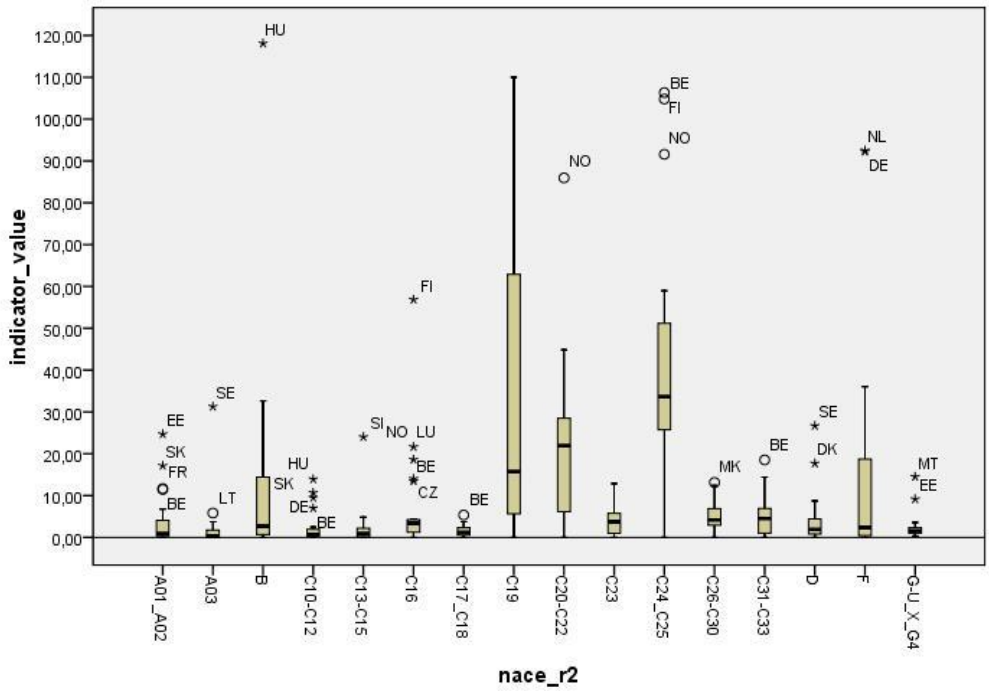

Figure 2 Example for possible errors of the comparisons across countries – identification of outliers for indicator "hazardous waste total/gross value added": distribution by NACE

In the example shown in Figure 2, the calculated indicators for all countries are shown as Box-and-Whisker-plots for each NACE sector. As the name suggests, these plots consist of a box with a band near the middle of the box being the 50th percentile (the median). The boxes represent the "inner" 50 % of all available country values of the indicator, when the values are sorted in ascending order. The bottom and top of the box represent the 25th and 75th percentile (the lower and upper quartiles, respectively). The lines above and/or below the box are called Whiskers, the ends of which represent the highest and lowest non-outliers. The values marked with an asterisk represent the outliers, the associated abbreviations refer to the reporting country.

The database queries were designed to calculate the indicators required and from these, the core values of the distribution by NACE mentioned above, i.e. median, lower and upper quartiles and interquartile range. These values were stored in a separate table ("tbl_descriptives", see area 4, Figure 1) for each indicator type (value added, employees, population), NACE activity and cell affected (overall total, total hazardous waste or share of hazardous waste). In another query, the lower and upper thresholds were calculated from the values stored in tbl_descriptives and compared to the indicators on a country basis. Values below or above the calculated thresholds were filtered as outliers and transferred to yet another table ("tbl_test_results", see again area 4, Figure 1). In this table all other possible errors from the remaining checks were added. Note that the lower limit was reduced to 0.6 interquartile ranges for the reason that the core area of the distribution of the values is often close to zero, so that almost no regular outliers were detected when applying the (regular) criterion of 1.5 interquartile ranges (no outliers in Figure 2).

2.3 Step 3 - drafting of requests for clarification

The requests for clarification were drafted as follows:

§ Compilation of a list with all possible errors: on the basis of the methods described above (section 2.2), the possible errors identified by means of the database were combined with some the findings of the checks performed in Excel files (including the visual checks) for each country and sorted by NACE activity and waste category and treatment operation.

§ Assessment of the relevance of each questionable entry: The relevance of each value was checked, mostly by optical control using comparative charts and tables (see Annex 3-01 of the interim report) which illustrate the share from the respective national total, from the EU27 total, the absolute and relative changes compared to previous values etc.. Each entry was marked whether a question is required or not, leading to a reduction of the lists to the relevant figures only.

§ Check of the documentation: The documentation (section 2.1) of the previous validations (including Eurostat evaluations) and the relevant sections from the quality report were assessed for possible reasons for the observed particularities, leading to a reduction of the lists to the unresolved issues only.

§ Compilation of request for clarification: In this final step, specific questions to the countries were drafted on the basis of the relevant findings on possible errors for which no reason could be found in the documentation. Usually the questions were a summary of several possible errors observed. The question lists are structured according to the three groups of checks as follows:

- Questions on waste generation by NACE, including the tests on possible misclassifications (see Annex 3-03 of the interim report) and the visual checks,
- Questions on waste treatment, and
- Questions on cross-checks.

As a result, the question lists were send to the countries and the information was combined in the database, in particular covering the following issues:

- cell reference of the value tested (NACE, EWCSTAT, data set, hazardousness and type of checks]),
- type of possible error (low, high, rank of waste [only for check on misclassifications]),
- question number, under which the issue was addressed in the requests for clarification forms sent to the countries.

In the following section the assessment of countries' replies and their documentation is described.

2.4 Step 4 - Assessment of countries' replies / documentation / follow-up

For each type of check described and listed above (see section 2.2, Table 2), the following core information was recorded together with the answers by the countries on the request for clarification:

- question number; for linking the information from the replies with those on the cell references and potential errors collected in step 3 (see section 2.3), and
- an assessment of the answer.

In order to collect the required data for this assessment, the feedback from the countries was reviewed for statements on the following two main questions:

1. Was, from the countries perspective, the possible error a real data error or not?
2. What was the reason for the deviation that lead to the identification of the possible error?

Regarding the reason, it turned out that differences among countries and across years may be due to:

1. data entry mistakes that can be changed immediately;
2. misallocation of the economic activities;
3. misallocation of the waste types;
4. methodological reasons, i.e. differences in the way data are collected;
5. changes in legislation
6. differences of the economic activities (structures) among countries:
    - e.g. different sizes of the economic sectors
    - e.g. different activities within NACE sectors (including different waste management).

The reasons stated by the countries were categorised according to the 6 main reasons listed above (plus additional options for non-respondents and unclear statements). In the following, the assessment of country information regarding the two questions summarised with typical examples. Although question one (real error or not?) appears straight forward, the countries' comments often contained no clear statements on that issue. Thus, when the countries comments contained no clear statement that the possible error was a mistake, additional questions were asked. It was, for instance, regarded as a clear statement, when the country acknowledged the problem and announced at least to take measures in the next data collection to avoid the problem, even if it was rejected to correct the value in question. Table 3 shows examples of reasons observed (third column) in combination with the answer on the first question (first column), the categories these statements were classified with (second column) and the finally the assessment whether a follow-up is required or not (fourth column).

Table 3: Typical reasons for possible errors as stated by the countries in the course of the in-depth validation of WStatR data 2004 to 2008 and the applied categories for their assessment

Error?	category	typical reasons for particularities stated by the countries	Follow-up?
yes	data entry mistake	• typing error • value entered into wrong cell • 1000-error • conversion/calculation error	yes/no[1)]
yes	methodological reason[2)]	• sampling errors • significant coverage gaps • waste or NACE category over/underestimated • incomplete/insufficient registers • extrapolation wrong or missing • important enterprise not drawn	yes/no[1)]
yes	misallocation economic activity	• allocation to wrong NACE category, e.g. allocation to services instead of waste management	yes/no[1)]
yes	misallocation waste type	• wrong waste classification (often on LoW level)	yes/no[1)]
no	economic activity different (different econ. structure)	• different sizes of the economic sectors (e.g. mining in BG & RO, hz. wastes from energy sector in EE, timber industry in FI) • different activities within NACE sectors (e.g. chemical waste from food industry laboratories in DE, tree logging activities in construction sector in ES)	no
no	change in legislation	• a tax was introduced for certain waste types which caused the corresponding amounts to decrease • new law requires to check soil pollution prior to selling land which leads to increased remediation activities and thus higher amounts of waste associated with these	no
no	methodological reason[2)]	• different coverage by economic activities • different allocation method for economic activity • different coverage by waste types regarding general/hazardous waste definition (e.g. legal changes regarding waste definition or hazardous waste definition) • improvement of the methodology (correction of an error identified for 2004 data by changing the method in 2006 causing a possible error in the intra-country check, better coverage 2006 compared to 2004) • Different data sources WStatR induced: • pre-treatment (dismantling, mechanical-biological treatment, chemical physical treatment) • import/export • capacity of recovery not quantifiable (land shaping, re-use, final recovery often in industrial facilities)	no
not asked	n.a.	no question was asked in the course of the in-depth validation, because the value with a potential mistake was realistic or not relevant in terms of quantity	no
not answered	n.a.	a question was asked in the course of the in-depth validation, but the country did not provide an answer at all	yes
unknown	unknown	a question was asked in the course of the in-depth validation and the country provided some statements but these contained no answer to the question or the country stated not to know the reason	yes/no[1)]

Notes:

1) Requirement of follow-up was assessed on an individual basis considering the quantitative relevance of the value in relation to the additional burden to the respondents for data correction and/or reply on further follow-up requests.

2) Some methodological reasons are an indication of an error, others not, i.e. they describe a particularity of the methodology applied for data collection, e.g. changes over time.

When the answer revealed that a follow-up is required, follow-up questions were added to the existing requests for clarification sheets. Typical follow-up procedures included the following action:

- the compilation of further questions when the statements of the countries did not provide answers to the initial questions sent,
- the compilation of further questions when the statements of the countries contained an answer but require further clarification in order to make a more precise assessment,
- the transmission of reminders to non-participants of the consultation or to those countries who did not answer all questions,

- the reply on questions raised by the countries in the course of the country consultations, particularly when they referred to
  - the question whether and by whom the value should be corrected,
  - the need for further explanations of the particularities observed,
  - the requirement for further guidance on the methodology of the WStatR,
- the transmission of reminders to those countries which acknowledged the observed errors but did not come up with a proposal for a procedure to transmit their corrected data.

The sheets were then send back to the countries for further requests. All cases which could not be completely resolved during the project period are marked in red font in the request sheets (see file "*Annex1 Validation overview by country.pdf*") and in yellow shading in the overview tables (see file "*Annex2 Validation overview by country.pdf*").

Apart from the documentation of all identified potential mistakes, their assessment and the first steps of a sound follow-up described above, validation result sheets were compiled for each country in order to summarise the most important information from the requests to the countries as well as other sources such as (former or actual) quality reports, previous in depth-validations or the quick evaluations conducted by Eurostat.

In the following chapter the validation results are presented for each country. In the two Annexes mentioned above, all questions and, if available, answers are shown. In addition, overview tables for each group of checks (waste generation, waste treatment, cross-checks) show the potential mistakes observed, in which cases a question was asked, whether the assessment of the replies solved the case or whether a follow-up is required. The overview tables can be updated in case of further replies.

The summary sheets for each country (see chapter 3) are structured as follows:

Structural characteristics (economy, geography, ..)

- Description of specificities with regard the economic structure that show regularly up in data validation (EE: oil shale; FI: strong wood industry; …)

Observations

- Description of signification observations from data validation, i.e. inconsistent data or peculiar data in comparison with other countries, other reference years, and other reporting obligations, or with regard to internal consistence.

Methodological and quality deficits

- Description of the main identified quality problems and of aspects / characteristics that may result in quality problems
- Examples:
  - Allocation to NACE on the basis of LoW-codes (DE,...)
  - Sample survey on municipalities (CZ)
  - No extrapolation of treated quantities (CZ)
  - Use of deviating / incompatible classifications (NACE aggregates in DK, ÖNORM in AT)

Breaks in time series

- List of significant breaks, if possible with explanations

Further action required

- Follow-up to validation questions required?
- Correction of wrong figures necessary?

3 Validation results by country

3.1 Belgium

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (32%), NACE E38/G46.77 (24 %), NACE C (21%)
  - Hazardous waste: NACE F (59%), NACE C24-C25 (13%), NACE G-U (9%)
- The difficult cooperation between NSI and OVAM (Flemish region) hampers the production of high quality data on the national level.

Observations

- BE reports a high **hazardous waste total** and a particularly high hazardous waste generation in **NACE F**. The hazardous waste total in NACE F is the highest amount of all countries when related to inhabitants. The hazardous waste total is the third highest after EE and BG. (Validation 2008)
- The total amount of contaminated soils and polluted dredging spoils (**EWC-STAT 12.6**) has increased by the factor 6 from 2006 to 2008 and is very high compared to other countries. A possible reason for the increase is a new legislation that requires sellers of land to prove that the soil is not contaminated and to sanitise the soil if necessary. (Validation 2008).
- For 2008, very high amounts were reported for sector **NACE 38**, mainly for the **total waste** but also for **hazardous waste**. BE indicates methodological problems in this sector. The amounts were even much higher in 2006. The situation in sector **NACE G46.77** is similar although on a lower level. (Validation 2008)
- High **hazardous waste** arising in **NACE C24-C25** (Manufacture of basic metals and fabricated metal products), mainly due to a high amount of combustion waste from the Flemish region. (Validation 2008)
- The amount of **total waste treated** is much lower than the quantity of **total waste generated** in 2008 but also in the years before. This is valid for non-hazardous and for hazardous waste and could not be explained so far.

