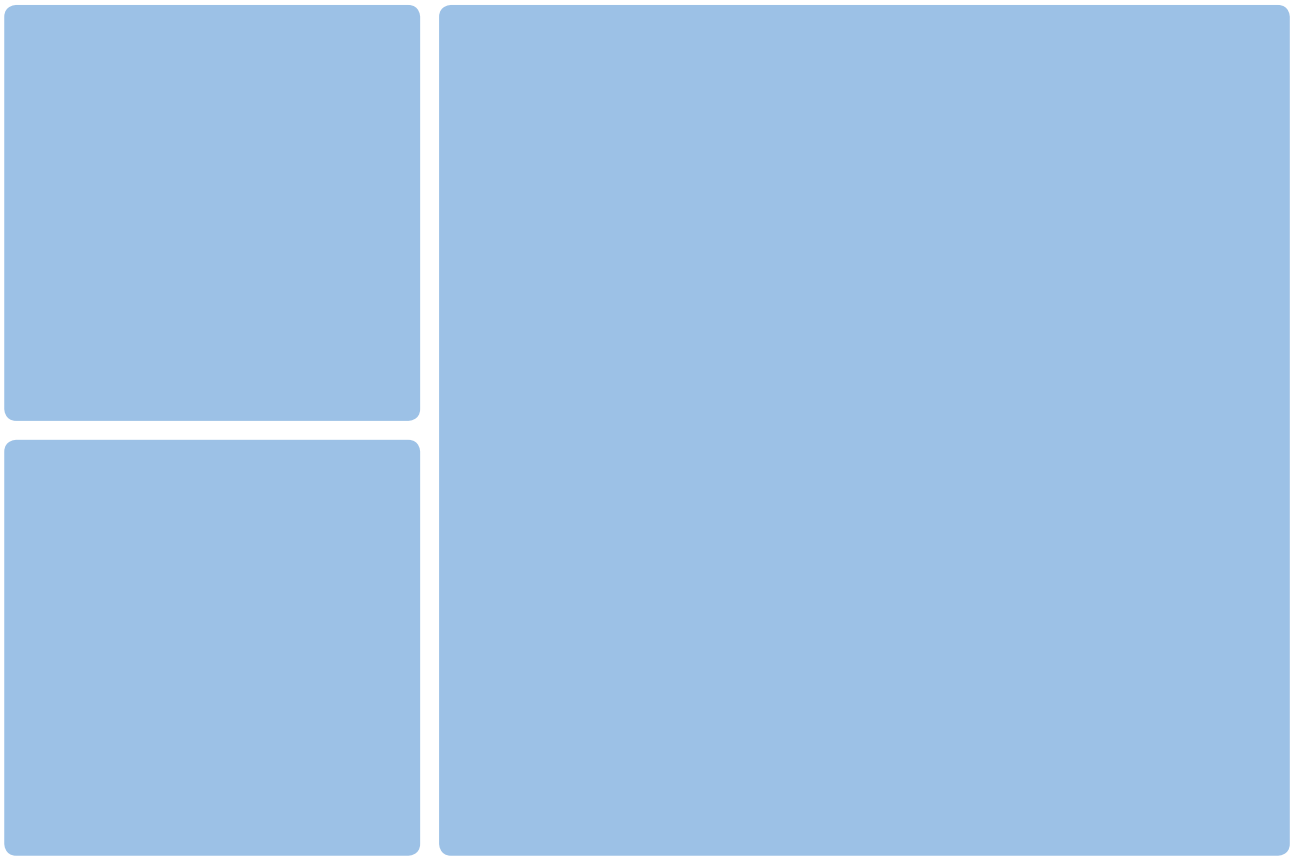
NATUR VÅRDS VERKET

Quality Report

For statistics on generation of waste and recovery and disposal of waste in Sweden 2006

REPORT 5842 • JUNE 2008



Quality Report

For statistics on generation of waste and recovery and disposal of waste in Sweden 2006

According to EU Regulation on Waste Statistics 2008

SMED at the request of
SWEDISH ENVIRONMENTAL
PROTECTION AGENCY

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ISBN 978-91-620-5842-5 .pdf
ISSN 0282-7298

Elekrtonisk publikation

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Introduction and guidelines

General information on the EU Waste Statistics Regulation

The Regulation of the European Parliament and the Council No 2150/2002 of 25 November 2002 on waste statistics (hereafter referred to as "the Waste Statistics Regulation" or "WStatR") contains rules for the reporting of waste statistics to the EU[1]. Reporting in accordance with the regulation is to take place every second year. Reporting shall be submitted each time 18 months after the end of the reporting period. The first round of reporting by all member states was completed by 30 June 2006 and concerned waste generation and recovery and disposal of waste during 2004. This quality report is part of the obligation to report by no later than 30 June 2008 and concerns the generation and treatment of waste in Sweden during 2006.

The regulation contains three annexes that describe in more detail what should be reported:

Annex I

The generated quantities of waste are to be reported for a total of 20 different sectors including

- all economic activities (sections A-Q according to NACE Rev.1 or SNI 2002)
- waste arising from recovery and/or disposal operations
- waste generated by households.

The generation of waste for these 20 sectors should be given according to the EWC-Stat waste classification. EWC-Stat is a special material-based waste classification that is founded on the usual list of waste. There are a total of 48 different categories of waste in EWC-Stat.

Annex II

The treatment of waste is to be reported by treatment method for the different types of waste according to EWC-Stat and broken down by region according to NUTS 1. Up to and including 2007, Sweden comprised one NUTS 1 region. From 2008, Sweden is now divided into three NUTS 1 regions. In this survey we have we have invented waste treatment according to the earlier NUTS classification, that is with Sweden as one NUTS 1 region.

[1] An "EU regulation" implies that the legislation is immediately applicable in all member states (in contrast to a directive which becomes applicable in every member state only once it has been incorporated into the country's own legislation).

The method of treatment relates to various recovery and disposal operations[2] ("R and D codes") have been compiled into 5 different groups:

1) Incineration: Main use as fuel or other methods of generating energy
2) Incineration: Incineration on land
3) Recovery excluding energy recovery
4) Disposal operations: Land filling, deep injection, surface impoundment, permanent storage and others
5) Disposal operations: land treatment, release into water

Some recovery and disposal operations that constitute pre-treatment should not be reported.

According to Annex II, the number of treatment facilities and the capacity for different treatments should also be reported regionally according to NUTS 2 (i.e. 8 aggregates of counties for Sweden)[3].

Annex III presents a division of the types of waste according to EWC-Stat. The original Annex III has been revised .

Report description

The following report constitutes one part of the obligatory delivery to the EU. According to the waste statistics regulation, every member state should submit a report on the coverage and quality of the statistics. The report is also published in Sweden in Swedish for Swedish users of statistics. The contents and structure of the report have been determined by the European Commission in a specific regulation . The report is structured in conformity with this regulation[4].

The report is divided into three parts:

- **Part 1**: This part contains primarily
  - General information, for example, on the responsibility and organisation of the reporting
  - General description of the methods used. An overview is presented of how the statistics have been compiled.
- **Part II**: Quality attributes. This part includes a description of the various aspects that affect the quality of the produced data, in particular, in relation to Section 2 Accuracy. The headings are taken from the European Commission's regulation on the contents of quality reports.
- **Appendices to Part II**: This part contains a more detailed description of the most important quality attributes of the survey.

[2] Processes for recovery and disposal are defined in Annexes 4 and 5 of the Swedish Waste Ordinance (2001:1063) and in Annexes IIA and IIB of the EU Framework Directive on Waste (1975/442/EEC). The different recovery processes are classified as R1 to R13 (R stands for *Recovery*) and there are different disposal processes classified as D1 to D16 (D stands for *Disposal*).

[3] COMMISSION REGULATION (EC) No 574/2004 of 23 February 2004 amending Annexes I and III to Regulation (EC) No 2150/2002 of the European Parliament and of the Council on waste statistics

[4] COMMISSION REGULATION (EC) No 1445/2005 of 5 September 2005, defining the proper quality evaluation criteria and the contents of the quality reports for waste statistics for the purposes of Regulation (EC) No 2150/2002 of the European Parliament and of the Council

Part I: Description of the data

This part deals first with some obligatory formal details. This is followed by a general description of the methods used to compile the data.

Identification

Country: Sweden
Reference year: 2006
Datasets:
waste_regio_a2_se_2006_0000
waste_recov_a2_se_2006_0000
waste_dispo_a2_se_2006_0000
waste_incin_a2_se_2006_0000
waste_gener_a2_se_2006_0000

Transmission date: 17 June 2008

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Organisation of reporting

There are a number of laws and regulations governing the work with waste statistics. The European Union's waste statistics regulation (WStatR) relates directly to this as well as the Swedish Official Statistics Act and Ordinance[5]. The waste statistics regulation governs the content, reporting frequency and format of the statistics to be reported to the EU. The Swedish Ordinance on official statistics allocates responsibility for the official statistics on waste to the Swedish Environmental Protection Agency as well as the right of decision-making on the scope and content of the statistics.

Adjacent legislation and conventions that primarily indirectly govern the responsibility of the Swedish Environmental Protection Agency relating to statistics production and reporting include the Secrecy Act[6], Personal Data Act[7], Ordinance concerning government authorities' collection of data[8] and the SimpLex Ordinance[9], but also the Århus Convention[10] regarding data on emissions. According

[5] Official Statistics Act (2001:99) and Ordinance (2001:100) on official statistics
[6] Secrecy Act (1980: 100) and the Secrecy Ordinance 1980
[7] Personal Data Act (1998:204)
[8] SFS 1982:668
[9] SimpLex ordinance SFS 1998:1820, Ordinance on individual analysis of consequences of the effect of legislation on conditions for small enterprises
[10] Århus Convention Ds 2004:29

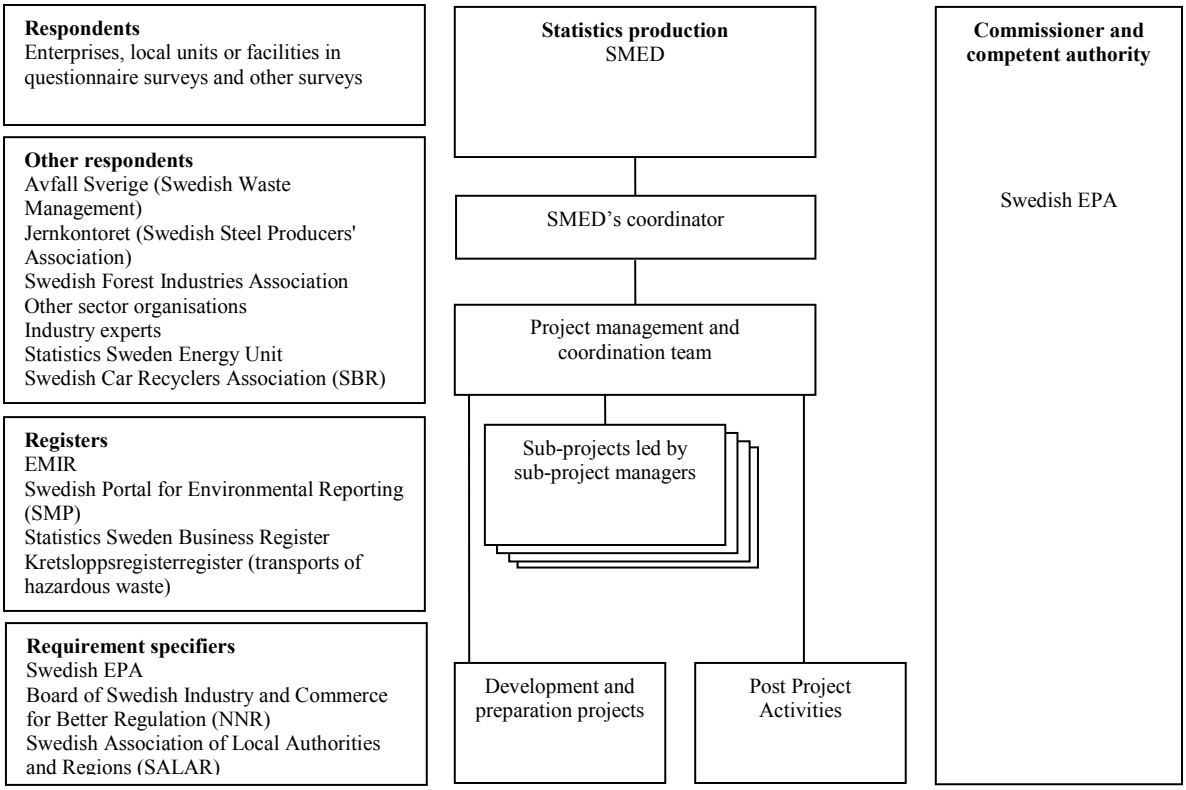
to the Århus Convention, data on emissions should not be confidential. Where the dividing line is between the Århus Convention's public access and the Secrecy Act's requirement for confidentiality as regards data that forms the basis of statistics is currently under review. Enterprises' obligations to document waste management for the purposes of environmental protection are primarily governed by the Environmental Code[11] and the Waste Ordinance[12], the Ordinance Concerning Environmentally Hazardous Activities and the Protection of Public Health[13], and others.

In addition to these, there are several other directives and ordinances in the field of waste that govern Sweden's commitments regarding international reporting, including statistics and data on waste[14].