Methodological and quality deficits

- Belgium has no consistent methodology for the whole country but has to use a patchwork of data from the three regions and supplement this with data collected by the NSI. Methods and data coverage are different in the regions. Consolidation of data might lead to double-counting of waste from local units of companies with national (trans-regional) activities, mainly in the sector construction. (QR validation 2004)
- In 2004, data on the treatment category **'recovery other than energy recovery'** were available only for the waste category totals. The breakdown into hazardous/non-hazardous is confidential. According to QR 2004, the Walloon region failed to report the recovery of non-hazardous wastes.
- For the reference year 2004, BE declared a lot of cells on **generation** and on **treatment** as confidential

Breaks in time series

- Steep increase of the (already high amount of) **total hazardous waste** from 2006 to 2008 by 44 % (171 kg/capita), presumably through new legislation on contaminated sites (see observations above)

Further action required

- **Hazardous waste** data for sector **NACE F** are being checked and might be revised. The same applies to some further sectors that are less important in terms of quantity.

3.2 Bulgaria

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE B (94%), NACE D (3 %), NACE C (1%)
  - Hazardous waste: NACE B (94%), NACE C24-C25 (5%), NACE C19 (0.5%)
- Bulgaria extracts coal and lignite, metallic minerals (e.g. iron, manganese, copper, chromium, zinc) and non-metallic minerals, mostly by open-pit excavation. The mineral wastes from the Bulgarian mining industry amounted in 2008 to 267 million tonnes or 93 % of the Bulgarian national total and accounted for about 10% of the EU-27 total. About 12 million tonnes of hazardous waste (12% of the EU-27 total) are tailings from copper ore processing generated by one company.
- It is unclear to which extent the high amounts from the mining sector are due to extremely waste intensive mining activities (i.e. the high share of open pit excavation) or due to broader data coverage.

Observations

- In **NACE C24-C25** (Manufacture of basic metals and fabricated metal products), BG reports a high quantity of **hazardous waste** and the highest share of hazardous waste related to the sector total of all countries.
- The **hazard waste** total in **NACE F** is very low compared to other countries.
- High fluctuation of the generation of combustion waste due to fluctuations in sector **NACE D** and to the first-time appearance in **NACE B** of 230 kg/capita of combustion waste in 2008.
- Fluctuations of figures for **energy recovery and incineration** seem to be due to classification problems with regard to R1 and D10. BG claims that the quantities are properly attributed as of 2007.

Methodological and quality deficits

- Data on **hazardous waste** are provided by the Executive Environmental Agency. It seems that questions concerning hazardous waste are not forwarded and discussed with the ExEA. As a result, answers concerning hazardous waste (which were the most frequent validation questions) are mostly very general and not really helpful.
- Data on generation of **discarded equipment** and **discarded vehicles** fluctuate considerably and are not consistent with the data reported according to the WEEE- and the ELV-Directive. BG points out that WEEE and ELV generated by the population are not covered by WStatR data.

Breaks in time series

- n.a.

Further action required

- Next data delivery: Check whether promised improvements regarding the data on discarded vehicles, discarded equipment and waste shipment regulation are implemented.

3.3 Czech Republic

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (42%), NACE C (21 %), HH (13%)
  - Hazardous waste: NACE E38/G46.77 (26%), C24-C25 (21%), NACE F (12%)
- CZ extracts considerable amounts of coal and lignite and ranks fifth in the EU 27 with regard to the number of employees in sector **NACE B**. Compared to the economic importance of the mining sector, the generated total in NACE B has always been very low and, in addition, is sharply decreasing since 2004. CZ states that "the reason (for the low amounts) might be that non-hazardous waste does not leave the mining place and then it is not considered waste." (Validation 2008). It is not clear whether this is an assumption or a fact. Due to the low sectoral total in NACE B the share of hazardous waste in 2008 was the 2nd highest of all countries after Norway.
- The collaboration between the Czech Statistical Office (CZSO) and the Ministry of the Environment (MoE) seems to be very difficult which hampers the quality and the consistency of waste statistics.

Observations

- In **NACE B** (Mining and quarrying), the total waste decreased by 65% from 2006 to 2008. "The main reason consists in decrease of mineral waste generated by one important enterprise. Between 2006 and 2008 the enterprise reduced generation of ash from thermal processes." The respective data are confidential. (Validation 2008)
- **Hazardous waste** generation reported under the WStatR is about 26% lower than the generation reported under the WSR. The reasons are not known.
- Data validation revealed several significant changes of sectoral totals that were explained by wrong attribution to NACE codes or real changes of only one company. Both cases indicate that the impact of individual companies on the sectoral total is quite high. This could have methodological reasons.
- WStatR data on **glass recycling** have been decreasing significantly since 2004 and are (maybe as a result) much lower than the amounts of glass waste recycled according to the **Packaging Directive**. Neither the reasons for the decrease nor for the inconsistency with the packaging data are known.
- Data on **discarded equipment** and **discarded vehicles** are not consistent with the data reported under the WEEE- and ELV-Directive, i.e. the WStatR figures are clearly lower than the data from the other reporting obligations. The assumed reason is that waste from natural persons that is not collected as municipal waste but delivered directly to treatment facilities (as is usually the case for ELV) is not covered by the WStatR. (Validation 2008).

Methodological and quality deficits

- Undercoverage of data on waste treatment: CZ collects data on waste generation and treatment by the same survey using a sampling approach based on the Business Register (which is documented in detail in Annex II of the QR). As a result, a considerable number of treatment facilities (incl. incineration facilities and landfills) is not covered by the survey as shown in table 10, page 19 of the QR. The data are not grossed up.
  As regard to landfilling, mainly small landfills are excluded; their share in the landfilled total is estimated to about 3 %. For other treatment facilities the undercoverage is not known. (Validation 2008)
- CZ uses national **waste treatment codes** (N-codes) in addition to the **European R and D codes**. In the QR 2008 it is said that the "N-codes used for primary data collection are transferred to R- and D-codes (2150/2002/EC)". This does not apply for treatment code N5 store balance to which 3.8 million tonnes of waste were attributed in 2008. Altogether, the impact of the national codes on the data is not completely clear. (Validation 2008).

- **Treatment operation D2 'Land treatment'** is not covered because there exists no respective reporting obligation. The explanations in the quality report indicate that this remark actually refers (also) to the operation R10, e.g. to the use of sewage sludge for agricultural purposes and similar recovery operations (see quality report, table 9).
- The Czech data on waste generation contain a lot of confidential cells. This concerns nearly all sectors. As a consequence, about 11% of the generated total is not publicly accessible.
- CZ reports zero tonnes for the generation of **animal faeces, manure and urine** (09.3) because CZ claims that all manure is used in agriculture and thus not counted as waste. (see QR 2008). Only in 2004 a minor amount was reported.
- Small businesses falling below the sampling thresholds are covered by waste statistics as far as they are served by municipal waste collection. Other companies below the threshold are not considered in waste generation. The resulting undercoverage can not be estimated. For most of the economic sectors the sampling threshold is set at 25 employees. For detailed information see QR 2008, table 4, page 10.

Breaks in time series

- n.a.

Further action required

- Validation revealed several mistakes (mainly misallocations resulting from the Business Register) that were promised to be corrected and updated in the next data delivery.

3.4 Denmark

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (37%), HH (17 %), NACE E (15%)
  - Hazardous waste: NACE C24-C25 (26%), NACE D (17%), NACE G-U (14%)
- The economic sectors **NACE C24-25** und **C26-30** generate between 32 % and 40 % of the Danish hazardous waste total.

Observations

- In **NACE C24-C25** (Manufacture of basic metals and fabricated metal products) and in **NACE C26-C30** (Manufacture of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment) the percentage of **hazardous waste** relative to the total waste was high in 2008 compared to other countries. A reason could be that "in Denmark, treatment of hazardous waste has been exempted from taxes until 2010. This could cause some businesses to classify their waste as hazardous, although it is not." (Validation 2006)
- In **NACE D** (Electricity, gas, steam and air conditioning supply), the total quantity of **hazardous waste** generated per inhabitant (13 kg/capita; 72 kt) was high in 2008 relative to other countries.DK stated that "the energy supply in Denmark relies very much on coal-fired power plants, which produce hazardous residues" (Validation 2008). A further possible reason could be a high share of waste incineration in energy production.
- For **NACE C23** (Manufacture of other non-metallic mineral products), the **total waste quantity** has decreased steadily since 2004. This could be due to the fact that a part of the businesses recycle their waste internally, without registering it, to avoid taxes on treatment of waste.
- For **NACE C31-C33** and NACE **E36, E37 & E39**, the **total waste** quantity and the total **hazardous waste** quantity was in 2008 very high compared to other countries. For **NACE G46.77** the **total waste** quantity was high in 2008 compared to the previous year. This could be due to the distribution of the ISAG-codes into the NACE-codes and the tax exemption of hazardous waste.
- The total amount of **hazardous waste** generated in 2008 (420 kt) was by 40% lower than the corresponding amount reported according to the **Waste Shipment Regulation** (648 kt). DK stated that "the difference is most likely due to a double-counting error in the data sent to the Waste shipment regulation." Data reported under the WSR will be checked and possibly revised.
- The Danish data set includes some data that are very likely to be misclassifications or data entry errors. Corrections would be helpful.
- Data show seeming inconsistencies in relation to **packaging data** for **glass waste** and **plastic waste**. The reasons for inconsistencies for glass waste are seen in the different data sources. With the new Danish Waste Data System, data on packaging waste will be the source for both, the reporting under the Packaging waste directive and under the WStatR on the long run. The answer on plastic waste is still pending.
- In **NACE C17-C18** (Manufacture of paper and paper products; printing and reproduction of recorded media), the total quantity of **hazardous waste** generated declined from 2006 to 2008 due to the closure of a paper packaging factory in 2006.

Methodological and quality deficits

- The main data source is the **ISAG-System** which is based on legally defined classifications that do no always match the respective EU classifications:
  - Several groups of economic activities according to ISAG are not compatible with the NACE aggregates required by the WStatR; data for missing sectors are estimated

mainly on the basis of the LoW-codes.

- Data on non-hazardous wastes are collected according to the ISAG classification and have to be converted into EWC-Stat categories.
- The ISAG classification does not distinguish between incineration (D10) and energy recovery (R1). All incinerated amounts are assigned to R1.

- ISAG relies on data from waste treatment facilities. Direct exports of waste might not be covered. Allocation of waste to the generating sector is based on the source-specification by the treatment facilities.
- Coherent with national statistics data refer to **primary waste** only. The waste amounts generated in sectors **E38** and **G46.77** are therefore low.
- Data on **treated waste** refer to waste generated in DK; imported waste is not included.
- As of 2010, a new data system shall be in place that is claimed to be fully compatible with WStatR requirements.

Breaks in time series

- n.a.

Further action required

- Answers to some validation follow-up-questions still pending. Data correction announced for WSR-data..
- Thorough look into the data and the quality report for reference year in order to assess the revised data strategy / system with regard to WStatR compliance.

3.5 Germany

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (53%), NACE C (14 %), NACE E38/G46.77 (10%)
  - Hazardous waste: NACE F (37%), NACE E38/G46.77 (28%), NACE C24-C25 (11%)

Observations

- For **NACE E38** (Waste collection, treatment and disposal activities; materials recovery), the quantities of **hazardous** and **non-hazardous** waste per inhabitant in 2008 were high compared to other countries. For hazardous waste, DE reported the highest figure of all countries, for the total waste the second highest figure after UK. The assumed reason is the general allocation of secondary waste, i.e. waste from LoW-chapter 19, to NACE E38.
- For **NACE G46.77** (Wholesale of waste and scrap), DE reports for 2008 an extremely high share of **hazardous waste** of 94.5%. The assumed reason is undercoverage with regard to non-hazardous waste / secondary raw materials due to methodological reasons.
- The **crosscheck** of WStatR data with **packaging data** shows an inconsistent high share of packaging compared to the recovered **paper and cardboard waste** total.
- For **NACE C10-C12** (Manufacture of food products; beverages and tobacco products), DE reported repeatedly a high amount of **hazardous** chemical preparation wastes (4.6 kg/cap in 2008) compared to other countries. Data were explicitly confirmed for 2006 and 2008. According to DE, a possible reason is seen in waste from research laboratories.

Methodological and quality deficits

- Waste statistics are mainly based on data from waste treatment facilities. Data on waste generation are reconstructed from the waste treatment data. Information on the origin of non-hazardous waste is limited whereas the origin of hazardous waste is largely known from administrative sources (consignment notes). For the following sectors, the allocation of the generated waste is done mainly on the basis of the LoW-code:
  - **NACE F**: waste of LoW chapter 17
  - **NACE E38**: secondary waste, i.e. waste from LoW-chapter 19

  The statistical unit concept of the WStatR is thus not fully implemented and the comparability by sectors across countries restricted. DE has introduced a four-yearly sample survey on waste generators in order to improve the allocation of non-hazardous waste. The survey includes **NACE C, D, E and G-U** and does **not cover NACE A, B and F**.
- Due to the treatment-based approach, German waste statistics suffer from **undercoverage** of **recyclable waste** that is not treated in a licensed treatment facility but is delivered directly from the generator to a company for reprocessing / recycling. This applies mainly to secondary raw materials from commercial sources. This assumption is supported by inconsistencies between WStatR-data and data on packaging recycling.
- Germany provides no separate data on the sector fishery (**NACE A03**). The respective amounts are included in **NACE A01-02** (see answer on clarification request 2008).
- The share of hazardous waste in households is lower in 2008 than 2006 because the discarded vehicles and discarded equipment are located to the service sector (G-U)

Breaks in time series

- As of 2008, around 16 million tonnes of mineral waste are allocated to the sector **NACE C20-22** (Manufacture of chemical, pharmaceutical, rubber and plastic products) instead of **NACE B**. The reason is a methodological change: the general allocation of waste from LoW-group 10 10 to NACE B is replaced by a more accurate approach. The result is a strong a decrease of the sector total in NACE B (-40%) from 2006 to 2008 and a dramatic increase of the total of NACE C20-22 (+356%) in the same period. It is not clear which waste types are actually included in the 16 million tonnes.

Further action required

- Further inquiry concerning the 16 million tonnes of waste shifted from NACE B to NACE C20-22: what waste types are concerned (LoW-codes)? Is there a possibility to retrospectively adjust the data to eliminate the break?

3.6 Estonia

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE B (37%), NACE D (28 %), NACE C (19%)
  - Hazardous waste: NACE D (71%), NACE C19 (26%), NACE G-U (1%)
- Waste generation in EE is characterised by the exclusive use of **oil shale** for energy production. This leads to extremely high amounts of mainly hazardous combustion waste from the **energy sector** (ca. 3 900 kg/capita) and hazardous chemical deposits and residues from the refinery sector (ca. 1 000 kg/capita).
- Furthermore, the generation of considerable amounts of **non-hazardous wood waste** in **NACE C16** (ca. 960 kg/capita) contributes to the high waste generation in EE compared to other countries. After FI, EE reports the 2nd highest per-capita generation in this sector.

Observations

- Hazardous waste generation in **NACE A01-02** has increased considerably from 2004 to 2008. The reason seems to be connected with the waste-factor based estimation applied in EE (Validation 2008). It is not clear why no similar increase has been observed for the generated total in the sector.
- In **NACE 16,** a misclassification led to a peak for **hazardous** waste generation in 2006. EE announced to correct the data together with the delivery of the 2010 data. (Validation 2008)
- For **NACE C17-C18**, the **total waste** quantity in 2006 was very high compared to 2004 and to 2008. This peak results from high amounts of common sludges reported by one company. The figure will not be adjusted because the high amount is not necessarily a mistake. (Validation 2008)
- In **NACE C19** (Manufacture of coke and refined petroleum products), the **total waste** quantity doubled since 2006. The strong increase corresponds with the economic growth in the sector in recent years in terms of value added and of number of enterprises. (Validation 2008)
- For **NACE C23**, the data shows extreme fluctuations for **hazardous** and for **non-hazardous** waste. EE confirmed the data and explained that the changes from 2006 to 2008 result from the reporting of Estonia's biggest cement producer. (Validation 2008)
- In **NACE C26-C30**, the huge decrease of **hazardous** waste but also of the **total waste** results from the change of the NACE attribution of one big company. The company is active in electricity production (which explains the high amount of hazardous combustion waste) and changed accordingly to **NACE D**.
- Sector **NACE C31-33** (Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment) shows a high waste intensity compared to other countries. The reason might be that the sector is dominated by furniture producers and the low number or other companies which could explain the high waste quantity per value added.
- Metal wastes (EWC-Stat 06): EE reports the highest metal waste total countries and for all reference years. The reported amounts are particularly high in the sectors **NACE G46.77** and **Households** which contribute 36% and 22% respectively to the metal waste total:
  - For **NACE G46.77**, EE reports together with UK by far the highest amount of **metal waste** (more than 200 kg/capita). EE explained that most of the waste generated in this NACE category were secondary metallic wastes generated in enterprises dealing with collecting sorting and exporting of metallic wastes; about 490 000 tons of metallic wastes were exported in 2008. The railway metals made up the biggest share of metallic waste in 2008 reported in this NACE category. Renovation and dismantling of railways is probably one reason for the increase of metal scrap from 2006 to 2008.
  - For the sector **Households**, EE reports the highest metal scrap amount of all countries

and for all references years. The reasons are unclear. • The crosschecks with packaging data revealed inconsistencies for the materials **plastic and glass**. The answer to the respective question is still pending.
Methodological and quality deficits • -
Breaks in time series • Misclassification of waste lead to a peak of **hazardous waste** generated in **NACE 16** in 2006. EE announced to correct the value. • High amounts of **common sludges** in **NACE C17-18** led to peak of waste generation in the sector for the reference year 2006 (See also observations)
Further action required • Validation revealed two small mistakes in the data sets 2006 ("Solidified, stabilised or vitrified wastes") and 2008 ("sorting residues") and a classification problem to be avoided in the next data collection. All three issues were promised to be corrected in the course of the next data delivery. • The reasons for the high metal waste amounts generated should be investigated.

3.7 Ireland (not yet validated)

Structural characteristics (economy, geography, ..) •
Observations •
Methodological and quality deficits •
Breaks in time series •
Further action required •

3.8 Greece

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE B (56%), NACE D (16%), NACE F (10%)
  - Hazardous waste: NACE G-U (60%), NACE C24-C25 (26%), NACE C26-C30 (4%)
- Over 50% of the generated waste total originates from the **mining sector**. The most important minerals extracted in Greece are lignite, bauxite and magnesite.
- Greece is producing electricity mainly from lignite and only a minimal production from other sources. As a result, GR generates high waste amounts in sector **NACE D**, especially combustion waste (ashes) under code 12.4. (Validation 2008) The Greek data for **NACE D** show no breakdown by waste categories because the data are either zero or confidential.

Observations

- GR reports an extremely sharp increase of **non-hazardous mineral waste** from the mining sector (**NACE B**) which is explained with a better response rate to the ELSTAT survey on mines and quarries.
- For **recovery other than energy recovery**, the total amount treated in 2008 was by ca. 50% (5 million tonnes) lower than the amount reported in 2006. The high amount in 2006 was mainly caused by the waste category **animal faeces, urine and manure** (EWC-STAT 9.3). The answer to the respective questions is pending.
- The total amount of waste **disposed of (excl. incineration)** has increased from 2004 to 2008 by about 40 million tonnes from 22 million tonnes (2004) to 62 million tonnes (2008). Most of this increase (about 38 million tonnes) results from the waste category **mineral waste** (EWC-Stat 12). The development corresponds closely to the increase of the generated amounts of non-hazardous mineral waste in **NACE B** (see answer to the above question concerning NACE B).
- The **cross-check** with **WEEE-data** revealed that the amounts reported for discarded equipment under the WStatR were much too low compared to the WEEE collected. GR explained that discarded equipment from households is reported under the category 10.2 household and similar waste.

Methodological and quality deficits

- **ELSTAT** carries out a sample survey on sectors 3 to 13 (**NACE B and C**) that covers all waste categories. For the other sectors there exists either no surveys or surveys of different ministries that cover only selected waste categories.
- For 2008, GR reported no data for the following sectors: **NACE A01-02, A03, G46.77**. In 2006, some data from different sources were reported for **NACE A01-02**.
- Data coverage is limited to one or very few waste types in the sectors **NACE E36, E37, E39, NACE E38 and HH**, as specified in the following (data source: Ministry of Environment):
  - E36, E37, E39: data on common sludges of urban waste (EWC-Stat 11);
  - E38: data on the part of municipal waste that is destined for recycling;
  - Households: data reported under code 10.1 represent the collected municipal waste, as derived from the census survey of the Ministry of Environment conducted at the “places of sanitary burial of waste”.
- Data coverage for the sector **NACE F** is also limited. For 2004, all data were missing except an estimate for non-hazardous mineral waste. In 2006, some additional waste categories were reported. In addition, data for 2008 are the same as for 2006 with the exception of the waste categories household and similar waste (10.1) and hazardous mineral waste (actually asbestos waste). However, the only hazardous waste reported so far is asbestos waste (category mineral waste). Data are based on a (one-off) study of the Ministry of Environment for the year 2006. Reasons might be shortcomings in the permitting of treatment facilities for

C&D waste. (Validation 2008)
Breaks in time series • GR reports a strong increase of mineral waste in sector **NACE B** since 2004. According to the quality report 2008 (page 23), this increase is due to the better response rate in mines and quarries in the waste code 12 (mineral waste). • GR produced data on **NACE A01-03** for 2006. The data were used as estimates for 2004. And now the time series is not continued. This results in a serious break of 4.7 million tonnes for NACE A01-02.
Further action required • Concerning the limited data coverage, GR states that there are no plans for changes / improvement in the unit but that a change is only probable in the framework of a general restructuring of ELSTAT statistics. • Two follow-up questions are pending

3.9 Spain

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (30%), NACE B (17 %), HH (16%)
  - Hazardous waste: NACE G-U (31%), C24-C25 (21%), C20-C22 (17%)
- ES regularly reports high amounts of **discarded vehicles** (08.1) in sector **NACE A03** (Fishing and aquaculture) because discarded ships are reported correctly under this category. (Validations 2006 and 2008).

Observations

- For **NACE A01-02**, the total waste quantity fell constantly in recent years from 18.0 million tonnes (2004) to 15.1 million tonnes (2006) and finally to 11.3 million tonnes in 2008. ES explains that, according to the survey carried out, the area where manure is applied as fertiliser as well as the amount of manure per hectare, both increased from 2006 to 2008. As a result, the amount of manure that is counted as waste decreases accordingly. (Validation 2008)
- In **NACE C16**, the total waste quantity relative to the number of inhabitants (296 420 tonnes) was 61% lower in 2008 when compared to the previous year (741 059 tonnes). According to ES, several companies handled sawdust in 2008 as by-product whereas the same material was reported as waste in previous years. (Validation 2008)
- In **NACE D** (Electricity, gas, steam and air conditioning supply), the total quantity of **hazardous waste generated** varies considerably over the years. The reported amount nearly doubled from 34 322 tonnes in 2004 to 61 767 in 2006, and fell again to 30 957 tonnes in 2008. The drop from 2006 to 2008 is due to the fact that energy producing facilities through co-incineration have moved from section E (NACE Rev.1) to division 38 (NACE Rev.2) as they treat waste by incineration as a mean to produce energy. (See also the following observation)
- ES reports high amounts of **solidified, stabilised or vitrified wastes** (EWC-STAT 13) in **NACE E38**. The respective figures are estimates based on PRTR-reporting of some companies. 22% of the amounts are actually reported by companies, the other 78% are grossed up.
- The amount of **discarded equipment** generated is lower than the amount of **WEEE** collected. ES assumes that some WEEE might be reported under the category 10.1 as bulky waste.
- ES reports a decrease for the **recovery (other than energy recovery**) of **plastic waste** by 35 % or 0.9 million tonnes t from 2004 to 2008.

Methodological and quality deficits

- 9 of 19 regions in Spain are not able to report on the capacities for **D10** operation. Hence, the incinerated amounts exceed the reported capacities by far.
- Spain uses **E-PRTR**-data for the estimation of waste generation in sector **NACE E36**. A combined estimation (PRTR-based plus survey-based) has been used for NACE divisions **E37, E38 and E39**. (Quality Report 2008)

Breaks in time series

- -

Further action required

- Additional efforts announced to overcome a coverage problem regarding treatment capacities and a classification problem regarding discarded equipment.

3.10 France

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (73%), HH (9%), NACE G-U (7%)
  - Hazardous waste: NACE F (23%), NACE E (19%), NACE G-U (17%)
- Waste generation is dominated by the sector **NACE F.**

Observations

- FR reports an overall increase of **hazardous waste** compared to 2006 by 1.3 million tonnes or 13 %. This increase is the result of an enormous rise of hazardous **C&D waste** on the one hand (result of new survey) and the considerable decrease of hazardous waste in most other sectors (partly due to the decrease through use of E-PRTR data).
- The generation of **hazardous wood waste** (07.5) in **NACE F** has dramatically decreased by 2.4 million t (-97.1%) from 2.47 million t (2006) to 0.07 million t (2008). No clear answers or suggestions until now.
- The generation of **hazardous mineral waste** (12.1-12.3, 12.5) in **NACE F** has also changed considerably. In this case, the reported amount has increased by 1.88 million t from 0.12 million t (2006) to 2.0 million t (2008). The reason is the new survey.
- France reports high amounts of mixed **and undifferentiated waste** compared to other countries and contributed in 2008 33% to the EU 27 total for this waste category.
- The figures for **recovery (other than energy recovery**) show a decreasing trend from 2006 to 2008 for metallic wastes (06), glass wastes (07.1), paper and cardboard wastes (07.2), rubber wastes (07.3) and plastic wastes (07.4). FR could not provide a plausible explanation.
- **Cross-checks** with **packaging waste** data revealed inconsistencies for the materials **plastics and glass** (WStatR amounts are too low). The answers to the respective questions are still pending.
- It seems as if about 5 million tonnes of **household and similar waste** that were reported under **energy recovery** in 2004 are reported under the **incineration** since 2006.

Methodological and quality deficits

- It seems that France collects data on **non-hazardous waste generation** not according to the LoW but according to a few and partly unspecific waste categories.
- In the quality report FR explains that data on **hazardous waste** were produced for 2008 in the same way as in the previous years, i.e. on the basis of annual reports from "Installations classés pour la protection de l'environement" (ICPE). In the answer to the validation questions FR states that data are exclusively based on E-PRTR information, which would be a totally different and questionable approach. The answer for clarification of this issue is still pending.

Breaks in time series

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Further action required

- The answers to the follow-up-question round require further explanations. In particular, the important question on the use of E-PRTR-data has not been satisfactorily answered.

3.11 Italy

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (39%), NACE C (24%), HH (18%)
  - Hazardous waste: NACE E38, G46.77 (20%), NACE C20-C22 (18%), NACE C24-C25 (17%)

Observations

- For several sectors, the hazardous waste amounts show a considerable variation over time. IT points out that "an important contribution to total production is given by waste not directly related to specific industrial sectors; in particular, waste consisting of contaminated soil (code 170503* - EWC-Stat code **12.6**), waste arising from remediation of contaminated sites and, in particular, liquid wastes and aqueous concentrates derived from groundwater remediation of industrial sites subject to remediation activities and sent to the processing operations performed on-site or off-site (waste code 191307* - EWC-Stat code **03.2**). Significant increases in the quantities of hazardous waste deriving from groundwater remediation, conducted at the sites of localization of the industry (waste code 191301* - EWC-Stat code **12**). In addition, even if less significant, were detected increases in the quantities of waste identified by waste codes 170603* and 170903* (EWC-Stat code **12**)."
- IT reported much lower quantities of hazardous and **non-hazardous waste treated** than the quantities **generated**. IT explains the difference with the high amounts undergoing pre-treatment and with exports of waste (for details see validation questionnaire 2008).
- In spite of the lower data coverage resulting from legal changes described below, the waste generation has increased from 2006 to 2008.