In Sweden, the Swedish Environmental Protection Agency is responsible for producing, publishing and reporting national waste statistics. The Swedish Environmental Protection Agency has a framework agreement with the SMED consortium (Swedish Methodology for Environmental Data)[15] for the provision of services regarding data collection, statistics production and the development of methodology for reporting activities. The waste statistics with accompanying documentation have been produced by SMED.

[11] Environmental Code 1998:808
[12] Waste Ordinance (2001:1063)
[13] Ordinance on environmentally harmful operations and health protection (1998:899)
[14] How to produce better and cheaper waste statistics? Preliminary study on Swedish reporting systems for waste data, Swedish Environmental Protection Agency, Report 5530: Dec 2005.
[15] The consortium consists of the Swedish Environmental Research Institute (IVL), Statistics Sweden, the Swedish University of Agricultural Sciences (SLU) and the Swedish Meteorological and Hydrological Institute (SMHI)

In preparation for the current reporting, the work has been organised as follows:



For the reporting according to the waste statistics regulation, a quality system has been developed covering the areas of responsibility for SMED[16] and the Swedish Environmental Protection Agency[17]. This ensures the possibility to repeat and trace the work carried out.

General description of methods used

The statistics on the generation of waste and the recovery and disposal of waste are based on a comprehensive inventory of waste flows in Sweden. Several different methods have been used and combined: own questionnaire surveys, cooperation with the questionnaire surveys of sector organisations, waste factors, calculation models and expert assessments. An overall description of the scope and limitations of the inventory is given below. There is also a general overview of the methods applied, with reference to the appendices where more detailed information on the various surveys can be found.

[16] Manual for SMED's Quality System for waste reporting according to WStatR, 10 April 2006
[17] Swedish Environmental Protection Agency Quality Manual for reporting of waste statistics according to EU Regulation No 2150/2002

General information on the scope and limitations of the statistics

The statistics cover the generation of waste in all economic sectors and households. They cover waste activities of both small and large enterprises. In Sweden in 2006, there were more than 990 000 enterprises and about 917 000 local units, and more than 4.4 million households.

The statistics do not cover imports and exports of waste. However, imported waste quantities can be seen as a subset of the statistics when the waste is treated in Sweden. Similarly, waste can be generated in Sweden, which is seen in the statistics, but is treated abroad, which is not seen in Sweden's waste statistics.

Definitions and interpretations

Definitions and interpretations of waste treatment have a considerable impact on the end results. Appendix 1. Definitions and interpretations describes, discusses and justifies the interpretations we have made.

In the survey, we have applied a broad interpretation of the concept of waste. We have included several by-products in the concept of waste, e.g. sawdust, wood chips and off-cuts from sawmills, food waste from the food industry used as animal feed, etc. The European Commission published clarification of interpretations of the dividing-lines between waste and by-products in February 2007[18]. Our survey was already underway at this point in time, which meant that we could not follow the Interpretative Communication to the letter.

In connection with recovery, we have classified a waste as waste until it has become a new product or part of a new construction, etc.

Generated quantities of waste may have been counted twice in the event of a waste firstly being generated as one type of waste and during treatment becoming another. For example, when waste is sorted in different facilities, new waste is generated from the old waste. This may, for example, be mixed industrial waste or bulky waste from households which is sorted into different recoverable materials, combustible waste and landfill residue. The new fractions generated during sorting are classified as generated waste.

Recovery is, as stated above, when the waste has become a new product or part of a new construction, etc. We have not included recovery preparations, e.g. sorting, fragmentation, evaporation, de-watering, etc., in the recovery statistics. This interpretation ensures that recovery is not reported twice, since one particular waste flow is only reported once in the statistics on the recovery of waste.

In Accordance with the Waste Statistics Regulation, waste recycled internally (internal recycling is when the waste is material recycled in the same facility where it has been generated) is not reported, either as generated waste or as recovered waste, see Appendix 1 for further information.

Incineration of municipal waste and most industrial facilities are classified as R1, Use as fuel. These facilities have been primarily built to produce energy and not to dispose of waste.

[18] COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on the Interpretative Communication on waste and by-products Brussels, 21 Feb 2007. COM(2007)59 final

Waste from mining is included in the survey of the Mining and quarrying sector (NACE C). Some of the waste from mining is used in various ways to restore the mining pits (terracing, landscaping and such like). We have classified this as Land filling D1.

Key Aggregates and aggregation of sludge and dredging spoils

According to the waste statistics regulation, a number of summations and aggregations of types of wastes shall be calculated. In the Swedish statistics these have been done as follows:

- The key aggregates of generated waste (summations of "total hazardous waste", "total non-hazardous waste" and "total amount of waste"), are based on dry amounts for those types of waste given as both wet and dry amounts[19] and total quantities (which are wet amounts) for others.
- The tables with incineration and disposal of waste include the waste-type EWC-Stat 11, consisting of Normal sludges including dredging spoils (EWC-Stat 11.3) as a single item. Both wet amounts and dry substance amounts are given. The summations in these tables are based on the wet amount of the waste-type EWC-Stat 11, and the total amount (i.e. wet amount) of other waste-types. The waste-type 03.2 Industrial effluent sludges is aggregated with waste-types EWC-Stat 01, 02 and 03 as one item, and only the wet weight is counted.
- The recovery table shows EWC-Stat Normal sludges (incl. 11.3 Dredging spoils) aggregated with a number of other waste-types as one item. For EWC-Stat 11, only wet weight is counted in this item, and the total quantities of other waste-types (i.e. wet amount).

Overview of methods

We have used several methods to capture data and in almost all sectors, we have used several different methods. When selecting methods, our starting-point has been to prioritise good quality of statistics for flows of **hazardous** waste and **large** flows of waste that has been associated with environmental or resource problems.

We have mostly used local unit, facility, station or equivalent as survey objects. A local unit, facility, station or equivalent can have several different activities, one main activity and several secondary activities. We have in this event classified the entire local unit, facility, station or equivalent by its main activity. For example, coking plants can be found at steelworks. Independent coking plants should be classified as NACE 23 and steelworks as NACE 27. In our survey, coking plants at steelworks have been classified as belonging to NACE 27, and the waste generated there has been allocated to NACE 27.

[19] The following types of waste are given as both dry and wet weights:
03.2 Industrial effluent sludges (both hazardous and non-hazardous)
11 (excl. 11.3) Normal sludges
11.3 Dredging spoils

We have cooperated with several sector organisations that make their own compilations in order to reduce the burden on respondents. We have partly estimated small waste flows based on data from the previous reporting. This applies in particular to smaller local units or sub-sectors that generate less amounts of waste and do not do waste treatment.

The questionnaire surveys implemented have been voluntary for the respondents. The surveys have been carried out using paper questionnaires. Questionnaire surveys have been covered by statistical confidentiality[20]. As a result of this, partial results can be confidential if the data originate from only a few questionnaire responses or can, in some way, indirectly or directly, be attributed to a specific local unit, facility or enterprise.

In some sectors, the questionnaire surveys have been total, i.e. covering all local units/facilities/enterprises in the sector/sub-sector, while sample surveys have been used in other sectors. With the sample surveys, a division into different strata or sub-populations has been done first (by number of employees). A random sample of facilities who will receive the questionnaire was then taken from every stratum. When data are then compiled, a proportional extrapolation is carried out of the waste quantities received within each stratum, i.e. those responding within each stratum are considered representative of the stratum as a whole.

The inventory work has been divided into several sub-surveys. The division of sectors described in Annex I in the waste statistics regulation, i.e. the sectors for which generation of waste are to be reported, have been used as a basis for the division into sub-surveys. Every sub-survey has involved an inventory of both data on waste generated and data on the recovery and disposal of waste, including capacities in the sector or sub-sector. Tables I.1a-b provides an overview of the methodology used. Appendices 2 - 10 give a more detailed description for each sector, both in terms of waste generation in accordance with Annex 1 and recovery and disposal in accordance with Annex II in the Waste Statistics Regulation.

[20] The Secrecy Act (1980:100) and the Secrecy Ordinance (1980:657)

Table I.1.a. Overview of the methods used. Bold crosses refer to the main methods, which cover the largest and most important waste flows, smaller crosses refer to supplementary methods used to provide full coverage.

	NACE		Own questionnaire surveys	Questionnaire surveys from sector organisations	From WStatR2006	Environmental reports	Administrative data	Waste factors	Sector organisations	Other statistics	Other information
Waste generation in accordance with Annex I											
1	A	Agriculture, hunting and forestry						**X**	**X**		**X**
2	B	Fishing						**X**	**X**		**X**
3	C	Mining and quarrying			**x**	**X**					
4	DA	Manufacture of food products, beverages and tobacco	**X**		**x**						
5	DB + DC	Manufacture of textiles and textile products + manufacture of leather and leather products			**X**						
6	DD	Manufacture of wood and wood products	**X**	**X**	**x**			**X**			
7	DE	Manufacture of pulp, paper and paper products publishing and printing	**X**	**X**	**x**	**X**					
8	DF	Manufacture of coke, refined petroleum products and nuclear fuel			**x**	**X**					
9	DG + DH	Manufacture of chemicals, chemical products + manufacture of rubber and plastic products	**X**		**x**						
10	DI	Manufacture of other non-metallic mineral products	**X**		**x**						
11	DJ	Manufacture of basic metals and fabricated metal products	**X**	**X**	**x**						
12	DK + DL + DM	Manufacture of machinery and equipment n.e.c + manufacture of electrical and optical equipment + manufacture of transport equipment	**X**		**x**						
13	DN excl. 37	Manufacturing n.e.c			**x**						
14	E	Electricity, gas and water supply	**X**		**x**			**x**		**x**	**x**
15	F	Construction					**X**				**X**
16	G-Q excl. 90 and 51.57	Services				**X**	**X**	**X**	**X**		**X**
17	37	Recovery				**X**		**x**			**x**
18	51.57	Wholesale of waste and scrap				**X**		**X**			**x**
19	90	Sewage and refuse disposal, sanitation and similar activities	**X**		**x**	**X**			**x**	**x**	
20	-	Waste generated by households		**X**				**X**	**X**		**X**
Recovery and disposal in accordance with Annex II			**X**	**X**		**X**		**x**			
Number of treatment facilities and their capacities			**X**	**X**	**x**	**X**			**x**	**X**	**x**

Table I.1.b. Overview of methods used for inventory work

Item	NACE		Methods – data on generation of waste	Methods – data on recovery and disposal (including capacities)
1	A	Agriculture, hunting and forestry	Inventories of agriculture and forestry have been performed in separate sub-surveys and then added together. Agriculture: Waste factors for discarded equipment with sub-groups, discarded vehicles and tyres and for paper and household waste. Information from sector organisations for the majority of waste-types. Forestry: Waste factors for all waste-types apart from animal and vegetal wastes, where the data were gathered from a sector organisation.	No waste treatment is thought to occur in this sector, see Appendix 1.
2	B	Fishing	Waste factors from previous Nordic surveys, in some cases with minor adjustments. Detailed statistics on the physical and economic structure of the fishing fleet from the National Board of Fisheries. Official statistics on production and employment in aquaculture. Expert assessments / calculations of the quantity of discarded equipment and scrapped vessels.	No waste treatment is thought to occur in this sector, see Appendix 1.
3	C	Mining and quarrying	Information from environmental reports for the 18 largest mines and dressing plants. Data from 2004 have been reused for the rest of the sector.	Information from environmental reports for the 18 largest mines and dressing plants. Data from 2004 have been reused for the rest of the sector.
4	DA	Manufacture of food products, beverages and tobacco	Questionnaire survey - sample survey, only about generated food waste (EWC-Stat 09 and 09.11 respectively).2004 data have been reused for other waste-types and smaller industries.	Questionnaire survey - sample survey, only about treatment of food waste (EWC-Stat 09 and 09.11 respectively). 2004 data have been reused for own treatment of other waste-types.
5	DB + DC	Manufacture of textiles and textile products + manufacture of leather and leather products	No new survey, 2004 data have been reused.	No waste treatment has been identified in this sector in previous surveys.
6	DD	Manufacture of wood and wood products	Data on quantities of sawed quantities of wood from saws, NACE 20.1, was received from the Swedish Forest Industries Association. Using factors, these figures were converted to quantities of off-cuts/wood waste. 2004 data were reused for other waste-types in sub-sector NACE 20.1. Questionnaire survey - sample survey, for larger local units in other sectors NACE 20. Data from 2004 have been reused for the rest of the sector.	Recovery of wood waste for use in sawdust and wood fibre manufacturing and pellet production by special analysis. Use as fuel in NACE 20.1 from the Swedish Forest Industries Association. Questionnaire survey - sample survey, to larger local units in the rest of sector NACE 20. Data from 2004 have been reused for the rest of the sector.