Methodological and quality deficits

- Data coverage has been changing over the years through several legal changes. As a result, data coverage through **MUD** is lower than in previous years. Some sectors are covered by estimation (for details see validation 2008 and QR). Estimation procedures were put in place for: manufacture of food product (**C10-C12**), textile and tanning industry (**C13-C15**) wood industry and wood processing (except production of furniture)(**C16**), paper industry (**C17-C18**), part of the chemical and petrochemical (**C20-C22**), metallurgical industry and manufacture of metal products (**C24-C25**), construction and demolition activities (**F**).

Breaks in time series

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Further action required

- None

3.12 Cyprus

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE B (27%), HH (24 %), NACE F (23%)
  - Hazardous waste: NACE G-U (65%), HH (13%), NACE D (6%)
- The significant contribution of **NACE B** to the generated waste total is assumed to be due to the mining and processing of copper ore.

Observations

- For **NACE B**, the total waste quantity (639 kg/capita, 505 kt) was about 18 times higher in 2008 when compared to the previous year (36 kg/capita; 28 kt). CY points out that "the reason for this increase is the inclusion of backfilling activities. Large quantities of waste used for backfilling are included in the 2008 data, whereas in 2006 these quantities were not reported as waste."
- For **NACE D** Cyprus reports a high share of **hazardous waste**. This observation is explained with the use of heavy oil for electricity production (which seems to produce a high ratio of hazardous to non-hazardous waste; the total waste produced in the sector is low.)
- In **NACE F**, the total quantity of **hazardous waste** generated (0.4 kg/capita; 273 tonnes) was 70% lower in 2008 than in 2006 (1.1 kg/capita; 855 tonnes) and 99% lower than in 2004. The answer to the respective question is still pending.
- For **recovery other than energy recovery**, the total amount treated in 2008 (745 kt) was by the factor 4.1 higher than the amount reported in the previous year. The reasons are the inclusion of backfilling activities in the 2008 data (the largest quantity) and secondly, the start of a collective system of recycling of packaging waste in 2007.
- In 2008, the generated amount of discarded vehicles was lower than the amount of ELV reported under the **ELV-Directive** because "the data for discarded vehicles include only the bales of the vehicles. On the other hand, the quantity reported for the purpose of the ELV-Directive covered the total weight of a vehicle, including tyres, catalysts, oils, etc."

Methodological and quality deficits

- In the waste category "**metallic waste**" there is not only included the residues derived from the production process but all possible metallic waste that an enterprise may have. This is the case for **C16, C17-C18, C20-C22, C23, C24-C25, G46.77 and G-U.** A correction has been made for **G46.77 and G-U**.
- It seems that CY reported for 2004, 2006 and 2008 the specific composition of '**household and similar waste**' (W101) instead of the composition of the NACE category **'waste generated by households'** (Item 20).

Breaks in time series

- The **non-mineral waste** totals and the **hazardous waste** totals show a sharp decline from 2004 to 2006. For non-mineral waste, high decreases are reported for common sludges in NACE A01-02 and animal and vegetal waste from NACE C10-12. For hazardous waste rapid declines are reported for industrial effluent sludges, used oils, and acids and alkaline waste. Mainly the sectors NACE C10-12, C13-15, F, G-U are concerned.

Further action required

- Particular attention during the next survey was announced to be laid to the reasons for the strong decline of the hazardous waste total from 2004 to 2008. Possible corrections were also promised if required.
- It appears that Cyprus again applied the composition approach regarding household and similar waste / recyclables, i.e. they reported parts of the mixed stream under the separate waste categories, although these amounts are collected in mixed form. This should be monitored.

3.13 Latvia

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: HH (41%), NACE C (34%), NACE G-U (11%)
  - Hazardous waste: HH (53%), NACE C24-C25 (22%), NACE G-U (13%)
- The high share of waste from **households** compared to the generated total indicates that LV has considerable problems with data coverage and/or allocation of waste to the generating sectors.

Observations

- LV reports the lowest waste generation of all countries for total waste and for **non-mineral waste**. In combination with other observations this seems to indicate a considerable undercoverage of waste generation.
- LV reports extremely low amounts of **mineral wastes and soils** which is a clear sign for undercoverage mainly in the **construction sector** but possible in other sectors was well.
- For the sector **Households**, the total amount of waste generated was significantly lower in 2008 (606 kt) than in 2006 (853 kt) which is caused mainly by a drop of household and similar wastes (10.3) (2008: 570 kt; 2006: 760 kt). In spite of this decrease the waste from households amounted in 2008 to 41 % of the national total! Furthermore, there are several recyclable materials in 2006 (e.g. 5.7 kt glass, 17.7 kt paper, 8.4 kt plastics) for which there are no values reported 2004 and 2008. The respective answer from LV in the course of data validation 2008 was not helpful.
- LV reports a very high amount of **discarded vehicles** in sector **NACE A01-02**. The data are based on a survey that reports all vehicles that are “stored somewhere in the countryside”. (Validation 2008)
- **Metal packaging** accounted for 35% of the **total metal recovered**. This indicates a considerable undercoverage with regard to non-packaging metal wastes. LV refers in its answer to the unclear definition of metal waste. (Validation 2008)
- The comparison of **wood waste recovery** and **wood packaging waste recovery** also indicates an undercoverage of the WStatR data with regard to wood waste.
- Comparably high amounts of **PCB-contaminated** material in some sectors result from the fact that LV carried out a project on PCB-equipment in 2008. (Validation 2008)

Methodological and quality deficits

- Data collection on waste generation is based on a survey (3-wastes carried out by the REBs) that covers all companies that have IPPC permits on polluting activities (A and B category) and all enterprises, having any permit on waste management operations. The extent of (under)coverage of the survey is unclear.

Breaks in time series

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Further action required

- Three answers to second question round are pending. One flag on the data for the population served needs to be changed.

3.14 Lithuania

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE C (40%), HH (20%), NACE A (19%)
  - Hazardous waste: NACE G-U (57%), NACE HH (12%), NACE C24-C25 (10%)
- LT reports since 2004 a high waste generation for **NACE C20-C22** compared to other countries. The waste results from one of the largest companies of the country (main activity: production of fertilizers). As a result, the company generates a huge amount of waste - **phosphogypsum**. Compared with 2006 the amount decreased by about 75 thousand tonnes in 2008 because of the production activity. The company is disposing of the total amount of waste at its own specific disposal facility.

Observations

- In **NACE A01-A02**, the total waste quantity was 33% lower in 2008 than in 2006. The reason is that urine/manure used as fertiliser was included in previous years but excluded in 2008. LT assumes that the generated amount of manure is still overestimated as it includes considerable amounts of stored manure that will be used in agriculture.
- As a result of the exclusion of **manure/urine** from waste statistics as reported above the amount of manure/urine recovery fell from 908 kt in 2006 to zero tonnes in 2008.
- In **NACE F**, the total quantity of **hazardous waste** generated was by 90% lower in 2008 than in the previous year. LT explained that in 2006 one company did a lot of road construction.
- LT reports very low amounts of **mineral wastes and soils**. This is probably a sign for a low data coverage mainly in the **construction sector** but possible in other sectors was well.
- In **NACE C19**, the total quantity of **hazardous waste** generated was by 70% lower in 2008 than in the previous year due to an improved reporting. For details see answer to validation questions 2008.
- 'The quantity **incinerated** (51.582 tonnes) is bigger than the capacities of the incineration facilities (4174.91 tonnes) (2008). Some waste treatment enterprises that incinerates waste, for which not required any special environmental requirements like incineration of wood without energy recovery, don't need IPPC permit.

Methodological and quality deficits

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Breaks in time series

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Further action required

- Three to four corrections announced for July 2011, retrospective corrections discussed, and one follow-up question not answered. Revised data sent in August 2011.

3.15 Luxembourg

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (86%), NACE C (7%), NACE HH (3%)
  - Hazardous waste: NACE F (35%), NACE C24-C25 (26%), NACE G-U (19%)
- Waste generation in Luxembourg is dominated by **mineral waste** from the **construction sector** that accounted in recent years for 70 % to 86 % of the generated total. With an amount of 17 tonnes per capita (2008) Luxembourg reports by far the highest waste generation in the construction sector (NACE F) of all countries.

Observations

- LU reports high amounts of hazardous wood waste for the sectors **NACE C26-C30** and **NACE G-U**. Especially the reported amount in NACE G-U is very high in comparison to other countries. Several questions concerning wood wastes were asked in the validation 2006 but remained unanswered.
- LU reported a higher quantity of **non-hazardous waste treated** (11 585 kt) than the quantity of non-hazardous waste **generated** (9 393 kt). The answer to the respective question is pending.
- LU reported a much lower quantity of **hazardous waste treated** (47 kt) than the quantity of hazardous waste **generated** (199 kt). At the same time, the total amount of hazardous waste generated in 2008 (199 kt) was by the factor 2.3 higher than the corresponding amount reported according to the Waste Shipment Regulation (85 kt).

Methodological and quality deficits

- **Data collection** in LU focuses on data from **waste transporters** and **treatment facilities**. Reports from waste generators are mentioned but do not seem to play an important role. Direct exports from waste generators for recovery and waste taken back and exported by suppliers (e.g. batteries) might not be covered by the reported generation data.
- It seems that the allocation of waste to the generating sectors is done on the basis of information from the transporters and treatment facilities on the origin of waste.

Breaks in time series

- For 2006, LU reported dramatically high amounts of **sorting residues** and **household and similar wastes**. As a result, the non-mineral indicator value for 2006 is by the factor 2 higher than for 2004 and 2008. The respective data for 2006 are wrong and will be updated.

Further action required

- Correction of data on sorting residues and household and similar waste mentioned above are pending. Two questions not answered.

3.16 Hungary

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (26%), NACE C (24%), HH (17%)
  - Hazardous waste: NACE E (21%), NACE G-U (16%), NACE C24-C25 (15%)

Observations

- Constant decrease of the **non-mineral waste** indicator from 2004 to 2008 by 35% (6.7 million tonnes), mainly due to considerable reductions of manure (exclusion of amounts reused in agriculture by 3.4 million tonnes), and the decrease of household and similar waste (by 1 million tonnes). (Validation 2008)
- A further general explanation for the decrease of **non-hazardous w**aste amounts is the improvement of the evaluation method. It is assumed that the former methodology overestimated the generated amounts. (Validation 2008)
- Hazardous waste generation fell from 2006 to 2008 by nearly 50 %. The main reason is the decrease of contaminated soil in **NACE E38**. The higher amounts in 2006 were caused by a big remediation measure that ended before 2008. (Validation 2008)
- In several sectors significant changes of the **hazardous waste totals** over time were caused by remediation measures. (Validation 2008)
- In **NACE G-U**, the generated total decreased from 2006 to 2008 by nearly 60%. The reasons are problems with the estimation of **household and similar waste** (municipal waste) from (small) companies. For details see Validation questionnaire 2008.
- For 2004, the **treated** waste total amounted to only 40% of the total generated. The treated total has since increased considerably and corresponded in 2008 to 78 % of the total treated.
- HU reported some soil and fertile which are not waste under **NACE A01-A02** and **NACE F** as waste. This led to much lower quantity of non-hazardous waste **(NHW) treated** (15.3 million tonnes) than the quantity of **NHW generat**ed (19.7 million tonnes). The EWC-Stat codes are 12 (excl. 12.4, 12.6), 09 (excl. 09.11, 09.3) and 09.3. HU corrected the data.
- HU reported a much lower quantity of hazardous waste **(HW) treated** (450 kt) than the quantity of **HW generated** (671 kt) which can be explained due to a change of hazardous nature during pre-treatment(s).

Methodological and quality deficits

- The Hungarian administrative Waste Information System seems to be well designed and adapted to the WStatR requirements. Data quality seems to suffer from the fact that 2004 was the first reference year for the newly introduced system. The data are assumed to have gradually improved since then. Problems mentioned for 2004: unintended double-counting, calculation of dry weight for sludges with questionable conversion factors.

Breaks in time series

- Decrease of the **hazardous waste total** from 2006 to 2008 by about 50% due to the end of a big remediation project.

Further action required

- Data estimation for EWC-Stat 10.1 announced to be improved for 2010 data. One answer in response to the validation questionnaire pending.

3.17 Malta

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (73%), NACE G-U (14%), HH (11%)
  - Hazardous waste: all hazardous waste reported in NACE G-U (100%)

Observations

- Although the waste amounts in the sector **NACE F** show a strong and steady decrease since 2004, the generation was still high in 2008 compared to other countries. According to MT, the development reflects the high demolition and construction activities in recent years (for details see validation questionnaire 2008).
- The generated amounts of **metallic wastes** show a high variation over time. The reason is the use of different data sources in each of the three reference years (for details see validation questionnaire 2008).
- For the waste category **discarded vehicles**, Malta reported the highest generated quantity of all countries relative to the number of inhabitants.

Methodological and quality deficits

- For the sectors **NACE A to NACE F**, MT reports generation data only for a few waste categories.
- Due to methodological problems all hazardous waste is reported under **NACE G-U**.