Item	NACE		Methods – data on generation of waste	Methods – data on recovery and disposal (including capacities)
7	DE	Manufacture of pulp, paper and paper products; publishing and printing	Detailed data on the large pulp and paper mills were received from the Swedish Forest Industries Association. Questionnaire survey - sample survey, to larger local units in the rest of NACE 21. 2004 data were reused for the remaining local units in NACE 21 and for the whole of NACE 22.	Detailed data on the large pulp and paper mills was received from the Swedish Forest Industries Association. Questionnaire survey - sample survey, to larger local units in the rest of NACE 21. Recovery of waste paper in pulp and paper mills and wood chips from sawmills to pulp mills by special analysis.
8	DF	Manufacturing of coke, refined petroleum products and nuclear fuel	Data from environmental reports for 10 local units with major waste quantities. Data from 2004 have been reused for the rest of the sector.	Data from environmental reports for 10 local units with major waste quantities. Data from 2004 have been reused for the rest of the sector.
9	DG + DH	Manufacture of chemicals, chemical products + manufacture of rubber and plastic products	Questionnaire survey – sample survey for all NACE 24-25, excluding 24.5. Data from 2004 were reused for NACE 24.5 and small industry <10 employees.	Questionnaire survey – sample survey for all NACE 24-25, excluding 24.1. Data from 2004 were reused for NACE 24.1 and small industry <10 employees 2004. Recovery of scrap plastic and rubber waste in the sector by special analysis.
10	DI	Manufacture of other non-metallic mineral products	Questionnaire survey of 25 selected local units. The selection criteria were local units that had large quantities of waste in 2004 and/or own treatment activities, and large local units that did not respond to the survey in 2004. Data from 2004 have been reused for the rest of the sector.	Questionnaire survey of 25 selected local units. The selection criteria were local units that had large quantities of waste in 2004 and/or their own treatment activities, and large local units that did not respond to the survey in 2004. Recovery of glass wastes in the sector by special analysis.
11	DJ	Manufacture of basic metals and fabricated metal products	Data for large iron and steelworks were obtained from Jernkontoret.4 other large local units in NACE 27 from environmental reports. Questionnaire survey - sample survey to others in NACE 27 and all of NACE 28 with at least 20 employees. Data from 2004 were reused for small industry.	Data for large iron and steelworks were obtained from Jernkontoret (the Association of Swedish Steel Producers' Association). 4 other large local units in NACE 27 from environmental reports. Questionnaire survey - sample survey to others in NACE 27 and all of NACE 28 with at least 20 employees. Recovery of steel scrap in the sector by special analysis.
12	DK + DL + DM	Manufacture of machinery and equipment n.e.c + manufacture of electrical and optical equipment + manufacture of transport equipment	Questionnaire survey - sample survey to local units with at least 20 employees. Small industry according to the 2004 survey.	Questionnaire survey - sample survey to local units with at least 20 employees.
13	DN excl. 37	Manufacturing n.e.c	No new survey, 2004 data have been reused.	No waste treatment has been identified in this sector in previous surveys

Item	NACE		Methods – data on generation of waste	Methods – data on recovery and disposal (including capacities)
14	E	Electricity, gas and water supply	Incineration facilities: Questionnaire survey – total population survey of incineration facilities on waste generation from incineration and separated metal. Projection of 2004 data for other generation of waste. Analysis (telephone enquiries, calculations) from the electricity grid Projections: nuclear power plants, hydroelectric power stations, wind power stations Reuse of 2004 data: gas supply, water supply Waste factors for household waste and office paper waste	Incineration: Questionnaire survey – total population survey of waste incineration facilities. Incineration of tall pitch oil collected from the energy statistics Other treatment: Based on 2004 data Treatment capacities: Based on data on treated quantities
15	F	Construction	Expert panel - assessments	Expert panel - only recovery of excavated material (mineral waste) occurs in the construction sector,
16	G-Q excl. 90 and 51.57	Services: wholesale and retail trade; repair of motor vehicles, household and personal articles + hotels and restaurants + transport, storage and communication + financial mediation + real estate, rental and business activities + public service, defence and compulsory social insurance + education + health and social services; + other community, social and personal service activities + activities in households + extraterritorial organisations and bodies	Contact with sector organisations/industry representatives Kretsloppsregister (for transported hazardous waste) Waste factors for household waste, office paper and biological waste	Telephone and e-mail contact with enterprises/facilities/local units where waste treatment has been identified
17	37	Recovery	Waste data for the largest facilities have been compiled with the help of environmental reports from the largest facilities. Environmental report analysis and telephone and email contact with facilities/local units whose environmental reports have not provided sufficient information Data for smaller facilities have been extrapolated using factors extracted from the environmental report survey	No recovery or disposal in accordance with Annex II has been identified
18	51.57	Wholesale of waste and scrap	Waste factors for dismantling of cars. For others: data for the largest facilities have been compiled with the help of environmental reports from B facilities, coordinated NACE 37, and extrapolation of others using the waste factors from the environmental report survey	No recovery or disposal in accordance with Annex II has been identified

Item	NACE		Methods – data on generation of waste	Methods – data on recovery and disposal (including capacities)
19	90	Sewage and refuse disposal, sanitation and similar activities.	Sewage treatment: Use of sludge quantities from Sweden's reporting of sludge quantities in accordance with the Sludge Directive (86/278/EEC). Collection and treatment of waste: Questionnaire survey - total population survey of about 600 treatment facilities (other NACE-90 facilities are assumed to contribute minimal quantities of waste) Waste from sanitation activities: Use of data produced for reporting in accordance with WStatR 2006.	Questionnaire survey – total population survey to all waste treatment facilities
20	-	Waste from households	Data from Avfall Sverige (Swedish Waste Management) and other sector organisations and material recovery enterprises, industrial experts and authorities.	No waste treatment has been assumed to occur (home composting is considered equal to internal recycling).

As can be seen in the table, the inventory has been divided up into different sub-surveys as follows:

Analysis regarding Agriculture, hunting and forestry (NACE A) and Fishing (NACE B)

Generated waste in agriculture, hunting and forestry and in fishing was examined for the first time. A large proportion of the enterprises in the sectors included in NACE A and B have fewer than ten employees, and a questionnaire survey is therefore considered inappropriate as a data collection method. Waste factors, data from sector organisations and contacts with experts in each sector respectively have instead been used to estimate generated waste quantities. The waste factors have been obtained from studies previously performed by SMED, from international research studies and/or developed during the course of the project. No waste treatment is adjudged to occur in any of the sectors.

Survey regarding Mining and quarrying (NACE C) and Manufacturing (NACE D)

The Mining and quarrying and Manufacture sectors cover 11 different items in total in the reporting of waste generation in accordance with the Waste Statistics Regulation. Recovery and disposal occurs in many of these sectors/sub-sectors. In contrast to the previous 2004 surveys, when all sub-sectors were examined in a coordinated survey, several different methods depending on the sub-sector in question have been applied this time to produce waste data. In addition, those parts of the survey based on sample surveys have this time been performed using paper questionnaires. These have however been adapted to each sector as regards e.g. the waste-types pre-printed on the form. A total of 1 300 local units have been questioned, of which all had more than 100 employees. In addition to the various questionnaire surveys, a lot more data were also obtained this time from various sector organisations. Furthermore, the intention from the start was to partly obtain data for some sectors from environmental reports. Data from the 2004 survey were reused for some smaller sub-sectors and for small local units, not covered by the sample.

Survey regarding Electricity, gas and water supply (NACE E)

Both generation and recovery and disposal of waste have been examined for the Electricity, gas and water supply sector (NACE E).

All incineration of waste in this sector is classified as R1, Use as fuel. Most of the recovery in the sector is done at facilities that produce energy by combusting different types of waste fuel. Energy production from the combustion of all kinds of fuels also gives rise to a large part of the waste generated in the sector. A questionnaire survey (total population survey) has been performed for these enterprises in NACE 40. Use of tall pitch oil (EWC-Stat 3.1. Hazardous) has been obtained from the energy statistics. Furthermore, the generation of waste-types not requested in the questionnaire has been supplemented somewhat.

As regards electricity network enterprises, the quantity of generated waste has been examined via targeted questions to a small number of large and small enterprises, after which obtained data has been extrapolated based on cable length.

Data have been projected or reused from 2004 for other sub-sectors. These sectors are Nuclear power plants, Manufacture of gas, Hydroelectric power stations, Wind power stations and Water supply. Electricity trade enterprises only generate minimal quantities of waste.

Waste factors have been used for the sector as a whole as regards household waste and waste office paper.

Survey regarding Construction (NACE F)

A separate study based on expert assessments was carried out. Representatives from the waste industry, construction industry and public authorities as well as consultants and researchers have participated in the expert assessments. The survey has also been supplemented by the use of waste factors for household waste and waste office paper.

Survey regarding Services (NACE G-Q excl. 51.57 and 90)

In the Services reporting item, Wholesale of waste and scrap (NACE 51.57) and Sewage and refuse disposal, sanitation and similar activities (NACE 90) are excluded since these make up their own reporting items. The sector is large and heterogeneous. As a result, not all activities that give rise to waste could be covered, causing a certain amount of undercoverage. The survey has focused on surveying flows of hazardous waste as well as flows of waste that occurs in large quantities, or that is important to monitor with respect to Sweden's environmental quality objectives (e.g. food waste). The survey was performed by asking various industrial representatives and sector organisations about waste: county councils, the Swedish Maritime Administration (all ports), the Swedish Civil Aviation Authority (all airports), the Swedish Rescue Services Agency and the Armed Forces. Furthermore, the Kretsloppsregister[21] is used to cover the total amount of hazardous waste in the sector (excluding sub-sectors for which other sources have been used). Waste factors have been used for household waste, paper and office waste (counted as office paper) and animal and vegetal waste. Lead batteries and end-of-life vehicles have been calculated from other sources.

Treatment of waste only occurs to a limited extent and relates to the treatment of food waste, cremation of small animals and incineration of healthcare waste. This has been covered by telephone contact with the treatment enterprises.

[21] The Kretsloppsregister is a system managed by Sveriges Åkeriföretag (Swedish Road Hauliers' Association). The system is voluntary. The members of the Register send in electronically all their transport documents referring to completed transports of hazardous waste. The system is thought to cover about 50 - 60% of transports of conventional hazardous waste.

Survey regarding Recycling (NACE 37) and Wholesale of waste and scrap (NACE 51.57)

The Recycling sector (NACE 37) and the Wholesale of waste and scrap sector (NACE 51.57), excluding car dismantling, have been studied in a survey based on data collected from environmental reports covering the major players in both sectors.

The survey has covered the generation of waste. Treatment, which is to be reported in accordance with Annex II, does not occur in these sectors, only preparations for recovery and disposal occur in the form of waste sorting, fragmentation, etc.

Data on quantities of generated waste obtained from environmental reports from the major facilities have been used to calculate waste factors. Waste factors combined with the number of employees obtained from the Statistics Sweden Business Register have resulted in an estimation of the total quantities of generated waste in each sector.

Quantities of generated waste from car dismantling have been calculated using waste factors. The Swedish Car Recyclers Association (SBR) sends out an annual questionnaire on generated waste quantities and numbers of issued scrapping certificates to its members. Waste quantities per scrapping certificate are calculated from this. Data on the total number of scrapping certificates issued in Sweden are obtained from the Swedish National Road Administration. The dismantling of cars has been classified as a form of pre-treatment and is not included in the statistics on recovered and disposed waste.

Car dismantling facilities are classified as both NACE 37 and NACE 51.57 in the Business Register. Adhering strictly to the NACE classification, car dismantling should be allocated to NACE 51.57. In this year's survey, car dismantlers' waste has been allocated in full to NACE 51.57, whilst in the 2006 reporting (referring to waste in 2004), it was divided in accordance to how car dismantlers were actually classified in the Business Register.

Survey regarding Sewage and refuse disposal, sanitation and similar activities. (NACE 90)

The Sewage and refuse disposal, sanitation and similar activities sector (NACE 90) has been examined in three different studies using different approaches:

1) Collection and treatment of sewage: (NACE 90.01): For this sub-sector, only data on generated sludge have been produced. Types of waste not reported include screenings and such like, which are considered only to generate relatively small quantities. The data are estimates/expert assessments obtained from the international reporting done by Sweden in 2007 in accordance with the Sludge Directive (86/278/EEC) regarding 2004-2006. The reporting refers to just over 400 licensed facilities that perform "final treatment of sludge". This sludge originates to some extent also from smaller sewage facilities and private sewers. Data on sludge are entered as "Generated waste". Liquid, water-containing waste that is released into sewers has not been included as disposed waste.

2) Collection and treatment of other waste (NACE 90.02): A total population survey has been carried out of waste treatment facilities covering the generation of waste, the recovery and disposal of waste as well as treatment capacities. The survey method was a questionnaire survey with paper questionnaires as the measurement instrument. Nearly 600 waste treatment facilities have been approached.
3) Sanitation, remediation and similar activities (NACE 90.03): Use of data of waste generation produced for reporting in accordance with WStatR 2006 concerning 2004.

Survey regarding waste generated by households

The survey is based on data from Avfall Sverige (Swedish Waste Management) for "municipal" waste and from various material recovery enterprises for the wastes covered by producer responsibility. Regarding waste-types for which no statistics have been available, own analyses have been carried out with the help of data from sector organisations, industrial experts and authorities. For each waste stream, expert assessments have been made of how much of the waste has come from households and how much from businesses. No waste treatment is considered to have occurred (home composting is considered as equal to internal recycling).

Changes since the previous reference year

This is the second report in compliance with the European Waste Statistics Regulation. Several changes have been made to this reporting compared to the previous round as regards methodology and scope. The most important changes are:

1) This year, water-containing wastes have normally not been classified as waste when they have undergone a treatment process. One example is leachate water from landfill sites (classified as EWC-Stat 03.2) which is cleaned before being released into sewers or into recipient surface water. Other wastewater-related wastes have also been classified in this way. Last time, even the cleaned water was classified as waste.
2) In the last round of reporting, Sweden had been granted derogeration from reporting waste generation in sectors NACE A (Agriculture, hunting and forestry), NACE B (Fishing) and NACE G-Q (Services). These sectors have been included this time.
3) We have changed methodology in several sectors. In NACE 21 and NACE 27, we have this time used data from relevant sector organisations, whilst last time we performed an own questionnaire survey. In several cases, we have also used environmental reports instead of questionnaires.
4) All car dismantling facilities have been allocated to NACE 51.57. Last time we reported, these facilities were split between NACE 37 and 51.57 in accordance with their activity classification in the Business Register.
5) In this survey, we have tried to incorporate sorting facilities for waste in a better way, especially in NACE 90. As a result, the quantities of generated waste of various recycling materials (paper and carton waste, metallic wastes,

plastic waste, etc.) as well as combustible waste and landfill residue (both classified as EWC-Stat 10.2 and 10.3) in NACE 90 have increased considerably. Last time, we did not include specialist sorting facilities in the survey because we considered them as specialist pre-treatment facilities. The sorting facilities affect generated quantities of secondary waste in NACE 90 but are not included in the statistics on treated waste.

6) We have improved the questionnaires. This time, the forms are more sector-specific with more pre-printed examples of waste-types that occur in the sector. It has also been possible in several of the sub-surveys to answer using common waste codes. The questions on the treatment of waste have been clarified. This year's questionnaire responses should therefore contain fewer inaccuracies caused by respondents misunderstanding the questions.
7) Harvesting residue and other by-product fuel from forestry (EWC-Stat 09) are classified as waste in this year's survey. This was not the case last time since we had respite from reporting NACE A. The quantity of incinerated waste (incineration R1, use as fuel) has therefore increased. The same interpretation is used for generated waste from forestry.

Expected changes to the 2010 reporting referring to reference year 2008

Planning for 2010 reporting will start during 2008. The starting-point is to basically use the same methodology and have the same level of ambition as for the 2008 reporting. The following changes are currently being discussed:

1) Certain changes can be carried out to reduce the costs to society of the statistics production and to raise the level of ambition regarding statistical quality for some sectors/types of waste. This will be discussed in more detail when planning for the next survey begins.
2) We will examine changed interpretations of the distinctions between wastes and by-products, as a result of the Commission's Interpretative Communication on waste and by-products. A lot of off-cuts from sawmills, harvesting residue from forestry, metallic scrap from the metal industry, etc., will probably not be classified as waste.
3) In accordance with a decision by the Commission[22] a new NUTS classification applies from 2008, dividing Sweden into three NUTS 1 regions. Previously, the whole of Sweden was one NUTS 1 region. An amended NUTS classification affects the design of surveys on recovery and disposal of waste since recovery and disposal quantities should be reported on the NUTS 1 level. The classification on the NUTS level remains the same.
4) The classification of activities, popularly known as the industrial classification, has been revised. The Swedish Industrial Classification standard (SNI) is a statistical standard for the classification of production units (enterprises, lo-

[22] COMMISSION REGULATIONS (EC) No 105/2007 of 1 February 2007 amending the annexes to Regulation (EC) No 1059/2003 of the European Parliament and the Council on the establishment of a common classification of territorial units for statistics (NUTS)

cal units, etc.) into different activities/sectors. SNI uses the EU classification NACE (Nomenclature statistique des Activités économiques dans la Communauté Européenne) as a basis. A project to revise the current industrial classification standard, called NACE Rev 1.1 was completed in 2006 and a new version of NACE, NACE Rev. 2 has been established. The new Swedish standard, SNI 2007, was established by Statistics Sweden in May 2007 and is valid as from 1 January 2008. The new classification may lead to the waste statistics not being completely comparable with previous years.

Part II: Quality attributes

This report on quality attributes includes various different descriptions of the quality of the statistics. Important aspects of the description of quality are the relevance of the statistics, their accuracy and precision, accessibility and clarity, comparability, coherence and the burden on respondents.

The content of Part II describes the quality of the statistics primarily in relation to these aspects. The descriptions given are general. More detailed descriptions for each sub-survey are given in Appendices 2 – 10.

1 Relevance

Relevance (validity) refers in general to whether we measure what we intend to measure with the surveys performed. Relevance refers here to how the statistics are used on a national level and how complete the produced statistics are (using the requirements in the waste statistics regulation as a starting point).

Apart from our reporting obligation to the EU in accordance with the waste statistics regulation, statistics on waste generation and recovery and disposal of waste are needed in Sweden for the follow-up and development of environmental policies and action plans.

Environmental work is governed by 16 environmental quality objectives[23] that need to be achieved in order to solve the major environmental problems within one generation. Waste flows and waste management have an impact on developments within the objectives: A good built environment, Reduced climate impact and A non-toxic environment. A national waste plan has been drawn up[24] to help achieve these objectives, in which the different objectives and instruments available within the field of waste are put into context. The impact of the measures that have been taken has been analysed and the areas which need to be prioritised in the work in the field of waste over the coming years have been highlighted in waste plans. The national environmental objectives are currently being reviewed, however, and several of the intermediate targets relating to waste management will be amended. Waste statistics are needed in order to be able to follow up these environmental objectives.

The existing waste statistics are considered to be useful for both the follow-up and the development of action plans in this field, even if follow-up indicators and other uses based on the new statistics need to be developed.

There are many different users of waste statistics - citizens, politicians, municipal, regional and national authorities, central government offices, industry, researchers, etc. This is because development towards good environmental quality is seen as everyone’s responsibility. Authorities competent for the follow-up and analysis of measures regarding the waste-related aspects of the environmental quality objectives, such as the National Board of Housing, Building and Planning, the

[23] www.miljomal.nu
[24] Strategy for sustainable waste management. Sweden's waste plan. Swedish Environmental Protection Agency

Swedish Environmental Protection Agency, the Swedish Chemicals Agency and county administrative boards and municipalities are considered to be more dependent on the statistics.

The datasets in the reporting are complete. The value zero (0) has been reported in some cases, based on expert assessments that the quantity of waste of a certain category is practically zero. The European Commission's regulation on reporting formats[25] states that member states may write "L" (logically impossible) instead of 0 for some waste types to indicate that a certain type of waste can absolutely not occur within a certain sector. Sweden has not classified data as "L" in this reporting as we considered it difficult to truly identify when a type of waste is "logically impossible".

2 Accuracy

Table II.1 presents the key aggregates reported.

Table II.1. Key aggregates for generated and treated waste in 2006.

Country: Sweden **Reference year: 2006**		**Total hazardous waste (key aggregates),** ***1000 tonnes***	**Total non-hazardous waste (key aggregates)** ***1000 tonnes***	**Coefficient of variation hazardous waste** ***%***	**Coefficient of variation non-hazardous waste** ***%***
Generation of waste					
1	**Households**	489.073	3851.596	7	8
2	**Enterprises**	2164.270	108939.050	10	2
Recovery and disposal of waste					
1	**Incineration with energy recovery R1**	208.781	18587.709	16	3
2	**Incineration as a means of disposal D10**	103.477	1.210	1	5
3	**Recovery R2-R11**	338.837	26059.194	11	12
4	**Landfilling D1, D3, D4, D5, D12. Land treatment and release to water D2, D6, D7**	378.028	66491.038	3	1

Inventories of some types of waste (mostly sludge and dredging spoils) have been performed using both dry and wet quantities, whilst other types are just total quantities (which are the same as wet quantities). How wet weights and dry weights are dealt with in various summations is described on page 13 of the previous report.

Appendix 12 shows how uncertainty estimates for these key aggregates have been done. Uncertainties have been produced for all surveys, and we have made an

[25] COMMISSION REGULATION (EC) No 782/2005 of 24 May 2005 setting out the format for the transmission of results on waste statistics

assessment of the certainty of the figure for each piece of data. The variation coefficients in the table above do not just include statistically estimated uncertainties caused by sampling and non-response in the questionnaire surveys. Uncertainties for other types of surveys and systematic errors have also been estimated and taken into account in the variation coefficients.

In order to understand the key aggregates in the table, the following information should be noted:

1) The largest items of generated waste (wet weight) are
   - mineral waste from mining (62 million tonnes)
   - off-cuts from sawmills (18 million tonnes)
   - leachate from landfill sites. (3.8 million tonnes)
   - sludge from the production of drinking water (1 million tonnes)
   - excavated material from construction activities (7 million tonnes)

   These five waste-types are together responsible for about 74% of the total wet amount of waste generated.
2) The definition of wood off-cuts as waste or by-product can be discussed. Here we have classified all off-cuts from sawmills and other wood product industries as waste. Several things point to off-cuts being classifiable as by-product in accordance with the Commission's Interpretative Communication on waste and by-products[26]. A classification of off-cuts from sawmills and harvesting residue from forestry as by-product instead of waste reduces the quantity of generated non-hazardous waste by 20 000 ktonnes. The quantity of waste recovered as R1 "Main use as fuel or other methods of generating energy" decreases by about 7 300 ktonnes and the quantity recovered (R2-R11) by 8 900 ktonnes.
3) Households produce a relatively large quantity of hazardous waste. About 62% of this quantity is made up of end-of-life vehicles and more than 26% of waste from electric and electronic equipment (WEEE).
4) The quantity of incinerated waste includes use of wood waste (classified as EWC-Stat 07.5) and harvesting residue (classified as EWC-Stat 09) in heating plants, and incineration of bark and wood waste in the paper and pulp industry, see also Point 2 above.
5) The quantity of landfilled waste is large because the depositing of mining waste is included. 62 million tonnes, corresponding to 94% of reported landfilled waste, is landfilled waste within the sector Mining and quarrying (NACE C), which is in turn completely dominated by mining.
6. The reported quantity of recovered and disposed waste is less than the reported quantity of waste generated. This could be for several reasons:
   - Uncertainty in the estimations.
   - Generated waste includes double reporting of the same material stream which can change classification during the waste management process. For example, a type of waste can occur within the mining and manufacturing industries (NACE C and NACE D) and then further

26 COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on the Interpretative Communication on waste and by-products Brussels, 21 Feb 2007. COM(2007)59 final

processed in NACE 37, NACE 51.57 or NACE 90, giving rise to secondary waste, which is also counted as generated waste. The secondary waste is treated by recovery or disposal. Pre-treatment in NACE 37, NACE 51.57 and NACE 90 is not included as waste treatment but can give rise to the generation of secondary waste.

- The reporting of recovery and disposal of waste only covers facilities which require a permit or registration according to Articles 9, 10 or 11 in Directive 75/442/EEC. In practice, not all recycling comes under this rule:
  - Secondary raw materials are classified as waste according to the Mayer Parry judgment from the European Court of Justice (C 444/00) but, before this ruling, were often considered as a commodity instead of a waste. We have mainly examined recovery in the manufacturing industry through contacts with material recycling enterprises (for producer responsibility material) and sector organisations (for other material). It is often difficult in questionnaire surveys to capture this recovery since the companies don't consider it as waste or recovery material. This means that there may be an undercoverage of recovery.
  - Mineral wastes, certain combustion wastes, treated contaminated soil, etc are widely used as construction materials in construction works. Much of this usage is difficult to survey.
  - Use of sludge from sewage treatment in agriculture has not been reported as a treatment method, nor when sludge has been used in construction work and the like. Production of compost and biofertiliser (anaerobic digestion residue) from the anaerobic digestion of waste is included as recovery, as is the case when sludge is mixed with other material to produce soil.
  - Return of biofuel ash to the forest has not been included.
  - Uncontaminated dredging spoils dumped in water in conjunction with dredging operations is not included either.
- Certain other types of waste treatment have not been captured in the surveys either. For example, we have identified the following cases where the inventories are not complete:
  - Liquid water-containing waste that is released into sewers has not been included as disposed waste. It has been reported as generated, but at the sewage treatment plant it goes through biological treatments (D8) and physic-chemical treatments (D9) that are not supposed to be reported in accordance with the waste statistics regulation.
  - Dismantling of cars has not been included as a treatment method. We have classified dismantling of cars as pre-treatment. This means that end-of-life vehicles are counted as waste twice: first, they are generated as hazardous waste mostly in the household sector. Then, they reach a car dismantler (NACE 51.57) who removes reusable components and hazardous products. This generates non-hazardous

end-of-life vehicles as waste. Hazardous components (oils, anti-freeze, etc.) are also generated as waste.

The accuracy of the data on the generation of waste and recovery and disposal of waste is described in detail in Appendices 2 - 10 for the different sectors. The text is structured on the basis of the headings dictated by Eurostat. This has occasionally led to difficulties as the headings are adapted for simple questionnaire surveys and are difficult to apply when several survey methods have been used, especially if different methods have been used for different sub-sectors within a sector. All the relevant information has however been included.

2.1 Sampling errors

Sampling errors occur when only a selection of the local units/facilities/enterprises that are included in the group in question is surveyed. The error is due to the degree of variation in the data and can be controlled by choosing the right sample design.