Breaks in time series

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Further action required

- - One answer on cross-checks ELV pending (data suppliers asked)

3.18 The Netherlands

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (60%), NACE C (16%), HH (10%)
  - Hazardous waste: NACE F (60%), NACE E38, G46.77 (9%), NACE G-U (9%)
- Due to its geographical situation, NL is the country with the highest amounts of **dredging spoils** in **NACE F** and overall. In the treatment side, this results in comparably high amounts that are disposed of by the treatment D6 und D7.
- NL reports high quantities of **acid, alkaline or saline waste in sector NACE 19**. The reason is the high amount of sulphur that arises from desulphurisation of oil products. NL reports this as waste although it has a specific application in an industrial process and might be considered as by-product in other countries. Another explanation for the high value is that the Netherlands has a large refinery industry per capita compared to other EU member states

Observations

- Sharp changes of **hazardous waste generation** over time in some sectors (from 2006 to 2008) are explained by the allocation of hazardous waste to the generating sector from the registry of hazardous wastes. Reasons are the low accuracy of the applied method (A03) and changes of the method (C13-C15). (Validation 2008)
- **Recovery other than energy recovery** decreased from 17.6 million tonnes in 2004 to 9.6 million tonnes in 2006. The reason is that in 2004 waste amounts were reported in wet weight. NL announced to update the figures.
- NL reports a high amount of **hazardous waste** in sector **NACE F**, consisting mainly of mineral waste and contaminated soil / dredging spoils. The mineral wastes in 2006 and 2008 comprise also construction and demolition waste from other NACE categories that deliberately allocated to NACE F, because the exact origin was not known.

Methodological and quality deficits

- The quality report 2008 describes on pages 34 to 36 several methodological changes that may have an impact on the time series.
- In the QR, NL points out that “the treatment data of 2008 considers for the first time **import and export green-listed wastes**. These imports and exports are considerable for the Netherlands, thus are expected to have a significant impact on the treatment data for plastics, rubber, wood and textile.” It is unclear what this really means for the data.
- NL reports all **discarded vehicles** (EWC-Stat 08.1) as hazardous waste and all **discarded equipment** (EWC-Stat 08 excl. 08.1 and 08.41) as non-hazardous. The explanation is that data collection on these two categories does not distinguish between hazardous and non-hazardous waste. Discarded vehicles are generally assumed to be hazardous on account of the contained liquids and discarded equipment is considered as non-hazardous. (Validation 2008)

Breaks in time series

- **Hazardous waste generation** increases from 2004 to 2006 by about 3 million tonnes. The rise is nearly completely due to an increase of mineral wastes and contaminated soils / polluted dredging spoils in NACE F caused by methodological changes.

Further action required

- NL was asked whether a retrospective adjustment of the low hazardous waste generation reported for 2004 is feasible. The answer is pending.

3.19 Austria

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (56%), NACE C (23%), HH (7%)
  - Hazardous waste: NACE C24-C25 (21%), NACE F (18%), NACE E38/G46.77 (14%)

Observations

- **Hazardous waste generation** was significant higher in 2008 than in 2006. The reasons are outlined in the QR and include:
  - the increase of contaminated soils from big remediation projects;
  - the classification of asbestos cement as hazardous for 2007;
  - the use of additional data sources / closure of data gaps.
- The total amount of **hazardous waste generated** in 2008 (1330 kt) is by factor 1.2 higher than the corresponding amount reported according to the **Waste Shipment Regulation** (1093 kt). AT explained that for the Basel Convention only the amounts attributed to the waste Codes Y1-Y45 and Y47 were reported. (Validation 2008)
- The **crosschecks** with the **packaging data** showed that in 2008 the amount of **plastic packaging recovered** acc. to the Packaging Directive (79.9 kt) was by the factor 1.2 higher than the amount of total plastic recovered according to the WStatR (66.8 kt). AT explained that the respective WStatR data are incomplete. A correction will be considered for he next reporting round. (Validation 2008)
- **Textile waste** (W07.6) increased from 2006 (4.426 t) to 2008 (91.620 t) because of use of additional data sources and better allocation to **C13-C15**.
- High values in **C19** in 2004 can be related to **construction activities** in this sector. Changes in the amount of hazardous waste are also not uncommon. Additionally a misclassification could be possible because of the fact that the owner of the waste has to declare the economic activity.

Methodological and quality deficits

- Austria uses the national substance-oriented waste nomenclature ÖNORM S 2100. The ÖNORM waste types are directly converted into the 48 waste categories required by the WStatR.
- Data coverage with regard to the waste category **non-hazardous dredging spoils** is unclear. Austria reported for all reference years that zero tonnes are generated. In the QR 2004 it said that the respective amounts are included in the category **mineral wastes**. In the QR 2006 it is said that dredging spoils do not occur in Austria. The QR 2008 does not mention the topic.
- On account of methodological changes the data for 2008 are closer to the data for 2004 than to the 2006 data (for example in NACE D). (see QR 2008)

Breaks in time series

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Further action required

- AT announced to correct the figures on plastic recycling in 2008 in the course of the next validation round.

3.20 Poland

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE C (40%), NACE B (24%), NACE D (14%)
  - Hazardous waste: NACE C24-C25 (28%), NACE G-U (23%), NACE E38/G46.77 (16%)
- PL has been reporting high total waste quantities in **NACE C24-C25** (Manufacture of basic metals and fabricated metal products) (984 kg/capita; 37.4 million tonnes; 27% of the total waste) already since 2004. The explanation is that about two thirds of this amount are produced by one company that enriches copper ore and produces high amounts of "Tailings from enrichment by flotation of non-iron metal ores ..." (specific Polish waste code). Although the activity belongs rather to NACE B the allocation is correct acc. to Polish statements due to the main activity of the respective company. (Validation 2004/2006).
- Energy production relies very much on coal leading to important total waste amounts in the **energy sector (NACE D)**.

Observations

- **Cross-checks** revealed inconsistencies for **WEEE, ELV and packaging data** (plastic and glass). Reasons not yet identified; answer pending.
- **Hazardous waste generation** in **NACE C24-25** decreased from 2006 to 2008 by 937 kt or 70% due to technological changes in the main producing company. This change leads to a reduction of the hazardous waste total by nearly 40 %. The reason for the reduction is a change in technology of the main waste producer; the generated waste is no longer classified as hazardous waste. (Validation 2008) This development led also to a decrease of hazardous waste amounts reported under treatment category land treatment. (Validation 2008)
- **Hazardous waste generation** in **NACE D** fell by 170 kt (more than 90%), mainly because one company that produced 160 kt of hazardous industrial effluent sludges stopped its activity in 2007. (Validation 2008)
- The data show a high variation over time for **recyclables** reported in the treatment category **recovery without energy recovery**.
- The high fluctuation of **energetically recovered waste** in the period 2004 to 2008 is due to new emission standards that came onto force in 2008 and forced some facilities to stop or to the use of waste for energy recovery. (Validation 2008)

Methodological and quality deficits

- Poland collects data according to the European List of waste but has introduced a high number (about 80) specific **Polish waste codes** in addition to the 839 codes of the European List of Waste. The Polish waste codes are integrated into the structure of the LoW (six-digit codes with endings 80 to 89).
- Poland has also introduced an additional and rather unspecific **recovery code**, i.e. **R14** “other activities leading to the total or partial waste recovery of to the recovery of substances and minerals from waste, including their usage, not included in R1-R13”.)

  In addition, Poland collects data on waste treatment according to different aggregates. This concerns mainly the following treatment categories:
  - deposit into or onto land (includes D1, D3, D4, D5, D12, D7 and D9)
  - land treatment and discharge into waster bodies (includes D2 and D8); D6 and D7 are not allowed or not used

  As can be seen, the pre-treatment operations that are excluded from the WStatR, can not be separated in Poland. In the course of implementing Directive 2008/98/EC into Polish law the additional R and D codes will be abolished and the treatment categories will be in line with the WStatR requirements. (Quality reports 1004 – 2008; validation 2008)

- From 2006 to 2008, Poland has changed the data source for data on **waste generation** in the sector **NACE A**. For 2006, data were based on a study of the Ministry of Agriculture and Rural Development. As of 2008, data of the IWMS are used. The new data are in line with waste definition, i.e. manure and other vegetal waste are not considered as waste where they are used in agriculture. The data for the category 09.3 Animal faeces, urine and manure have been corrected retrospectively which led to a immense reduction of waste generation in NACE A. No retrospective correction has been carried out for the categories 09 (excl. 09.11 and 09.3) and 09.11 although the reductions from 2006 to 2008 are considerable.
- For 2008, Poland reported no data on **dredging spoils (EWC-Stat 11.3)** because data are available only in wet weight (625 kt). Poland claims that an estimation of the water content is not possible.

Breaks in time series

- The reductions of the generated amounts of the waste categories 09 (excl. 09.11 and 09.3) and 09.11 by about 15.5 million tonnes that are due to methodological changes result in a decrease of the sectoral total for NACE A01-02 of more than 90% and also has an impact on the time series of the non-mineral waste indicator. The indicator decreases from 2006 by 2008 by about 430 kg/capita or 21%.

Further action required

- One follow-up question on retrospective correction of animal and vegetal waste not answered.
- Data on dredging spoils are only available in wet weight (see Quality Report). Conversion to dry weight missing.
- Data correction in NACE G46.77 should be verified (data update sent 12th of July 2011).

3.21 Portugal

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE G-U (28%), NACE C (25%), NACE F (22%)
  - Hazardous waste: NACE G-U (73%), NACE F (11%), NACE B (3%)
- For **NACE G-U (excl. G46.77),** PT reports the highest waste generation of all countries; the sectoral total represents 28% of the generated total. The **hazardous waste** generated in the sector is also very high compared to other countries and accounts for 73% of the national total. PT could not come up with an explanation so far.

Observations

- Data on **hazardous waste generation** are very unstable and don't seem to be reliable. Total hazardous waste generation more than doubled from 2004 to 2006 (from 2.3 million tonnes to 6.1 million tonnes) and then dropped back to 3.4 million tonnes. In spite of this steep decrease, hazardous waste generation, in particular for used oils, was still very high in several sectors compared to other countries in 2008. The reported quantity of used oils of 1.2 million tonnes accounted for more than 20% of the EU 27 total for used oils.
- For **NACE C13-C15** (Manufacture of textiles), PT reports by far the highest waste total of all countries. Although it is acknowledged that PT has a strong textile and leather industry the generated amounts, especially for the category textile waste (07.5), seem to be considerably overestimated (validation 2008).
- In **NACE F**, total waste generation more than doubled from 2006 to 2008. According to PT, a possible reason could be that a legal regulation on the management of C&D waste came into force in the second half of 2008 (validation 2008). However, the increase is mainly due to an enormous amount of 'mixed and undifferentiated waste (nhaz)' (10.2) of 348 kg/capita in 2008 compared to 0.3 kg/capita in 2006 that could not be explained by PT.
- The **cross-check of WStatR** and **packaging data** revealed considerable inconsistencies for glass and **paper/board** waste (for details see validation 2008).
- The amount of waste **generated** is by 65% or 15 million tonnes higher than the amount **treated**. PT assumes that one reason is the wrong and extensive usage of treatment codes R13 and D15 by the reporting units.

Methodological and quality deficits

- Data accuracy seems generally restricted. The high fluctuation of reported amounts indicates that the reporting and production system is not yet settled and does not produce stable results. One reason is the new **reporting system** that is in place since reference year 2006; introduction problems lead to partly very high amounts in 2006. In addition, conversion problems from litre / m³ into kg / tonnes are frequently mentioned as a problem and a reason for outliers.
- Problems exist with regard to the compatibility between the two used registers of the **Agency (SIRAPA)** and of the **Statistical Office**. Data evaluation / estimation has to be done on business level because the local units of both registers are not compatible. Compatibility shall be improved in the future.
- Facility register (treatment) is under development and completion is most probably not completed yet (2006). That's the reason for treatment quantities higher than capacity.

Breaks in time series

- The time serious of **hazardous waste generation** shows a peak in 2006: The figure is by the factor 2 higher than in previous and in the following year.
- **Hazardous waste generation** in **NACE B** dropped from about 140 kg/capita in 2004 and 2006 by about 94% to 8.7 kg/capita, which is still high compared to other countries. PT could no come up with a plausible explanation for this development, apart from the problem of

conversion from volume to weight.
Further action required • Nine answers to the validation questions are still pending. • Is a retrospective correction of the 2006 data for hazardous waste / waste oils feasible?

3.22 Romania

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE B (74%), NACE A (9%), NACE C (6%)
  - Hazardous waste: NACE C24-C25 (29%), NACE C19 (22%), NACE G-U (14%)
- Extreme influence of mining activities on total waste generation (see breaks).

Observations

- In the course of the validation RO made some retrospective changes for 2006 and 2004 generation and treatment data to remove breaks in the time series (**W09_X_0911_093 in A01-A02**; **W101 in G-U_X_G4677**). But there is still a big discrepancy between treatment and generation (e.g. W09_X_0911_093 in 2008; generation: 15 468 706 t; treatment: 199 085 t) which could not be explained.
- For **NACE A01-A02** the total waste quantity relative to the number of inhabitants (791 kg/capita; 17 031 kt) was high in 2008 when compared to other countries (average: 33 kg/capita), although the quantity 2006 was even higher (after the revision of "animal and vegetal wastes" from around 8 million tonnes to around 18 million tonnes in the course of the "evaluation 2008"). RO explained that, in 2008, about 80% of the waste was vegetal waste of which about 70% comes from agriculture and 30% from forestry. The respective amounts are determined on the basis of coefficients that are applied to production statistics. This model-based approach seems to lead to considerable overestimations.
- This question was answered with methodological details, but without any good explanation.
- There is a company with NACE code "Manufacture of pharmaceuticals" (**NACE C20-C22**) that, in 2008 generated waste classified as 17 05 03* (soil and stones with hazardous content) as a result of some remediation activities on-site. This waste was landfilled on its own landfill of hazardous waste. This caused **"contaminated soils and polluted dredging spoils" (12.6)** being the second most important hazardous waste in this category.
- For **NACE F** the total waste quantity relative to the value added (22.28 kg/1000 EUR) was high in 2008 when compared to the previous (reference) year. The reason was a change in the sample used in 2008, comparing with the one from 2006. The survey for 2006 included only very few companies with construction activities.
- For **incineration without energy recovery** there have been more incineration facilities in 2008 than in 2006. The incinerated quantities also increased for each facility (it is to be mentioned that both in 2006 and 2008 the facilities didn't operate at their designed capacity).
- For **recovery other than energy recovery** the specific requirements from waste legislation obliged companies to give more attention to waste recovery measures. At the same time, new recovery facilities were permitted.
- For **recovery excluding energy recovery** the quantities vary for metallic wastes (06), rubber wastes (07.3), plastic wastes (07.4) and wood wastes (07.5) according to real development. The decrease of the quantities **metallic** and **plastic waste** recycled in Romania is due to the fact that the quantities of such waste exported for recovery increased starting with 2004. For **wood waste** the increase of the recycled quantities is due to the fact that more facilities that recycle wood appeared in the last years (facilities that produce different types of panels and also workshops that produce small pieces of furniture).