Different sampling methods have been used in some sectors within NACE D (Manufacturing). Sampling errors occur primarily when extrapolations are carried out of inhomogeneous groups. If the sample group is small, it is easy for extreme values from one responding local unit to result in a considerable adjustment error. This is reflected at the same time in the coefficients of variation. Sampling errors for generated and treated waste and treatment capacity are described in Appendix 4 for the sectors examined using sample surveys within NACE D.

2.2 Non-sampling errors

2.2.1 COVERAGE ERRORS

2.2.1.1 Coverage errors regarding the population

Coverage errors regarding the population occur when the survey method results in waste:

- quantities from some local units/facilities included in the target group being missed in the survey, known as “undercoverage”.
- the same local unit or facility is included in several sub-surveys, known as “overcoverage”.

Coverage errors lead to waste quantities either being missed or counted twice.

Coverage errors are described in more detail in Appendices 2 - 10 for generated waste, the recovery and disposal of waste and the capacities for recovery and disposal for each sub-survey.

Different frames have been used in different surveys, i.e.:

- NACE C and NACE D are based on local units in the Statistics Sweden Business Register.
- NACE E (sub-sector Energy production from combustion) is based on the register of energy enterprises used for the official energy statistics.

- NACE 90 (sector NACE 90.02 Collection and treatment of other waste) is based on the emissions database (EMIR) from the county administrative boards and the Swedish Environmental Protection Agency, which covers facilities with permits for environmentally harmful operations according to the Environmental Code. Facilities with permits for the treatment of waste were selected from this database.
- NACE 37 and 51.57 are based on a combination of EMIR and the Business Register.

Within many sub-sectors, supplementary sources, such as sector organisations or environmental reports, have also been used.

The use of different frames can, in theory, have resulted in both overcoverage (an object being counted twice in several surveys) and undercoverage (an object being missed by several frames) in several sectors. The different surveys have been checked against each other with the aim of detecting any objects that have appeared in several of the frames. Any cases identified where data have appeared twice have been corrected. We therefore assume that no data have been counted twice.

None of the questionnaire surveys cover the entire reporting sector in question. The questionnaire surveys are instead designed to capture data on the most important waste flows in the sector and then supplementary work has been done to achieve 100% coverage. An example of such supplementary work is as follows:

- Results from WStatR 2006 have been used within NACE D for enterprises with less than 10 employees (20 employees in certain sectors) which were not included in the frame. A supplementary study within NACE D has been performed to capture recovery operations defined by the Mayer Parry judgment, i.e. recovery of paper, plastic, rubber, wood and metal in the manufacturing industry
- Within NACE D, some sub-sectors with small quantities of waste have been excluded from the questionnaire survey. Waste quantities from the previous survey for 2004 have been reused for these.
- Within the Manufacturing industry (NACE D, i.e. NACE 15-36), data for certain sub-sectors have been either partly or entirely gathered from other sources instead of from questionnaire surveys. This applies e.g. to data on large pulp and paper mills from the Swedish Forest Industries Association and data on large iron and steelworks from Jernkontoret. Environmental reports have been used for large mines and dressing plants and for petrol refineries.

- Within NACE E, separate studies have been performed or data projected or reused for the most significant operations that have not been covered by the questionnaire survey.
- Within the Sewage and refuse disposal, sanitation and similar activities sector (NACE 90), data from a study performed for reporting in accordance with WStatR 2006 for NACE 90.03 (Sanitation) were used. Further, data from international reporting in accordance with the Sludge Directive have been used for NACE 90.01 Collection and treatment of sewage.

2.2.1.2 Coverage errors regarding waste quantities

The survey has been designed to cover all operations and all households in principle.

We have interpreted the definition of waste rather broadly. Some difficulties affecting data collection have been due to the fact that respondents have in practice not fully applied the official definition. This concerns for example:

a. By-products. The boundary between a by-product and waste is sometimes hard to define. The Commission's Interpretative Communication on waste and by-products specifies some criteria for when a residue product need not be classified as waste, see discussion in Appendix 1. Definitions and interpretations. We have not followed the Interpretative Communication in the survey since the survey had already been planned and started when the communication was published. For example, the following "by-products" (occurring in large quantities) have been classified as waste:

- Off-cuts from sawmills. This is used as a raw material in the pulp industry and for manufacturing pellets. Alternatively, it is used as fuel in e.g. the energy sector.
- Felling residue etc. from forestry. This is sold as fuel to the energy sector.
- Metallic wastes (scrap) from the metal industry. This is sold to the scrap industry (normally in NACE 37 or 51.57) which then sells it on to metalworks (NACE 27).
- Excavated material. The majority of excavated material dug-up during construction or foundation projects is reused in other construction projects.

Data on these wastes are associated with uncertainties since many respondents do not consider this material as waste. We have estimated these waste quantities using an extrapolation process, see Appendix 4 (for wood and metallic wastes) and Appendix 6 (excavated material). "Used fuel" instead of "incinerated fuel" is requested in the questionnaire survey for the energy sector. This should give good coverage for "by-product fuel" as well.

b. Liquid water-containing waste that is released into sewers. In practice, some liquid waste that is released into sewers the respondents consider it to be waste water rather than waste, and there is a risk of respondents not in-

cluding it in a questionnaire response. When it is a question of treated waste water, we have declassified this as non-waste since it has been treated (generated sludge and the like is counted as waste, however).

2.2.1.3 Coverage of recovery and disposal

We have applied the following interpretations and limitations regarding recovery and disposal:

1. Incineration: recovery operation

The incineration of waste in Sweden is, in general, classified as a recovery operation: R1 Use as fuel. Waste incineration facilities are integrated in the district heating system and, to a certain extent, also in electricity production systems. Facilities are designed to produce district heating and electricity. In most cases, the facilities are also run by private or municipal energy companies and not by waste management companies. This applies also to facilities that incinerate household and similar wastes. In Sweden, these constitute base production units in the district heating network to which they provide heating.

Off-cuts and waste from the wood products industry (NACE 20) is a significant energy source of district heating production in Sweden. Off-cuts and waste from the wood products industry (NACE DD) and the pulp and paper industry (NACE DE) are also used for the production of energy for industrial use (i.e. steam and electricity). We have, as mentioned above, interpreted off-cuts as waste and classified them as Wood waste (EWC-Stat 07.5). Waste from the forest (e.g. harvesting residue) and any park and garden waste consisting of wood is also a significant source of fuel for energy production, e.g. for district heating production. This "wood fuel" is classified as Animal and vegetal waste (EWC-Stat 09). Use of off-cuts and other wood fuel for energy production is waste incineration (classified as R1). This has the consequence that Sweden reports a relatively large quantity of these two waste types for incineration, as well as a very high total incineration capacity.

2. Incineration: disposal operation

One large-scale facility in NACE 90 that incinerates hazardous waste has been classified as D10 Incineration on land. Even if this facility produces electricity and district heating, we have assumed that it was designed and is operated primarily with a view to disposing of waste and, only in second place, for producing energy (with the interpretation of R1 given in the new proposal for a framework directive, the facility will likely be classified in the future as R1 Use as fuel).

3. Recovery

When classifying recovery and when waste ceases to be waste, we have followed the Mayer Parry judgment (European Court of Justice judgment C-444/00). This has meant that

- Material recycling occurs mainly in the manufacturing industry (NACE D). In the recovered waste statistics, we have only included

"final" recovery when the waste becomes a new product in connection with a manufacturing process. For material recycling in NACE D (15-36), we have mostly collected data from sector organisations and material recycling enterprises. In addition, there may be facilities that use secondary raw materials as raw materials and that don't consider this as a waste.

- A waste ceases to be waste only when it has become a new product in a manufacturing process or until it is part of a construction. For waste treatment facilities within NACE 90 and industrial landfill sites within NACE C and D, the use of by-products for covering waste landfills and/or as construction material has been classified as recovery, because the waste in these cases replaces other material. There may be some undercoverage for this form of recovery. Large quantities of ash, slag and some inert waste are used as material in construction works, replacing another virgin material. We cover use as final coverage for landfill sites quite well, but recovery on various building sites, roadworks and the like has been difficult to survey.
- Anaerobic digestion and composting, occurring primarily within NACE 90 and to a limited extent in NACE D, has been classified as recovery. All licensed composting and anaerobic digestion facilities are included in the survey.
- Different operations occur in several sectors (sorting, grinding, other processing) and these can lead to recovery, but we have classified these are pre-treatment, which is not covered by the reporting.

4. Landfilling

All licensed waste facilities with landfills are included in the survey. Landfilling also covers intermediate storage for more than one year. Waste from mining is covered in the survey on NACE C. Most of the waste from mining is used in various ways to restore the mining pits (terracing, landscaping and such like). We have classified this as landfilling D1, apart from in one case where, in our opinion, the waste really does replace another material.

5. Other disposal

Other disposal mostly refers to Release to water (D6 and D7) and Land treatment (D2). Treated water, e.g. leachate from landfill sites or some industrial water-containing emissions have not been considered as waste in this year's survey.

2.2.1.4 Household waste

Household and similar wastes (i.e. EWC-Stat code 10.1) can arise within all activities. Household waste is included as a surveyed waste type in several of the questionnaire surveys, e.g. within NACE D and NACE 90. Prior to commencing data collection, an analysis was performed of how household waste from sectors examined in the questionnaire survey was reported in the last reporting round. The results showed that the average for about 1 000 local units that reported household

waste was around 100 kg per employee[27]. This figure has then been used in the sectors where we have not obtained any data from questionnaire surveys.

In practice, sorted household waste (from business) can also have been classified as mixed and undifferentiated materials. Many enterprises usually have a sorted fraction for combustible waste. Household waste from business operations can often be put into a waste fraction called "combustible waste". In these cases we have reported the entire quantity as mixed and undifferentiated materials (EWC-Stat 10.2).

In the sub-project covering waste generated by households (see Appendix 10), it has been estimated how much of the household waste originates from business operations and how much from households. The result showed that nearly 2.7 million tonnes of household and similar waste (i.e. EWC-Stat 10.1) were generated, about 85% of which was generated in households.

2.2.1.5 Problems encountered by respondents when filling in data. Definitions, questionnaire design, etc.

In the questionnaire surveys in NACE D, we have had sector-specific questionnaires with the waste types in EWC-Stat occurring in the sector pre-printed on them. Examples of what is included in each waste type have also been given. Furthermore, there has been space to add waste types that respondents have not been able to classify in EWC-Stat. Usually, the common waste code has then been specified. In some cases no waste code has been specified, just a name for the waste. We have then classified these ourselves into common waste codes or EWC-Stat based on the description.

A possible error can be the respondent classifying wastes incorrectly in EWC-Stat. We have had a conversion key that has been available on the Statistics Sweden website (the link was given on the questionnaire), but respondents may themselves have tried to classify the waste into EWC-Stat categories based on the name rather than on the conversion key.

Common problems we have encountered when collecting data in the questionnaire surveys within NACE D include the following:

1) Coding of certain hazardous waste has been unclear and confused, e.g. the difference between Spent solvents (EWC-Stat 01.1), Chemical preparation wastes (02) and Chemical deposits and residues (03.1).
2) Waste containing oil can be classified under different codes according to EWC-Stat. There is for example oil-containing waste within: 01.3. Used oils, 03.1 Chemical deposits and residues, 03.2 Industrial effluent sludges and 08 Discarded equipment.
3) There has often been confusion between the EWC-Stat codes Household and similar waste (10.1) and Mixed and undifferentiated materials (10.2). The confusion of 10.1 and 10.2 occurs mostly in operations that generate waste.

[27] ARAP - Study of the use of waste factors. Study performed by SMED at the behest of the Swedish Environmental Protection Agency. 15 January 2007

4) The different types of sludges can also sometimes be difficult to define. Industrial effluent sludges (03.2) can have been coded as Common sludges (11) or vice versa. There are several types of sludge occurring in industry which the respondents can have classified as Industrial effluent sludges (03.2) whilst they should have classified them as Common sludges (11). By using sector-specific questionnaires with clarifying examples, we have tried to make definition as easy as possible for the respondents. Similarly, when reviewing the questionnaires, we have made an assessment for each local unit as to whether 03.2 or 11 is the appropriate classification.
5) Several respondents have specified that they have generated Hazardous metallic wastes (06). The majority of these have actually produced other types of waste, such as non-hazardous metallic wastes (06) or hazardous chemical preparation wastes (02), such as metal packaging contaminated by oil or paint.

There has also been confusion between 10.2 (Mixed and undifferentiated materials) and 10.3 (Sorting residues) at treatment facilities that sort waste, e.g. in NACE 90.

Self-defined, sector-specific and pre-printed waste types were used for the questionnaire surveys in NACE E and NACE 90. The reason for this was that experience from the previous study showed that respondents found it difficult to understand the EWC-Stat codes and definitions used. This time, names of types of fuel and wastes were used with which respondents were already familiar. The waste types comprise aggregations of waste types in the waste list that are suitable for the sector. These aggregations are performed so that the waste type can be attributed unequivocally to a specific EWC-Stat code. It was also possible for respondents to state their own waste types.

Other problems with how respondents interpreted the questionnaires include:

1) There was uncertainty as to whether ash generated from non-waste fuel should be included on the NACE E questionnaire. This was clarified in the reminder. The respondent was contacted in cases where we suspected ash to be missing.
2) Despite using sector-specific concepts, it seems some respondents in NACE E were unclear about what was meant by the concept of "waste fuel". This is particularly true in the case of wood fuel. The respondent was contacted in suspect cases.
3) Every questionnaire in NACE E was to refer to all the enterprise's facilities for energy production from incineration. In some cases, the questionnaire responses have only covered some of the facilities. The respondent was contacted in suspect cases.
4) Many waste facilities in NACE 90 that have sorting facilities also have a recycling centre where households can take bulky waste (e.g. sorted into combustible waste, landfill residue, sortable), electrical waste, garden waste, wood waste, etc. Only the waste generated during sorting, i.e. wastes that changed waste code during sorting, is to be classified as gener-

ated in NACE 90. Many facilities have specified all outgoing fractions regardless of whether they have been sorted or left at the recycling centre.

5) It was in general difficult to obtain data on waste generated in connection with sorting in NACE 90. The questionnaire requested both input waste (for sorting) and waste from sorting (outgoing sorted waste), but there were still major shortcomings in the quality of response.

2.2.2 MEASUREMENT ERRORS

Measurement errors can occur when incorrect data are received from respondents and are not corrected during reviewing. Furthermore, estimated values have been permitted in the surveys. This can affect the precision of the quantities given.

Quantities have been requested in tonnes in the questionnaires. It is relatively common for the respondents to have submitted data in another quantity unit. If a different quantity unit (kg or 1000 tonnes) has been reported, we have simply recalculated it to tonnes. Conversion factors have been used if other units have been reported. Conversion factors have been obtained from data from respondents and other experts, including Swedish Waste Management (Avfall Sverige), Statistics Sweden energy statistics, the Swedish Forest Industries Association (Skogsindustrierna), etc. Some of the conversion factors are not particularly controversial, such as tonne per m3 of oil or tonne per m3 of sludge, while problems have occurred when the waste has been mixed, for example, or when we do not know whether the waste has been compressed or not. The same conversion factors have been used in all sub-surveys for similar wastes.

The questionnaires were designed based on our experience from previous data collections. We designed sector-specific questionnaires with pre-printed waste types and examples from each sector in order to reduce the risk of response error. All questionnaires and covering letters were also tested by the Statistics Sweden measurement technology lab. All questionnaires and covering letters have been approved by the Board of Swedish Industry and Commerce for Better Regulation (NNR) and the Swedish Association of Local Authorities and Regions (SALAR) in a consultation process.

In cases where material recycling is carried out at the facility where the waste was generated, neither the generation nor the recycling of these quantities should be reported. This has led to great problems for respondents and those checking, with the result that undetected errors can have occurred.

Another important source of error can be mistakes in the responses we have received. Incorrect responses can be due to carelessness or misunderstanding of the respondents. When checking the questionnaires, we have carried out a rationality test: is the type of waste reasonable for the sector, is the magnitude reasonable, is there some other type of waste not given that should arise in the sector, etc. In several cases, we have detected relatively large errors in the submitted responses. There can however still be incorrect responses that we have not detected. It is hard to quantify these errors as we have made a lot of effort to eliminate them.

2.2.3 PROCESSING ERRORS

Processing errors occur when the raw data are processed in various ways during the data production. The following processing errors can occur:

1) Checking errors. In questionnaire surveys, all the submitted questionnaires are checked and corrected. When larger possible errors have been detected in the questionnaires, contact has been made with the respondent. Lesser errors have been corrected and some imputations (of household waste, for example) have been carried out when data were missing. A processing error can occur when the person checking the questionnaire misunderstands the responses and makes an incorrect amendment. Checking errors can result in incorrectly coded waste or an incorrect quantity for a specific type of waste.
2) Input errors. The questionnaires are checked in paper format and are then input into a database manually. When inputting, the "right figure" can be input in the "wrong place", or a mistake can be made with the input (e.g. one digit too few or too many). Input errors can also occur when the results from other survey methods are entered and when data is entered into Excel tables in the database.
3) Adjustment errors. A significant processing error can occur when carrying out extrapolation, in particular with questionnaire surveys. Extrapolation is carried out principally for the adjustment of inhomogeneous groups. If the sample group is small, it is easy for extreme values from one responding local unit to result in a considerable adjustment error. This is reflected at the same time in the coefficients of variation. Appendix 4 describes the sampling errors for the sectors concerned.

We have attempted to avoid the above-mentioned processing errors by regularly checking the results. The project group has checked the results several times (individual types of waste in every reporting sector or sub-survey) in order to identify extraordinary values. Industry experts, both within SMED and within the Swedish Environmental Protection Agency, have also carried out review, assessing the rationality of the produced data.

2.2.4 NON-RESPONSE ERROR

Non-response adjustments are normally carried out in questionnaire surveys. This applies for both generated waste and recovered and disposed waste. Non-response adjustments are different in the different sectors, depending on whether the non-response can be assumed to be representative of the whole population. Non-response errors for waste generation and recovery and disposal of waste and for treatment capacities are described for each of the surveyed sectors in detail in the appendices.

3 Timeliness

A general time schedule for the reporting according to the EU waste statistics regulation is shown in Table II.3.1.

Table II.3.1. Time schedule for reporting waste statistics

Activity	Start	Completed
Planning, preparations and supplementary method developments	1 July 2006	28 February 2007
Data collection and processing	1 March 2007	15 February 2008
Compilation of statistics	15 January 2008	1 March 2008
Compilation of checking documentation	1 December 2007	1 March 2008
Drafting of Quality Report	1 December 2007	1 March 2008
Final checking of statistics and documentation	1 March 2008	17 March 2008
Follow-up of statistical production, report	18 March 2008	1 May 2008
National independent controls and approval for reporting	18 March 2008	30 June 2008
Drafting of national statistical report	15 February 2008	30 August 2008
Supplementary work, follow-up, archiving	18 March 2008	30 September 2008
Delivery of statistics and quality report to Eurostat		30 June 2008
National publication of statistical report		30 September 2008

4 Accessibility and clarity

Statistics on waste generation and recovery and disposal of waste of waste are planned to be published on the website of the Swedish Environmental Protection Agency[28] at the end of June 2008, when reporting to Eurostat is complete. The current quality report will also be published at the same time. It is planned that a statistical report will also be published in September 2008, in which the numerical material will be presented and discussed. The design of the Internet reporting and statistical report is to be developed during spring/summer 2008.

The intention is for this quality report to be a resource for more advanced statistical users in order to increase clarity regarding methods and checking procedures, for example. With the aim of increasing the clarity for other users of statistics, a brief analysis and comments are planned to be published together with the statistics in a statistical report and Internet publication.

The statistics are collected confidentially, according to the Official Statistics Act and the Secrecy Act. In order to reduce the amount of confidential data in the final statistical tables, respondents have been asked on the questionnaires whether they are willing to relinquish their right to confidentiality. The disclosure control

[28] www.naturvardsverket.se

has shown that not all the results can be published, such as certain types of waste for certain sectors, because in several cases, the waste quantities or treatment within one particular company can be identified from the results. Such results cannot be published according to the confidentiality regulations.

5 Comparability

5.1 Comparability with other member states and between sectors

The regulatory framework and guidelines from Eurostat have been followed as far as possible. All surveys have been carried out to achieve 100% coverage of waste quantities. This should guarantee that the statistics are comparable with corresponding statistics from other member states. However, the following areas should be highlighted as somewhat problematic concerning comparability:

- Different frames have been used for different sectors (see section 2.2.1 and appendices for the different sub-surveys):
- The concept household waste contains, apart from waste generated by households, both in practice and legally, similar waste from shops, offices and other operations. The majority of waste flows, such as bag and dustbin waste, packaging waste, electronic scrap, etc. contain both waste generated by households and waste from different operations. For every waste flow included in household waste (according to EWC-Stat), an assessment has been made by industry experts of how much originates from households and how much from other operations. See Appendix 10.
- The distinctions between waste and by-products have had a considerable effect on the statistics and hence on comparability with other countries. We have used a broad interpretation of the concept of waste (see Appendix 1).
- We have mostly used establishment, facility, station or equivalent as survey objects. A local unit, facility, station or equivalent can have several different activities, one main activity and several secondary activities. We have in this case classified the entire local unit, facility, station or equivalent by its main activity. For example, coking plants can be found at steelworks. Independent coking plants should be classified as NACE 23 and steelworks as NACE 27. In our survey, coking plants at steelworks have been classified as belonging to NACE 27, and the waste generated there has been allocated to NACE 27.

Resources and efforts have consciously been evenly distributed to ensure that, as far as possible, the same care has been taken with all the sub-surveys. Some industries have, for natural reasons, been harder to survey than others, resulting in some differences in the precision of the final results.

For details of the level of coverage for individual industries, see Chapter 2 in the relevant appendix.

5.2 Regional comparability of waste treatment

VALIDATION OF DATA REGARDING TREATMENT OF WASTE

Data on waste treatment facilities have as far as possible been checked against other administrative data (e.g. EMIR which is a register of facilities with permits for environmentally hazardous activities according to the Environmental Code. Compiled results have also been checked for quality by independent experts.

STATISTICAL UNITS

The objects have been different in different sub-surveys. Those used include local unit, facility, enterprise and sector. See also the earlier section on Comparability and Appendices 2 – 10.

MOBILE WASTE TREATMENT

For the generation of waste and the recovery and disposal of waste, mobile equipment has been reported where it has been used. Capacity data have, however, been reported in the home town. We have only found very few mobile operations in the survey, so the location of the facility is not considered to have any determining significance on the total reported quantities of waste or treatment capacities.

5.3 Comparability over time

The current survey is basically comparable to the survey carried out prior to the previous reporting. Some changes have been made in scope, interpretations and methodology that affect the results.

Results from the next survey (which will be reported in 2010 and refers to generation of waste and waste treatment during 2008) will be able to be compared with this year's survey. Changes in the interpretation of the definitions of waste and the concept of recovery (which have been discussed within the EU's thematic strategy on the prevention and recycling of waste, and also brought up in the Commission's proposal for a new framework directive) can mean that this year's results will not be comparable with the next survey.

The results so far have shown that there are relatively large uncertainties associated with the results produced. This means that even if the results are comparable, it can be difficult to interpret the differences. The differences can, in some cases, reflect statistical uncertainties and, in other cases, be due to actual changes.

6 Coherence

The Swedish official statistics on generated and treated waste quantities are planned to be based on the same statistical information (same surveys, scope and limitations of statistics) as the statistics that are to be reported to Eurostat.

7 Burden on respondents

As mentioned previously, several different parties have been involved in producing the statistics. This has resulted in costs in terms of time and/or money for respondents, the Swedish authorities and Eurostat. The total costs for the work carried out in Sweden are estimated to be around SEK 20.5 million or EUR 2.3 million. Table II.7.1 shows the costs for the various parties involved.

Table II.7.1. Total costs 2006-2008 for reporting according to the waste statistics regulation 2008 (WStatR 2008).

	Hours	SEK	EUR
Total costs to society		20 530 000	2 281 000
Costs to Swedish government		19 158 000	2 129 000
Of which work to contractors	-	13 218 000	1 469 000
Of which work carried out at the Swedish Environmental Protection Agency	8 500	5 940 000	660 000
Other costs to society in Sweden	1 900	1 372 000	152 000
Of which efforts by respondents with questionnaires	1 300	986 000	110 000
Of which other efforts by respondents	500	386 000	43 000

Time spent by respondents on responding to the questionnaires is estimated at an average of between 45 minutes and 1 hour per completed questionnaire depending on how extensive it is. Around 1 600 completed questionnaires then give a burden of 1 300 hours for submitted questionnaires.

The workload for Swedish Environmental Protection Agency and other work efforts by respondents have been estimated using expert assessments.

Assignments to the contractor: Costs refer to assignments during the period 2006-2008.

We have used the currency exchange rate of 9 SEK/EUR. Furthermore, a charge of 700 SEK (ca. EUR 80) per hour has been assumed for the work carried out by respondents and the Swedish Environmental Protection Agency.