Methodological and quality deficits

- For NACE A01-02, RO applies a model-based approach that seems to lead to considerable overestimations for animal and vegetal waste (EWC-Stat 09 (excl. 09.11 and 09.3)). As a result, RO reports by far the highest amounts of animal and vegetal waste for NACE A10-02 but also the highest overall total for this waste category.

- A majority of construction and demolition wastes is allocated to households and services instead of **NACE F**; waste generation in NACE F low compared to other countries.
- It seems that RO reported for 2004 and 2006 the specific composition of '**household and similar waste'** (W101) instead of the composition of the NACE category '**waste generated by households**' (Item 20). This seems to have changed for 2008.

Breaks in time series

- From 2006 to 2008, huge decrease of generation of non-hazardous **mineral waste** from coal extraction, due to the fact that some companies ceased their activity. The decrease affects the sectors **NACE B** and **NACE D** because one of large company with main NACE of electricity supply that used to have also some important mining activities.
- The **non-hazardous mineral waste** declined in RO since 2004 by approx. 200 Mio t. The treated quantities only by 48 Mio t between 2004 and 2008.
- In all NACE activities (especially in **NACE C19**), the **total quantity of hazardous waste** generated shows a significant and steady decline (in NACE 19 from 411 kt in 2004 to 115 kt in 2008). This is real development caused by structural changes in economic activity, compliance with BAT / BERF and on-site treatment of hazardous waste.
- Large increase of non-hazardous mineral waste in **Sector D** from 2004 to 2006; answer on request pending.
- RO reports for **household and similar waste** (10.1) a treated quantity in 2004 of only 31 kt. For 2006 and 2008, more realistic amounts of more than 4 million tonnes are reported. (The figure for 2006 was originally also low but has been retrospectively corrected.) The answer on the respective question is pending.

Further action required

- The difference of hazardous waste generated and treated (524 kt - 243 kt) was claimed to be managed under R12 - R 13 and D13 - D15 and it was also stored (as part of collection) on the generator's place. Thus, the total quantity of hazardous waste treated should increase in future due to storage.
- The methodological approach for the determination of waste generation in NACE A01-02 should urgently be discussed with RO.

3.23 Slovenia

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE C (34%), NACE F (27%), NACE HH (14%)
  - Hazardous waste: NACE G-U (32%), NACE C20-C22 (18%), NACE C24-C25 (17%)

Observations

- Variations in the waste generation by economic sectors mostly caused by "one-time cases" on account of the relatively small economy; i.e. closure or particularities in waste generation of larger business units.
- In **NACE G-U excl. G46.77** (Services (except wholesale of waste and scrap)), the total quantity of hazardous waste generated was by the factor 4 higher in 2008 than the value of the previous year. SI assumes that this is a one-time increase due to high amounts of dredged material generated in the process of remediation of a private industrial landfill. The erroneous inclusion of hazardous waste from households may also have contributed (see the following observation)
- In the sector **Households**, the **hazardous waste** total varies considerably over the years (2004: 0.7 kg/capita; 2006: 9.2 kg/capita; 2008: 2.9 kg/capita). The increase from 2004 to 2006 is partly explained by subsidies for the replacement of asbestos roofing. The decrease from 2006 to 2008 has methodological reasons (non-coverage of hazardous waste brought to landfills by private persons). These quantities were reported under NACE G-S (excl. 46.77).
- The **total amount treated** varies considerably over time due to improvements of the waste management infrastructure, the temporary storage of waste and waste imports/exports. In 2008, the treated total exceeded the generated total.
- **Recovery other than energy recovery** shows a high variation from 2004 to 2008. One reason is that the amount of recovery for 2004 is too high on account of methodological reasons (i.e. inclusion of a part of the internally recycled amounts). A correction is announced. The revision will significantly affect the treated totals. The data on waste generation will also have to be adapted.
- **Cross-checks** with other reporting obligations revealed inconsistencies for **discarded vehicles** / end-of-life vehicles, i.e. the ELV totals exceeded the total amount of discarded vehicles reported under the WStatR. SI stated that data sets are compiled by different institutions. A specific explanation for the discrepancies could not be provided.
- A **leather processing company** reported a waste the first time 2006. This is the reason for increased quantities in 2006.
- In **NACE C16** a company reported consistently data wrong by factor 1000 (EWL 03 01 05). (2006)

Methodological and quality deficits

- Many records in all datasets are flagged confidential (about 20% to 50%, depending on the dataset); this includes even “0” values.

Breaks in time series

- For **recovery other than energy recovery**, the total amount treated showed large fluctuations since 2004, which are due to a methodology change affecting data coverage. In 2004, SI excluded only quantities from data on recovery that were internally recovered by process R3, R4 and R5; while in 2006 and 2008 SI excluded the total internal recovery (R2-R11).

Further action required

- Some data corrections were announced for autumn 2011:
  - C16: correction of the high generated total in 2006 and the high hazardous waste total for 2004
  - Households: non-coverage of directly delivered hazardous waste from households
  - Retrospective correction of **recovery other than energy recovery** in 2004 (see breaks in time series) and the corresponding generation data.

3.24 Slovak Republic

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE C (39%), NACE HH (16%), NACE F (11%)
  - Hazardous waste: NACE C19 (26%), NACE C24-C25 (18%), NACE G-U (17%)

Observations

- In **NACE A01-A02 (Agriculture and forestry)**, the total quantity of hazardous waste generated per inhabitant (7.8 kg/capita; 42 199 tonnes) was high in 2008 relative to other countries (EU-27: 0.3 kg/capita). The amount has steadily increased and was in 2008 by factor 3 higher than in 2004.The high amount and the increase are almost entirely due to the increase of 'health care and biological wastes' (EWC-STAT 05) which accounts for between 78 % (2004) and 95 % (2008) of all hazardous waste in this sector. According to SK, an explanation could be that in 2008 a part of cattle herds had to be killed because of cattle plague
- For **NACE C19 (Manufacture of coke and refined petroleum products)**, the total waste quantity and the total quantity of hazardous waste generated were high when compared to 2006 and to other countries. The observed increase of hazardous waste in NACE 19 is largely caused by an increase of 'contaminated soils and polluted dredging spoils' (EWC-STAT 12.6), so that NACE C19 makes up 26 % of all hazardous waste in Slovakia 2008 (2006: 9%). SK did not come up with an explanation.
- Slovakia is the only country that reported **dredging spoils (11.3)** as its second most important non-hazardous waste category in **NACE C19** (Manufacture of coke and refined petroleum products). According to SK, the reason is that tailing rocks were reported as dredging spoils by one or several waste producers.
- For **NACE G-U excl. G46.77 (Services (except wholesale of waste and scrap))**, the total waste quantity relative to the number of inhabitants was high in 2006 compared to the previous and the following reference year. The reason is the high amount of dredging spoils (11.3) reported in 2006 (approx. 2500 kt compared to 9 kt in 2004 and 38 kt in 2008). The reported quantity amounted in 2006 to 81% of all dredging spoil reported and to 17% of the generated waste total. SK neither explained nor corrected the outlier.
- Data on **energy recovery** and **incineration** are not consistent for the waste categories household and similar waste (10.1) and for other incinerated waste. The explanation provided by SK, that in 2007 both Slovak incineration plants for household and similar wastes have got new permits for their activities with the change of character of the operation from "waste incineration" to "energy recovery", does explain the development from 2006 to 2008 but it doesn't help to understand the discrepancies between 2004 and 2006.
- The **cross-checks** with other reporting obligations revealed inconsistencies for **packaging waste (glass)** and for **discarded vehicles** that could not be explained.

Methodological and quality deficits

- Although the hazardous waste generation has not changed very much from 2004 to 2008, the data are unsteady in some sectors. Significant changes from 2006 to 2008 appear in both directions (increase and decrease). Some changes are explained in a general manner by high construction activities in 2006. However, the explanations are not very persuading. It is not unlikely that the sectoral variations have methodological reasons.
- Until 2008, SK used a specific waste treatment code (code "O") according to the Slovak legislative requirements that did not correspond to the European system of R and D codes. The "O" code was abolished in 2009. The use of this "O" activity until 2008 has caused differences in statistical data and was given as reason for the difference between generated and treated hazardous waste quantities. (Validation 2008)

Breaks in time series • n.a.
Further action required • SK should be asked again in the next validation round to check and explain the high amount of dredging spoil that was reported in sector NACE G-Q for the year 2006 (see section Observations) • One pending answer on a follow-up question on the correction of the hazardous waste figure for NACE C19 and one pending answer on the cross-check of glass packaging..

3.25 Finland

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE B (39%), NACE F (30%), NACE C (21 %)
  - Hazardous waste: NACE B (52%), NACE C24-C25 (27%), NACE E38/G46.77 (7%)
- FI reports a high specific waste generation in **NACE B Mining and quarrying** that originates mainly from the extraction and processing of non-ferrous metal ores (Cr, Zn, Cu, Ni). In 2008, FI reported after BG the second highest hazardous waste amount per capita which consists mainly of tailings from dressing processes
- On account of its strong timber industry, FI reports the highest waste totals and the highest hazardous totals of all countries for **NACE C16 (Manufacture of wood and of products of wood and cork)**. FI stated in 2006 that from sawing and veneer production more than half of timber used ends up into residuals. The high amount of hazardous waste results from the impregnation of wood. (Validation 2006)
- Finland has a strong paper industry and produces the highest hazardous and non-hazardous waste amounts of all countries in the sector **NACE C17-C18 (Manufacture of paper and paper products; printing and reproduction of recorded media).**
- In **NACE C24-C25 (Manufacture of basic metals and fabricated metal products)**, FI reports high amounts of hazardous waste relative to other countries. The reason is that some refining processes of mineral raw materials are located in the same facilities as the manufacturing processed of metals and metal products and are thus allocated to NACE C23-24. Only a few companies with high production capacities are responsible for the high hazardous waste total in this sector.

Observations

- In **NACE A01-A02 (Agriculture and forestry)**, the **total waste** quantity shows a strong and steady increase in recent years. Since 2004, the generated total in the sector has nearly doubled from 1.52 million tonnes to 2.74 million tonnes in 2008. The total increase is due to the continuously growing amounts of wood waste (7.5) which account for more than 90% of the waste total in the sector. In 2008, Finland reported the second highest waste total in this sector after Romania.
- At the same time, FI reported very low amounts of **hazardous waste** generated in **NACE A01-02** in 2006 and 2008. In the validation 2006, FI explained that hazardous waste from NACE A usually ends up in the separate collection from municipalities and services. Therefore, no separate data are available. FI did not explain how the significant amounts reported in 2004 were determined.
- In **NACE B**, the quantities of mineral waste generated increased significantly from about 20 million t to 30 million t between 2006 and 2008. This development is explained by fluctuations in the mining sector's activities and the opening of some new, huge surface mines with enormous surface soil excavation. (Quick evaluation 2008)
- For **NACE C20-C22 (Manufacture of chemical, pharmaceutical, rubber and plastic products)**, Finland has been reporting since 2004 constantly high waste totals compared to other countries (2008: 541 kg/capita; 2.86 million tonnes). The hazardous waste total which was also very high in 2004 and 2006 shows a strong decline in 2008.
- Finland was the only country that reported animal and vegetal wastes (09 not 9.11, 9.3) as its second most important non-hazardous waste category in **NACE D (Electricity, gas, steam and air conditioning supply)**. The reported amount (68 kg/capita; 361 168 tonnes) has sharply increased since 2006 and is by far the highest of all countries for this waste category in sector NACE D.
- In **NACE G-U excl. G46.77 (Services (except wholesale of waste and scrap))**, the total

quantity of hazardous waste generated per inhabitant (6.5 kg/capita; 34 403 tonnes) was 90% lower in 2008 than in the previous year. This decrease is mostly due to the drop of discarded vehicles (EWC-Stat 08.1) from 169 kt in 2006 to 0.3 kt (!) in 2008 (see also observation below).

- The ELV arising in 2008 (96 130 tonnes), as reported under the ELV- Directive, was much higher (by the factor 5) than the amount of **discarded vehicles** generated according to the WStatR (18 303 tonnes) in the same year. In addition, the amount of discarded vehicles generated in 2008 (18 303 tonnes) was much lower than the amount reported for the year 2006 (186 487 tonnes).
- For **NACE G46.77 (Wholesale of waste and scrap)**, the total waste quantity relative to the number of inhabitants (156 kg/capita; 828.7 kt) was high in 2008 when compared to other countries and compared to previous years (2004: 31.4 kt; 2006: 648.3 kt). The hazardous waste total in the sector shows also a strong increase compared to previous years.
- For **recovery other than energy recovery**, we see a strong increase of the total amount treated from 18.6 million tonnes in 2006 to 22.8 million tonnes in 2008. This is due to strong increases for the waste categories mineral wastes (12) (plus 4.2 million tonnes) and other recovered wastes (plus 5.6 million tonnes) from 2006 to 2008. On the other hand, the data show in the same period partly dramatic declines of recovered amounts for metallic wastes (6) (-1.2 million tonnes), wood wastes (7.5) (-4 million tonnes), paper and cardboard wastes (7.2) (-266 kt) and plastic wastes (7.4) (-98 kt).
- The **cross-checks** with other reporting obligations showed inconsistencies for **packaging waste** (plastics, metal packaging) and for **discarded vehicles**. In all cases, the WStatR values were low compared to the data from other sources.