Definitions, units and abbreviations

MR	**Environmental reports (Miljörapporter)**
Accessibility and clarity	A *quality attribute* used to describe the quality of the statistics produced. Accessibility and clarity refer to how the results are published in the country, various planned improvements and how confidentiality issues are managed.
Accuracy	A *quality attribute* used to describe the quality of the statistics produced. When describing accuracy, descriptions are included of sampling procedures, coverage errors, measurement errors, processing errors, non-response errors, model assumption errors, etc.
Avfall Sverige (Swedish Waste Management)	Sector organisation for waste management and recovery (previously RVF) See www.avfallsverige.se
Burden on respondents	A *quality attribute* used to describe the work done by respondents to help produce the statistics.
Coherence	A *quality attribute* used to describe the quality of the statistics produced. Coherence refers to how statistics can be used in a Swedish context.
Comparability	A *quality attribute* used to describe the quality of the statistics produced. A description of comparability consists primarily of how the produced statistics can be compared with other statistics.
D-code	Code for *disposal* operations as outlined in Annex IIA in Directive 75/442/EEC or in Annex 5 of the Swedish Waste Ordinance 2001:1063. See also *Disposal.*
Disclosure control	A disclosure control is carried out for a produced dataset to analyse whether it is possible from the dataset to directly or indirectly disclose the situation for an individual enterprise. If it is possible from the results to identify the information on an individual enterprise or facility, the data in question must be made confidential.
Disposal (of waste)	*Waste treatment* which includes the processes given in the list of disposal operations in Annex IIA in Directive 75/442/EEC or in Annex 5 of the Swedish Waste Ordinance 2001:1063
EMIR	Register and emissions database of facilities with a permit for environmentally harmful operations according to the Environmental Code.
Eurostat	The authority within the EU responsible for EU's waste statistics. Data are delivered to Eurostat according to the waste statistics regulation.
EWC-Stat	A specific waste classification used when reporting according to the EU's waste statistics regulation. EWC-Stat consists of 48 types of waste that are primarily materials-based. EWC-Stat is based on combinations of different types of waste from the usual list of waste (Annex 2 of the Swedish Waste Ordinance 2001:1063)
FDB	Statistics Sweden's Business Register
Generation of waste	Waste produced
IVL	Swedish Environmental Research Institute, see further under *SMED*
Kretsloppsregister (Eco-cycle Register)	The Kretsloppsregister is a system administered by the Swedish Hauliers' Association. The system is voluntary. The members of the Kretsloppsregister send in electronically all their transport documents referring to completed transports of hazardous waste. The system is thought to cover about 50 - 60% of transports of conventional hazardous waste.
List of wastes	In Annex 2 of the Waste Ordinance (2001:1063), there is a list of different types of waste. This is usually used to classify different wastes in various circumstances. This list has previously been called EWC (European Waste Catalogue)

LoW	*List of wastes* The same as the list of wastes in Annex 2 of the Swedish Waste Ordinance 2001:1063 and the European Commission's decision 2000/532/EC
NACE	NACE stands for the "Nomenclature Générale des Activités Economiques dans les Communautés Européennes" and is a classification of activities used within the EU, which corresponds to the Swedish SNI classification (SNI stands for Svensk Näringslivsindelning). The version of NACE referred to in the waste statistics regulation is NACE Rev 1. The most recent version of the SNI is SNI 2002.
Quality attributes	According to a European Commission regulation (No 1445/2005), a quality report for the reporting according to the waste statistics regulation should contain a description of the quality of the produced statistics. According to the regulation, there are seven different quality attributes to be described: *Relevance, Accuracy, Timeliness, Accessibility and clarity, Comparability, Coherence and Burden on respondents* (see these definitions)
R-code	Code for *recovery* operations in Annex IIB in Directive 75/442/EEC or in Annex 4 of the Swedish Waste Ordinance 2001:1063. See also *Recovery*
Recovery (of waste)	Waste treatment covering the processes given as recovery processes in Annex IIB in Directive 75/442/EEC or in Annex 4 of the Swedish Waste Ordinance 2001:1063
Relevance	A *quality attribute* used to describe the quality of the statistics produced. Relevance relates to a description of how the statistics are used on a national level and the completeness of the data produced.
Sample survey	Statistical method based on studying a selection of the different subsets instead of the entire population. In a sample survey, the population (in this case, an entire sector) is first divided up into different sub-populations (strata). We have divided up into sub-populations based on number of employees at each local unit. Within every stratum, a random sample of local units is then selected. When compiling the results, a proportional extrapolation is then carried out within each stratum.
SBR	Swedish Car Recyclers Association
SCB	Statistics Sweden, see further under SMED
SMED	Swedish Methodology for Environmental Data (Svenska Miljöemissionsdata), a consortium consisting of IVL Swedish Environmental Research Institute, Statistics Sweden, the Swedish University of Agricultural Sciences (SLU) and the Swedish Meteorological and Hydrological Institute (SMHI).
Stratum	A sub-population when using sample surveys (plural strata). See further under *Sample survey*
Timeliness	A *quality attribute* used to describe the quality of the statistics produced. Timeliness comprises primarily of a description of the important moments for data production and reporting.
Treatment (of waste)	*Recovery* and *disposal* (see these definitions)
Waste treatment	*Recovery* and *disposal* (see these definitions)
WStatR	EU Waste Statistics Regulation (2150/2002)

Appendix 1

Definitions and interpretations

1 The definition of waste

Waste is, according to Sweden's national encyclopaedia, all remains that are considered to lack any utility value. However, that which is considered waste differs among the different sectors of society. In EU legislation, waste is any item that the owner of the item wishes to get rid of, regardless of its value. The EU's waste definition[29] is repeated in the Swedish Environmental Code[30] and reads:

> Waste shall mean any substance or object included in one of the waste categories and which the holder discards or intends to or is required to discard[31].

The EU's definition of waste has also been judged in several cases in the European Court of Justice (ECJ). On the basis of these judgements, the following conclusions can be drawn:

- A material can be waste even if it has an economic value[32].
- By-products are, in many cases, waste. Only when a by-product is produced deliberately rather than unintentionally can it be declassified[33]. The European Commission published an Interpretative Communication on waste and by-products (COM(2007)59 final) on 21 February 2007 that tries to clarify the difference between waste and by-product. The Commission's interpretation is based on a number of ECJ cases.
- In conjunction with recycling, waste ceases to be waste first when it has become a new product in the process[34]. This definition is under discussion as part of the work on a new framework directive.

These points are developed below.

Within the EU, a list of waste has also been compiled[35]. This list is also found as Annex 2 in the Swedish Waste Ordinance[36]. The list contains close to 900 different types of waste and also indicates the various types of waste that should be classified as hazardous. The list of waste also specifies a number of criteria for assessing whether waste should be classified as hazardous.

[29] Council Directive 15 July 1975 on waste (75/442/EEC)
[30] Environmental Code 1998:808, Chapter 15, §1
[31] Annex 1 in the Swedish Waste Ordinance (2001:1063) lists 16 different waste categories, Q1 to Q16.
[32] The ECJ's ruling in the combined cases C-206/88 and C-207/88, Vessoso and Zanetti (REG 1990, p. I-1461), point 9
[33] ECJ ruling C-457/02 (Niselli); ECJ ruling C-235/02 (Saetti & Frediani)
[34] ECJ judgment C- 444/00 (Mayer Parry)
[35] COMMISSION DECISION of 3 May 2000 (2000/532/EEC)
[36] Waste Ordinance 2001:1063

2 Waste and by-products

The European Commission published an Interpretative Communication on waste and by-products (COM(2007)59 final) on 21 February 2007. This communication can be seen as a step in the drafting of a new framework directive and as a result of the discussions in the thematic strategy on increased prevention and recovery of waste. The following definitions are used in the communication:

- Product: all material that is deliberately created in a production process. In many cases, it is possible to identify one (or more) "primary" products, which is the principal material produced.
- Production residue: a material that is not deliberately produced in a production process but may or may not be a waste.
- By-product: a production residue that is not a waste.

In the communication, the Commission presents three criteria (all of which must be fulfilled) for when a production residue is a by-product and not waste:

1. Is the further use of the material a certainty not a mere possibility?
2. Can the material be reused without further processing?
3. Is it part of a continuing process of production?

At the same time, criteria are listed for when a production residue is a waste (only one criterion needs to be fulfilled for it to be classified as waste):

1. No use other than disposal can be envisaged, or the use has a high environmental impact or requires special protection measures
2. The treatment method for the material in question is a standard waste treatment method.
3. The undertaking perceives the material as waste
4. The undertaking seeks to limit the quantity of material produced

The Commission also gives a number of examples of production residues that can be classified as by-products (it should be noted that it is not the material itself that makes the classification but the entire decision tree):

- Blast furnace slag returned to the production process without further processing
- Production residues from the food industry that can be used as animal feed without further processing.
- Off-cuts from the wood product industry used as raw material for the production of wood-based panels such as particle boards or in paper production.

The Commission also states in more general terms that excess material from a primary production process, or material that is deficient only in a cosmetic way but that is materially similar to the primary product, such as rubber compound and vulcanisation mix, cork shavings and pieces, plastic scrap and similar material may be seen as by-products. For this to be the case, they must be able to be reused directly either back in the primary production process or in other integrated production where reuse is also certain. The Commission also states that when material of

this kind demands a full recycling or recovery operation, or contains contaminants that need to be removed before it can be further reused or processed, this would indicate that the material is a waste until the recycling or recovery operation is completed.

3 Application of the waste definition in this survey

3.1 APPLICATION OF THE WASTE DEFINITION

In this survey, we have applied the definition of waste broadly. The survey was already planned when the Commission published its Interpretative Communication and we have not taken this into account in our work.

In the survey, we have noticed that respondents (those generating and treating waste) do not, in practice, interpret the definition in the same way as the authorities, especially not when it comes to the distinction between waste and by-product. Drawing a line between a by-product and waste is difficult, particularly when the waste/by-product is recycled or sold. The statistics therefore cover many waste types/by-products from industrial processes which are not understood as waste in the daily industrial operations, or in general. One example of this is sawdust and other off-cuts from sawmills, and also metal scrap.

In this survey, we have often interpreted these borderline cases as waste. A different interpretation of the concept of waste in these cases would give a significantly different result in the waste statistics. For example, the following "by-products" (that occur in large quantities) have been classified as waste:

- Off-cuts from sawmills. This is sold to heating plants or the pulp industry.
- Harvesting residue etc. from forestry. This is sold as fuel to the energy sector.
- Metallic wastes (scrap) from the metal industry. This is sold to the scrap industry (normally in NACE 37 or 51.57), who then sell it on to metal works (NACE 28).
- Excavated material. The majority of excavated material dug-up during construction or foundation projects is reused in other construction projects.
- Tall pitch oil, made from production residues in the pulp and paper industry and used as fuel in the energy sector.

3.2 WASTE THAT IS COUNTED TWICE

Generated quantities of waste are counted twice when a waste firstly occurs as a type of waste and after some treatment becomes another. One example of this is end-of-use vehicles (hazardous waste), which when dismantled generate end-of-use vehicles (non-hazardous waste). Even when waste is sorted in different facilities, new waste is generated from the old waste. This may, for example, be mixed industrial waste or bulky waste from households which is sorted into different recoverable materials, combustible waste and landfill residue. The new fractions generated during sorting are classified as generated waste.

The generated quantities of waste in these statistics are hence not a measure of primary generated waste in society as a result of consumption and production, but more a gross amount of both primary waste and secondary generated waste, where the latter is a result of waste treatment.

3.3 THE DEFINITION OF WASTE IN THE NEW FRAMEWORK DIRECTIVE

Within the EU, a new framework directive on waste is currently being drafted. The existing waste definition will not be changed. The distinction between waste and by-products is discussed in the Commission's Interpretative Communication on waste and by-products (COM(2007)59) and the same interpretation is likely to remain. In the new directive, changes will furthermore be made to when some types of waste cease to be waste in conjunction with recycling/recovery. This can be material such as clean plastic waste, scrap, wastepaper and the like that constitute orthodox raw materials in production processes and for which a market exists.

4 Interpretation of recycling and recovery

The ECJ case Mayer Parry (C-444/00) states that waste ceases to be waste first when it becomes a new product. We have interpreted this so that recycling and recovery is the process where waste becomes a new product. Previously the general interpretation has been that waste ceases to be waste when it can be used as a raw material in a manufacturing process. When looking at recyclable paper, for example, waste paper can be considered waste until it has become new pulp or new paper at a pulp/paper factory. This means that pre-treatments, sorting, etc. do not constitute recycling. Sorting and such like occurs within NACE 37 Recycling, but one consequence of the Mayer-Parry case is that recycling no longer occurs in practice within NACE 37 but most commonly within the manufacturing industry (NACE D).

The concepts of recycling and recovery also include the production of soil improvement fertilisers from composting or anaerobic digestion. Even the use of ash, slag and mineral waste as construction material for example in roads has been counted as recycling. This is also the case when various by-products are used as material for the coverage and packing of landfill sites. In all these cases, the waste is considered to replace another material.

When reporting recovery, we have included only the "final" recovery or "final" recycling when the waste becomes a new product, not pre-treatment and sorting. This interpretation ensures that recovery is not reported twice, as one particular waste flow is only reported once in the statistics on the recovery of waste.

5 Interpretation of landfilling

Waste from mining is included in the survey of the Mining and quarrying sector (NACE C). Some of the waste from mining is used in various ways to restore the mining pits (terracing, landscaping and such like). We have classified this as Landfilling D1.

6 Interpretation of internal recycling

In accordance with the Waste Statistics Regulation, internal recycling has not been included in the statistics. Internal recycling means that the waste is returned to the same or similar process and in the same facility where it occurred. Some examples of internal recycling include:

- Solvent waste that is processed and used again in the chemical or pharmaceutical industry.
- Plastic waste from packaging manufacture where the plastic is returned by mixing it with regular plastic raw material.
- Metallic wastes collected in a steelworks or foundry and can then be remelted.

7 Changed interpretation in this survey

We have changed some interpretations in this survey compared to the last one and these affect the statistics and how they are in turn interpreted:

1) This year, water-containing waste has normally not been classified as waste if it has undergone a treatment process. One example is leachate from landfill sites (classified as EWC-Stat 03.2) which is treated before being released into sewers or into recipient surface water. Other sewage-related waste has also been classified in this way. Last time, even the treated water was classified as waste.
2) In this year's survey, we have tried to include waste sorting facilities in a better way. As a result, the quantities of generated waste of various recycling materials (paper and carton waste, metallic wastes, plastic waste, etc.) as well as combustible waste and landfill residue (both classified as EWC-Stat 10.2 and 10.3) in NACE 90 have increased considerably. Last time, we did not include specialist sorting facilities in the survey because we considered them as specialist pre-treatment facilities. The sorting facilities affect generated quantities of secondary waste in NACE 90 but are not included in the statistics on treated waste.