Methodological and quality deficits

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Breaks in time series

- In **NACE F (Construction)**, the total quantity of hazardous waste amounted in 2004 and 2006 to about 400 kt and then suddenly dropped to only 1 kt in 2008. When looking in the data, we see that huge amounts of "contaminated soils and polluted dredging spoils" (12.6) were reported in 2004 and 2006, and that zero tonnes of this waste category were reported in 2008.

Further action required

- Finland is the only country that did not answer the validation questions.

3.26 Sweden

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE B (68%), NACE C (14%), NACE HH (5%)
  - Hazardous waste: NACE G-U (25%), NACE HH (17%), NACE C24-C25 (17%)
- The **mining sector (NACE B)** contributes 68 % of the total waste generation. Measured per capita, SE has the third highest waste arising in this sector after Bulgaria and Romania. In Sweden mining of ferrous ores and of copper and zinc containing ores is dominating. The metal contents in copper and zinc ores are around 0,5 % or lower which make large volumes of waste rocks and mine tailings. The biggest Zinc ore generates more than 20 millions of waste (waste rocks and mine tailings). The ferrous ores contain around 50 % metals, but since the iron ore mining is about 23 millions tonnes per year, the waste amount will be around 12 millions tonnes from the iron ores. There are about 18 major facilities in NACE B, which is relatively easy to survey by the annual environmental reports. There is hardly any adjustment upwards in this sector, and more than 95 % of the surveyed amount is actual amounts given from the environmental reports. The mines are also highly atomised so both the metal production, and the waste generation, per employee are relatively high. (Answer to validation request 2008).
- Sweden produces high waste amounts in the sector **NACE C17-C18 (Manufacture of paper and paper products; printing and reproduction of recorded media)** compared to other countries (second highest per capita amounts after Finland). About 86% of the sectoral waste total is generated in the sub-sector NACE 17.1 Manufacture of pulp, paper and paperboard, which has about 44% of the total employees in the sector. NACE 17.1 handles large volumes of virgin raw materials (wood), and since it is a modern process industry there is a high degree of automisation.

  The major waste types are bark wastes (from barking of wood) - classified as EWC-Stat 07.5 wood wastes, and different process wastes - mainly classified as EWC-Stat 07.2 paper and cardboard wastes. Also sludges from waste water purification on-site is generated in large amounts. NACE 17.1 in other counties is more based on waste paper as raw material which give lower waste quantities per employee and added value.

  The pulp and paper industry is an important exporting industry in Sweden. The total production of pulp and paper was about 11,6 millions tonnes (2008), and about 90 % is exported. (Answer to validation request 2008)
- In **NACE D (Electricity, gas, steam and air conditioning supply)**, Sweden a high hazardous waste total (25.6 kg/capita) relative to other countries. The major waste type in hazardous waste is fly ash and flue gas cleaning residues from waste incineration. In 2008 there were 31 municipal waste incinerators that used 2,293,000 tonnes of household waste and 2,273,000 tonnes of industrial wastes. These facilities reported 202 920 tonnes of fly ashes and flue gas cleaning residues, classified as hazardous wastes from combustion. The waste incineration sub sector is more waste intensive than other sub sectors in the energy sector (e.g. more waste per MWh produced heat or electricity). (Validation 2008)

Observations

- In the sector **households**, Sweden reports a high hazardous waste total (38.0 kg/capita; 348 748 tonnes) and a high percentage of hazardous waste (7.9%). Sweden explained this observation with the allocation of high amounts of discarded vehicles (160,000 tonnes) and discarded equipment (142,000 tonnes) to this sector. This explanation does not consider the considerable amounts of other hazardous wastes reported, like combustion waste, contaminated soil, chemical deposits and others. (Answer to validation request 2008)
- In **NACE G-U excl. G46.77 (Services (except wholesale of waste and scrap))**, the percentage of hazardous waste (38.5%; 508 612 tonnes) relative to the total waste in the

sector was high in 2008 compared to other countries (average: 8.6%). According to Sweden, the reasons are high amounts of contaminated soils from enterprises and authorities in the service sector and hazardous waste types generated in harbours (water from oil separators, contaminated ballast water). (Validation 2008)

- In **NACE F (Construction)** Sweden reported in 2008 a relatively high share of hazardous waste which is rather due to the low amount of non-hazardous C&D waste than to the hazardous waste amount which is close to the EU-27 average (Validation 2008). In addition, the hazardous waste generation varies considerably between 2004 and 2008. One reason could be the change of methodology (for details please refer to the quality reports).

Methodological and quality deficits

- In 2008, Sweden adjusted the reclassified considerable amounts of wood waste (07.5) generated in NACE 16, and animal and vegetal waste (09 excl. 0911 and 09.3) generated in NACE A01-02 as by-products. The reductions amounted to minus 17.6 million tonnes or 99% of wood waste and minus 3 million tonnes of animal/vegetal waste. The comparability with similar countries like Finland might have suffered from the reclassification.
- In some sectors the representativeness of the data seems limited due to the low sample size used as basis for grossing up. Examples are: data on hazardous construction waste (data from one region representing 7% of the population were grossed up); data on hazardous waste in NACE G-U (sample survey on transporters with a raising factor of 6).
- Cross-checks with data on packaging waste revealed inconsistencies for the materials plastics and glass. In both cases, the recovered packaging waste amounts exceeded the respective material totals reported under the WStatR. The reasons are unknown.

Breaks in time series

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Further action required

- Announced some improvements regarding waste classification of discarded equipment and the comparability to glass and plastic packaging data.

3.27 United Kingdom

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE F (30%), NACE B (26%), NACE E38, G46.77 (14%)
  - Hazardous waste: NACE G-U (29%), NACE F (17%), NACE E38, G46.77 (13%)

Observations

- For all three reference years, UK reported the highest share of hazardous waste for the sector **NACE A01-02** (around 60% or even higher). The data are confirmed by the DEFRA. Background information: UK uses a specific model for determining waste generation in the agricultural sector, the accuracy of which is hampered due to limited reliable data and variations in farming practice. The largest element of the reported hazardous waste is sheep dip (liquid formulation of insecticide and fungicide which shepherds and farmers may use to protect their sheep from infestation against external parasites).
- In 2004, UK reported huge amounts of **mixed and undifferentiated wastes** (30.5 million t of 511 kg/cap), which was the second highest arising of all countries after Iceland. Since 2004, these amounts have decreased by 26 million t or 86%.
  - In 2004 high amounts were reported in the sectors **NACE E38 and G46.77**. the following decrease by about 23 million tonnes resulted from methodological improvements, i.e. the use of output data from waste treatment facilities instead of estimations based on input data.
  - In **NACE F**, data on mixed and undifferentiated wastes show a high variation on account of methodological changes and misclassifications. In 2004, no data were reported for category 10.2. For 2006, an amount of nearly 4 million tonnes was reported which resulted most likely from the misclassification of gypsum-based materials and insulation materials as mixed waste. The quantity reported in 2008 was by 3 million tonnes or 39% lower than in the previous year. In the course of the validation 2006, UK offered to retrospectively adjust the data. It seems that Eurostat did not make use of this offer.
- UK constantly reports a high waste arising for the sectors **NACE E38 and G46.77**. For NACE G46.77, the reported amounts of total waste and of hazardous waste are the highest of all countries. Especially high amounts are reported for **metal waste** (second highest per-capita amount after EE). The reason is most likely the way of allocation to the generating sectors, i.e. the general allocation of treatment outputs to sectors E38 and G46.77, in combination with double-counting of waste (primary and secondary waste). The two sectors are excluded from the commercial and industrial waste survey. All output tonnages from waste management facilities were allocated either to NACE 38 or to NACE G46.77 for more detail see QR. (Validation 2008; Quality report)
- The significant reduction of the total waste generated in **NACE C24-25** is most likely due the reclassification of blast furnace slag as a by-product. The amount of non-hazardous combustion waste decreased by 3.2 million tonnes from 2004 to 2006. (Validation 2004/2006)
- The time series for the arising of **discarded vehicles** shows a high variation due to methodological reasons.
  - In 2004, UK reported nearly the whole amount of discarded vehicles as non-hazardous waste secondary waste.
  - As of 2006, vehicles are reported as hazardous primary waste and as non-hazardous secondary waste. As a result, the total amount increased by only 8% but the ratio hazardous / non-hazardous and the allocation to the generation sectors changed dramatically (e.g. increase of hazardous waste from households by 1.1 million tonnes).
  - From 2006 to 2008 the total amount dropped by 1.1 million tonnes or 39% because of a change of methodology / data source. In 2008, new data on ELVs covered by the ELV

Directive became available from Department for Business, Innovation and Skills (BIS). The data collected under the Directive is the most up-to-date and accurate data available and preferable to vehicle registration data that were used before. (Validation 2006 and 2008) In the course of the validation 2006, UK offered to retrospectively adjust the data. It seems that Eurostat did not make use of this offer.

- Since 2004, the generated **hazardous waste total** has always been considerably higher than the total hazardous waste treated. The difference cannot be explained by imports and exports of hazardous waste. One reason is probably the change of nature through pre-treatment. The considerable amounts of hazardous ELV reported under generation will contribute to this as they are not reported as hazardous waste on the treatment side.
- The increase of **recovery other than energy recovery** from 2006 to 2008 by about 30% is assumed to be at least partly due to the improved and more complete data. The data for 2008 included estimates for waste treated by facilities that are exempt from licensing and reporting.
- **Recovery excluding energy recovery** of plastics waste in the UK has decreased since 2004 by about 1.2 million tonnes. One reason is that, according to the packaging waste data, the exports of plastics packaging waste has increased considerably.
- Concerning **waste incineration**, UK has reallocated the incinerated waste amounts between 2004 and 2006 by moving more than 3 million tonnes from energy recovery (2004: 4 052 kt; 2006: 41 kt) to incineration (2004: 1 333 kt; 2006: 4 832 kt). Since 2006, classification was done on the basis of the main purpose of the incineration facility. The data for 2008 are consistent with the allocation in 2006. A retrospective correction might be considered once the effects of the application of the energy efficiency criteria are clear.
- In 2004, UK reports that about 25 million tonnes of mixed and undifferentiated wastes are **disposed of at landfills**. This amount basically vanished in 2006 although the total amount of waste disposed of did not significantly change. It is unclear which waste types were covered by this category.

Methodological and quality deficits

- Data are compiled in a “multi-country environment” with all connected problems like different methodological approaches, possible double-counts, etc..
- In addition, UK works with a patchwork of methodologies some of which are still subject to change. Several of the observations listed above illustrate the impact of methodological changes on the data.
- Data collection relies partly on voluntary reporting.

Breaks in time series

- n.a.

Further action required

- In the course of validation of the 2006-data, UK offered **retrospective corrections** in several cases (e.g. for the waste categories “discarded vehicles” and “mixed and undifferentiated waste”). It seems that Eurostat did not react.
- **Asbestos roof sheets** arising in **sector NACE A01-02** have repeatedly been misclassified as "solidified, stabilised or vitrified wastes" (EWC-Stat 13) waste. This should be done correctly in the next reporting round
- In NACE **A01-02**, Fish waste disposed of at sea was in 2008 allocated to EWC-STAT 9.11, in 2004 and 2006 to category 09. This should eventually be corrected in the course of the next reporting round
- The reasons for the high metal waste amounts should be investigated more closely.

3.28 Croatia

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE C (41%), NACE E38, G46.77 (39%), NACE E (10%)
  - Hazardous waste: NACE C26-C30 (86%), NACE C16 (3%), NACE C24- C25 (3%)
-

Observations

- HR reported zero amounts in the sectors **households** and **NACE G46.77** (Wholesale of waste and scrap). For households there is absolutely no data, while for G46.77 there is only data for 2004. Regards to changing of NACE Rev 1.1 to NACE Rev.2 this 2 groups were not covered but will be next time.
- Croatia is the only country that reported **"solidified, stabilised or vitrified wastes**" (13) as its most important hazardous waste category in **NACE B** (Mining and quarrying). This seems to be real development but could not be explained.
- Croatia is the only country that reported "**discarded vehicles" (08.1)** as its most important hazardous waste category in **NACE C19** (Manufacture of coke and refined petroleum products). This seems to be real development but could not be explained.
- In **NACE C26-C30**, the total quantity of hazardous waste generated per inhabitant (44 kg/capita; 196 kt) was high in 2008 relative to other countries (average: 3.5 kg/capita). Also the percentage of hazardous waste (74%) relative to the total waste in the sector was high in 2008 compared to other countries (average: 11%). This seems to be real development but could not be explained.
- Croatia is the only country that reported "**mineral wastes" (12.1 to 12.5 not 12.4)** as its most important hazardous waste category in **NACE C26-C30**. This seems to be real development but could not be explained.
- HR reported a much lower quantity of hazardous waste **(HW) treated** (18 kt) than the quantity of **HW generated** (228 kt) in 2008. This higher quantity was explained trough confidentially of certain values.

Methodological and quality deficits

- No data 2006, were sent in wrong format.

Breaks in time series

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Further action required

- Ask HR to re-send 2006 data in correct format.

3.29 FYROM

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: all waste reported in NACE C (100%)
  - Hazardous waste: all hazardous waste reported in NACE C: C24-C25 (71%), C26-C30 (18%), C23 (9%)

Observations

- For most sub-sectors of **NACE C**, the reported totals are within the ranges of the values observed for other countries except for **NACE C24-C25**, where the values were high compared to other countries. The value was confirmed in the course of the request. As reason it was mentioned that the particularity is due to the value reported by one larger company.
- Some potential misclassifications were detected. However, the importance of waste types unusual in comparison to other countries was mostly plausible on account of the small country size and the fact that values reported by larger companies thus have a large influence on the whole countries' dataset.

Methodological and quality deficits

- All data except for **NACE C** are missing.
- 2008 was the first reporting year; no analysis of time series possible.

Breaks in time series

- -

Further action required

- -

3.30 Turkey

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE HH (44%), NACE D (39%), NACE C (16%)
  - Hazardous waste: NACE C20-C22 (37%), NACE C24-C25 (35%), NACE C23 (7%)
- Main waste generating sectors largely biased by missing data (see below).

Observations

- Many sectors missing in the data sets on waste generation of all years. Affected sectors: **NACE A01_A02, NACE A03, NACE B, NACE E36_E37_E39, NACE F, NACE G4677**.
- Some sectors missing in certain annual datasets: **NACE C (2006), NACE E38 (2004, 2006), NACE G-U_X_G4677 (2006, 2008)**
- For **recovery other than energy recovery**, the total amount treated in 2008 (14 632 kt) was by the factor 10 higher than the amount reported 2006 (1 464 kt), but only by factor 1.5 higher than 2004 (9.6 million tonnes). The reason is that '"in 2006 the manufacturing industry was not included" (ARGUS: In 2004, this sector generated 2 million tonnes metallic wastes and animal and vegetal wastes which "disappeared" in 2006, causing the drops in waste generation and waste treatment data!)

Methodological and quality deficits

- Surveys on manufacturing industries (**NACE C**) only conducted in 2004 and 2008, thus all data on NACE C missing in 2006.
- In addition, different coverage of survey on the data for the manufacturing industry as follows: In the survey 2004, the coverage was 80% by value added of establishments with 10 or more employees; in 2008, the survey covered all establishments with 50 or more employees.

Breaks in time series

- Break 2006 due to missing data of NACE C, NACE 38 and NACE G-U_X_G4677.

Further action required

- Two pending issues regarding PCB-waste from NACE C16

3.31 Iceland

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: n.a.
  - Hazardous waste: n.a.

Observations

- -

Methodological and quality deficits

- No data 2006 and 2008.

Breaks in time series

- -

Further action required

- -

3.32 Liechtenstein

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE E (49%), NACE E38/G46.77 (14%), NACE C (10%)
  - Hazardous waste: NACE C26-C30 (57%), NACE E38/G46.77 (14%)
- Main sectors with regard to employment: Services (NACE G-U except G4677), NACE C26-C30 and NACE F.

Observations

- No data for services sector (**NACE G-U except G4677**) and **NACE F** although one would expect the highest values there.
- Low values in **NACE C26-C30** despite importance in terms of employment (no value added statistics available)
- No data for households.

Methodological and quality deficits

- 2008 first reporting year; no analysis of time series possible;
- LI submitted no quality report.

Breaks in time series

-

Further action required

- Three pending issues regarding waste treatment (software needs to be checked first before the answer can be provided)

3.33 Norway

Structural characteristics (economy, geography, ..)

- Main waste generating sectors:
  - Total waste: NACE C (35%), NACE HH (23%), NACE G-U (16%)
  - Hazardous waste: NACE G-U (22%), NACE C24-C25 (21%), NACE C20-C22 (19%)
- NO reports high amounts of waste in NACE A03 compared to other countries. The absolute amounts are however low (121 kt or 1.2% of the generated national total in 2008). The major part of the waste is from EWC-Stat-code 09.11, of which about 1/3 is from fish farming and the remaining from fishing.
- NO reports very high amounts of waste in NACE B compared to other countries. NO is one of the biggest exporter of oil and gas worldwide.

Observations

- In **NACE C19 (Manufacture of coke and refined petroleum products)**, the hazardous waste generated in 2008 was by the factor 25 higher than in the previous year. This increase is due to the reporting of one enterprise which was either reclassified from NACE B to NACE C19, or the hazardous waste was reported in the wrong establishment of the enterprise. (Validation 2008)
- In **NACE C20-C22 (Manufacture of chemical, pharmaceutical, rubber and plastic products)**, NO is reporting high hazardous waste totals compared to other countries since 2004. Most of this waste comes from one company; more detailed information is not available. (Validation 2008)
- NO is the only country that reported discarded equipment as its most important non-hazardous waste in the sector **NACE E38** in 2008. The reasons are the inclusion of other vehicles and the reporting of secondary waste. (Validation 2008)
- The reclassification of discarded vehicles and discarded equipment from non-hazardous to hazardous waste in 2006 resulted in a considerable increase of the hazardous waste total in the sector **households**. As a result, NO reports the second highest hazardous waste amount per capita in this sector after Sweden. (Validation 2008)
- Since 2006, NO has been reporting by far the highest arising of **discarded equipment** of all countries (130 kg/capita in 2008). This is much higher than the amount of WEEE collected reported by NO according to the WEEE Directive (24 kg/capita). The main reasons for the high amounts and the discrepancies are that 1.) NO includes in this category all vehicles that do not fall under definition of the ELV, and 2.) the double reporting as primary and secondary waste since 2006. (Validation 2008)
- NO reports astonishingly low amounts of **mineral wastes** compared to other countries. The reasons for this are unknown. The reason might be that waste accounts in NO do not cover “clean masses of stones, gravels, soil and other materials, which readily my be brought back into the natural cycle of the ecosystems”, as described in the quality report. (Validation 2008)
- For **energy recovery**, the total amount treated in 2008 (2091 kt) was by factor 1.3 higher than the capacity reported for the same treatment category (1555 kt). The reason is that the figures on treatment capacity do not include co-incineration plants for pure wood and bio-mass waste, while the figures on treated amount do. (Validation 2008).
- The cross-check with the **packaging waste** data showed discrepancies for the recovery of plastic packaging waste. The plastic packaging recovered within NO (68kt) in 2008 clearly exceeded the total plastic waste recovered (40kt). (The difference corresponds roughly to the amount of plastic packaging waste imported by NO (30 kt). (Validation 2008)

Methodological and quality deficits

- The Norwegian approach to compile waste statistics is extremely complicated, e.g. because

NO draws on many different sources. Accordingly, it is difficult to extract concise information.

- From 2004 to 2006, NO changed the methodology for reporting on discarded vehicles and discarded equipment as follows:
  - The primary waste of discarded equipment and vehicles was reclassified from non-hazardous waste to hazardous waste.
  - Secondary waste which was not included before, has been reported as non-hazardous waste in the sectors E38 and G46.77 since then.
  - NO reports under waste category 08.2 only those vehicles that fall under the definition of the “end-of-life vehicles” according to the ELV-Directive (i.e. M1 or N1 only, limited to 8 persons + driver or to 3.5 tonnes load). Other vehicles (trucks, tractors, buses, trailers, ..) are reported as discarded equipment.

  This change of methodology has led to breaks in time series for the hazardous waste total and for some sectors (see section breaks). In addition, the chosen methodology results in several peculiarities compared to other countries.
- As of 2006, NO includes secondary waste in their statistics. Before 2006, slag from waste incineration was the only secondary waste reported.
- As of 2006, waste that was used as cover material for landfilling has been reallocated from the treatment category landfilling to recovery.
- The total amount incinerated without energy recovery is per definition not comparable with the respective capacities for waste incineration. In the figures on treatment capacity the incineration plants are classified as either an energy recovery plant or an incineration plant. In the figures on treated amount the total combusted amount at each plant is split between energy recovery and incineration according to the plant's energy recovery rate.
- NO uses a national standard for waste classification (NS 9431). A conversion table for hazardous waste between NS 9431 and the EWC-Stat is included in Annex ! of the quality report 2008.

Breaks in time series

- The hazardous waste total has increased from 2004 to 2006 by 548 kt (82%), mainly due to the reclassification of primary waste from discarded vehicles and equipment from non-hazardous waste to hazardous waste (increase by 396 kt). In addition, there is an increase in the amount of hazardous waste in the established national registration system for hazardous waste.
- The generated waste total has increased from 2004 to 2006 by 2.5 million tonnes (33%) which is at least partly due to the integration of data on secondary waste.

Further action required

- The reporting on discarded vehicles (limitation of category 08.1 to ELV according to the definition of the ELV-Directive) does not comply with the definition of the EWC-Stat-category. This issue should be discussed with NO before the next reporting round.

4 Conclusions and outlook

In the following, the main conclusions from the in-depth validation are briefly summarised. They also contain proposals on how to improve the upcoming validation and other issues.

In the next validation of the WStatR data 2010, the following issues should be considered:

- The types of checks based on indicators calculated with the value added did not show an advantage over those related to employees and can therefore be used only as additional information next time; with regard to the identification of possible errors it can be disregarded;
- Instead, we recommend the following additional efforts regarding checks:
  - Additional checks on the basis of waste categories should be integrated, e.g. checks of time series by EWC-Stat categories or selected aggregates;
  - Clear filter criteria such as absolute changes should be found to limit the number of possible errors, as many could be identified as not relevant;
  - Instead of or in addition to the checks on misclassifications, the average shares of waste categories from the sectoral totals could be determined for the EU 27 and compared to the shares on country level; large deviations could then be investigated further;
  - Increasing focus should be laid on the assessment of time-series, as this approach clearly used to be more helpful in the current validation than the mere comparison to the previous year; a possible statistical approach could be the analysis of trends (coefficient of determination of the line of best fit);
  - Particular attention should be laid on the issue of zero, missing and very low values, as these are often not detected as outliers in the statistical checks applied;
  - The comparison of waste generation and treatment on the basis of selected[1] waste categories, as the revision of the WstatR establishes the same breakdown by waste categories for data on treatment (Annex II) as for generation (Annex I).

Apart from the direct improvements of the in-depth-validation of the data, some aspects might as well be beneficiary to the validation process. Such aspects include:

- Improvement of the quality reports by adding a self-assessment of data changes over time and a section changes since last reporting to the existing report template (see Austria).
- It would be helpful to use the validation results by country (see chapter 3) as basis for the compilation of country profiles and to update these regularly in future.
- It could be useful to spend some effort in an investigation of the coverage of EU27 aggregates, i.e. how many countries are actually represented, how many have provided no data or zero values and what is the level of completeness of the various aggregates.
- It would be useful, if Eurostat could also hand over some results of the technical checks, particularly the information on inconsistent sums and missing values.

We recommend to follow the recommendations regarding the follow-up requirements mentioned in the country summaries in chapter 3. An appropriate follow-up will be crucial to fully benefit from country consultation conducted in the course of the in-depth validation of the 2008 data as described in this report.

[1] As the pre-treatment often changes the classification of waste, suitable waste categories need to be selected for this test, as many waste categories generated will not turn up in the figures on treatment, because these data do not cover pre-treatment.

Annex 1 - Validation overview by country

See file " *Annex1 Validation overview by country.pdf* "

Table 4 Abbreviations used for affected waste types in the overview tables.

EWC-Stat	Waste description
1.1	Spent solvents
1.2	Acid, alkaline or saline wastes
1.3	Used oils
1.4	Spent chemical catalysts
2	Chemical preparation wastes
3.1	Chemical deposits and residues
3.2	Industrial effluent sludges
5	Health care and biological wastes
6	Metallic wastes
7.1	Glass wastes
7.2	Paper and cardboard wastes
7.3	Rubber wastes
7.4	Plastic wastes
7.5	Wood wastes
7.6	Textile wastes
7.7	Waste containing PCB
8	Discarded equipment (excluding discarded vehicles and batteries and accumulators waste)
8.1	Discarded vehicles
9	Animal and vegetal wastes (excluding animal waste of food preparation and products; and animal faeces, urine and manure)
9.11	Animal waste of food preparation and products
9.3	Animal faeces, urine and manure
10.1	Household and similar wastes
10.2	Mixed and undifferentiated materials
10.3	Sorting residues
11	Common sludges (excluding dredging spoils)
11.3	Dredging spoils
12	Mineral wastes (excluding combustion wastes contaminated soils and polluted dredging spoils)
12.4	Combustion wastes
12.6	Contaminated soils and polluted dredging spoils
13	Solidified, stabilised or vitrified wastes
tt	Total Waste

Comments on the data availability: Fields marked with red or blue shading indicate cases were the tests could not be performed due to missing data. As all tests are based on the comparison of the target-values with reference values and often indicators (e.g. waste data related to economic data) are used for comparison, they mostly require several valid values of the data involved. The comparison of the total waste with that of the previous reporting based on employees, for instance, requires four valid data values, i.e. the two waste amounts 2008 and 2006 as well as the two employment numbers of 2008 and 2006.

All required data were in tested for availability. But in order to keep the overview tables better readable, the presentation is limited to two categories which can be interpreted as follows:

- waste data missing: describes all cases where the target waste value or the reference waste value was missing (or zero, when in case of ratios, the denominator was affected). It is possible that the associated economic data was also not available, but this was not differentiated in the tables
- economic data missing: describes all cases where all required waste data was available but the test could not be performed due to the lack of economic data, i.e. the indicators required for the test could not be calculated (again, zeros were seen as missing, because the economic value was always used as denominator).

Annex 2 - Validation requests by country

See file " *Annex2 Validation requests by country.pdf* "

Comments: For several questions, a follow-up is required, either because they were not answered, or for other reasons mentioned in chapter 2.4. These cases are highlighted in the document in red font.

Annex 3 – Approach regarding the reporting of household and similar waste / recyclables in activity households

In the validation 2004, the check of the composition of waste from households by waste categories revealed that the countries use different approaches for the allocation of waste amounts by the waste categories concerning household and similar waste and the (separately collected) recyclables. These different approaches hamper the comparibilty across countries and bias the data on separate collected fractions.

For this reason, the composition of waste from housholds was thoroughly checked for the whole time series and all countries in the course of the validation.

The following table shows all countries which applied the approach in any of the three reference years. All other countries applied the (correct) waste management approach.

Table 5 Application of the material flux approach for recyclables by countries and year.

MF aproach applied in	2004	2006	2008
Romania	Yes	Yes	No
Cyprus	Yes	Yes	Yes
Ireland	Yes	Yes	no data