8 Capacities for waste treatment

In first hand, capacities for recovery and disposal means licensed capacity for waste treatment. When the licenses capacity is not applicable, the "technical capacity" for treatment facilities should be identified and used for reporting.

Capacities for waste treatment are often difficult to specify in practice. Licensed capacity in tonnes per time unit are only specified in permits for some types of treatment, such as waste incineration, which is covered by the EU directive on waste incineration. Entirely different measures to describe the size of a facility are used for many types of treatment. For energy facilities, for example, maximum quantity of supplied fuel in MW is used, which is not relevant to describe the likely annual incineration of waste at the facility.

For landfills, the area within which landfilling may be performed and to what maximum height are often specified in permits. In practice, the landfill is often gradually extended or expanded as the need increases within the framework of the

permit. This doesn't provide an unequivocal definition of the remaining landfill capacity either.

For many treatment facilities, the permitted capacity may also cover several different treatments, for example that the facility is licensed to receive 100 000 tonnes/year for landfilling, composting, anaerobic digestion and sorting.

Respondents have often found it difficult to specify capacities in these units and in the way requested. When relevant capacity data have been missing and have not been retrievable from environmental reports or by contacting respondents, we have employed the following principles to calculate the capacity:

- For landfilling, we have assumed that "the average landfill" will remain operational for five years. Often, but not always, the permit is granted for 10 years, after which time a new assessment is required. We have then calculated the capacity as the volume of five annual quantities of landfilled waste.
- For other treatment methods, we have assumed that the permitted capacity is approximately the same as the treated quantity, i.e. that the facilities receive the maximum quantity of waste allowed.

Appendix 2

Agriculture, hunting and forestry (NACE A)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

Data on waste quantities have been compiled by contacting the following organisations:

- Avfall Sverige (Swedish Waste Management) quantity of animal manure sent for anaerobic digestion
- Keep Sweden Tidy: collected quantity of farming scrap
- JTI - Swedish Institute of Agricultural and Environmental Engineering: Background data for waste factors for vehicle-related waste including tyres, batteries, etc.
- Konvex AB: animal waste
- The Lantmännen group, section for plant protection, feed and machines: several types of waste
- Svensk Ensilageplast Retur AB (SvepRetur) and YARA: plastic waste
- Svenska Skogsplantor and SCA Packaging: paper and cardboard wastes
- Swedish Wood-fuel Association: vegetal waste from forestry

In addition, official statistics from Statistics Sweden, Swedish Board of Agriculture, Swedish Institute for Transport and Communications Analysis (SIKA), National Board of Forestry and SMP (Swedish Machinery Testing Institute) have been used as background data in combination with data from above-mentioned organisations and/or waste factors developed by SMED or gathered from international research studies. Examples of background data used include sector-disaggregated statistics on registered and deregistered vehicles, employment statistics and statistics on pesticide use.

2 Accuracy

The largest general source of uncertainty seems to be that the coverage rate for data from sector organisations is often unknown. As regards individual types of waste, the greatest uncertainty is probably for all vehicle-related types of waste, where estimations are based on relatively uncertain assumptions about, for example, the weight and useful life of vehicles, tyre/battery change frequency, etc.

2.1 SAMPLING ERRORS

Not applicable for this sector.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

Since data is collected from different sources for different types of waste, the coverage rate also varies between the waste categories. For certain specific types of waste, e.g. contaminated pesticide packaging, it has been totally impossible to compile data.

2.2.1.1 Coverage errors regarding the population

Since most farming and to a certain extent small-scale forestry is done directly adjacent to the household, it is in some cases difficult to determine which sector the waste should be attributed to. This can apply to e.g. batteries and discarded equipment. Another case is animal waste, where the estimation is based on the quantity of carcass collected by Konvex. The vast majority of carcasses from farming activities, as well as e.g. riding horses and larger animals from zoos, are included. A certain amount of overcoverage can be suspected here.

2.2.1.2 Coverage errors regarding waste quantities

Several types of waste, e.g. solvent waste, were assessed in an earlier method study performed by SMED[37] occurs in "small or no quantities". This type of waste has therefore not been surveyed, causing slight undercoverage. The method study provides good support, however, for the assumption that these quantities are negligible in relation to the total amount of waste in the sector.

Data from sector organisations does not provide 100% coverage in most cases. Within certain waste categories, there are only data on certain specific types of waste. This applies to e.g. chemical preparation wastes (EWC-Stat-code 02), where the estimate quantity only covers pesticide residues and aerosols for forestry machine use, non-hazardous metallic wastes (06), where only "farming scrap" and frequent spare parts for forestry machines are includes, and hazardous discarded equipment (08.Hazardous) that only covers discarded oil filters collected from farms and the equivalent from forest machines. In several cases the quantity data refers to the waste collected in 2006, which does not necessarily mean the waste was generated in that year. This can lead to undercoverage for certain years, when no waste is collected, and overcoverage for other years, when a campaign may lead to scrap and other waste that has been lying about on farms for years is then registered as collected.

In the end-of-life vehicle category (08.1), only registered tractors, trucks and forest machines are covered. The abovementioned types of undercoverage are not included in the specified estimated uncertainties. The size of the error is unknown

[37] SMED 2007 (Rasmusson & Sundqvist): Methodology development for the Agriculture, forestry and fishing sector

and varies between the various types of waste. Our ambition has however been to cover the most important types of waste within each category.

The reported quantity of 09 Animal and vegetal waste is made up entirely of harvesting residue from forestry and is further used a fuel in mainly district heating plants. If this was instead classified as by-product instead of waste, the entire quantity (3 000 000 tonnes) will disappear from the statistics. According to industrial representatives, only material for which one gets paid is removed from the forest, otherwise it is left there.

2.2.2 Measurement errors

Not applicable for this sector.

2.2.3 Processing errors

Not applicable for this sector.

2.2.4 Non-response errors

Not applicable for this sector.

2.2.5 Model assumption errors

The waste factors for office paper and household waste are deemed to be of good quality. The same applies to the waste factors for waste from forest machine use. Other vehicle-related waste factors are however based to a large degree on assumptions. Since tractor tyres are not included in the tyre recycling system and their size and replacement frequency varies considerably, the uncertainty for rubber waste is substantial. Even the uncertainty in the assumed quantity of end-of-life vehicles from forestry is considerable. Based on the data available, however, we have tried to only include quantities that are generated as production residues in other primary forest harvesting activities.

2.2.6 Other errors affecting accuracy

One source of error for which it is difficult to estimate the significance is the quality of the data. Because the collection of several types of waste, including farming scrap and pesticide residues, is done in the form of campaigns conducted at irregular intervals, the collected quantities do not necessarily reflect the waste that has actually been generated during the reference year. This may apply for example to farming scrap that is often left lying around farms for several years. The estimated quantities therefore become strongly dependent on the collection frequency and the year in which a certain type of waste is collected.

In certain cases, there is uncertainty as to which waste category certain quantity data should be attributed. For example, we have chosen to count the entire quantity of “farming scrap” as non-hazardous metallic wastes, but some of this waste could well be considered discarded equipment or mixed and undifferentiated material, or even end-of-life vehicles instead.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

Waste treatment is deemed not to occur in the sector and regional comparability is therefore not applicable. We have therefore not included agriculture's use of sludge, sludge residue, etc. as waste treatment, nor forestry's use of biofuel ash for vitalisation fertilisation.

Appendix 3

Fishing (NACE B)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

Generated quantities of waste in NACE B have been calculated based on waste factors and structural data from the National Board of Fisheries section for socio-economics. Data from the National Board of Fisheries include number of vessels, days at sea and on-board crew within different vessel segments. The waste factors have mostly been obtained from the Nordic Council of Ministers publication TemaNord 2006:502. Handling waste onboard fishing boats and smaller vessels and have been adjusted with regard to the size of Swedish fishing vessels. Factors for end-of-life fishing equipment have been compiled in consultation with a sales company. The quantity of end-of-life vehicles in terms of scrapper fishing vessels has been calculated by consultants (Börjessons Marin AB).

2 Accuracy

The accuracy of the structural data on different vessel segments, based on National Board of Fisheries annual surveys, is deemed to be good. The waste factors are associated with very large uncertainty, however. The reason for this is that they were originally developed through interviews with crew members on a small number of Faroese vessels at the beginning of the 1990s. Some of these factors were revised on the basis of research studies about 10 years later, but there is little background data and they are not entirely relevant to the Swedish fishing fleet. Our assessment is, however, that the factors are sufficiently good to give an idea of the size of generated waste quantities. The waste item “scrapped fishing vessels” is calculated exactly for each boat, which provides very high accuracy for this particular type of waste. Furthermore, the calculations are so detailed that they can form the basis for the development of a relevant waste factor for this waste item in future surveys.

2.1 SAMPLING ERRORS

Not applicable for this sector.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

Different forms of coverage error occur depending on limitations in the statistical data and partially incomplete waste factors.

2.2.1.1 Coverage errors regarding the population

Waste generated on Swedish-registered licensed fishing vessels is included in the reported waste quantities for NACE B. In other words, waste from Swedish fishing vessels that may have been taken ashore abroad is included, but not waste that has been deposited in Swedish harbours by foreign fishing vessels. Furthermore, fishing in internal waters (inland fisheries) is not included since vessels don't need to be licensed for it. Waste quantities from inland fisheries can almost certainly be expected to be negligible in relation to sea-fishing waste, bearing in mind the fact that the inland fisheries catch has been about 1 500 tonnes compared to over 250 000 tonnes per year for sea fisheries. This coverage error is therefore deemed to have little or no significance with regard to the large degree of uncertainty in the waste factors.

2.2.1.2 Coverage errors regarding waste quantities

The waste factors employed mainly cover different types of oil waste, sewage sludge, as well as household waste and similar waste. When developing factors for waste from end-of-life fishing equipment (wire, nets, etc.), the factual basis has been partly inadequate, which can lead to undercoverage of the "discarded equipment" (EWCStat 08) and Mixed and undifferentiated material (10.2) waste-types. Within NACE B, only oil-contaminated fractions (water, sludge and permanently oleaginous waste) is covered in the category "chemical deposits and residues (03.1 hazardous waste). Glass, paper and plastic waste (07.1, 07.2 and 07.4) only include sorted fractions from household waste. Even for this type of coverage error, their contribution to the overall uncertainty in the data is small compared to the uncertainty in the waste factors.

2.2.2 Measurement errors

Not applicable for this sector.

2.2.3 Processing errors

Not applicable for this sector.

2.2.4 Non-response errors

Not applicable for this sector.

2.2.5 Model assumption errors

Household waste and accompanying sorted fractions, sewage sludge and different types of oil waste have been estimated with the help of waste factors. These factors

have considerable intrinsic uncertainty which affects the accuracy of most of the waste-types. Uncertainty in the waste factors is deemed to be easily the largest source of error in the survey.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

Waste treatment is not applicable to the sector.

Appendix 4

Mining and quarrying (NACE C) and Manufacturing (NACE D)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

The survey on waste in the sectors Mining and quarrying (NACE C) and Manufacturing (NACE D) covers 11 different reporting items on the generation of waste according to the waste statistics regulation, see the table below:

Table B4.1. Reporting items in NACE C and D

Reporting item no	NACE code		Name
3	C	10 – 14	Mining and quarrying
4	DA	15 – 16	Manufacture of food products, beverages and tobacco
5	DB+DC	17 – 19	Manufacture of textiles and textile products + Manufacture of leather and leather products
6	DD	20	Manufacture of wood and wood products
7	DE	21 – 22	Manufacture of pulp, paper and paper products; publishing and printing
8	DF	23	Manufacture of coke, refined petroleum products and nuclear fuel
9	DG + DH	24 – 25	Manufacture of chemicals, chemical products + Manufacture of rubber and plastic products
10	DI	26	Manufacture of other non-metallic mineral products
11	DJ	27 – 28	Manufacture of basic metals and fabricated metal products
12	DK+DL+DM	29 – 35	Manufacture of machinery and equipment n e c + Manufacture of electrical and optical equipment + Manufacture of transport equipment
13	DN excl. 37	36	Manufacturing n.e.c.

The survey also covered the recovery and disposal of waste within these sectors.

Several different data sources have been used in this year's survey of NACE C + D. Stratified sample surveys with paper questionnaires have been the basis of the majority of the sectors in NACE C + D. Waste data from sector organisations for larger local units have been used for some sectors and environmental reports have been used for a few others. Some sectors with small quantities of waste have not been surveyed at all this time. Data from the 2004 survey have been reused instead.

A new aspect of this year's questionnaire surveys is that they have been adapted to each sector. There have been seven different variations of the questionnaire. From the previous survey, we saw which types of waste had been generated from the various industries. This information has now been used and the various questionnaires have had the types of waste that are typical for the different industries preprinted on them. It has also been possible to specify any other types of waste on the form. Another measure taken to simplify the procedure for respondents was to exclude a special table requesting information on any treatment they carried out themselves with quantity data on different types of waste broken down into different treatment methods. This table was excluded for all the industries surveyed apart from NACE 26. The table has been replaced with a question on the first page of the questionnaire asking whether respondents have treated waste themselves during the year or not. We have then contacted those who answered yes to this question and asked a series of complementary questions about the type of treatment employed and the quantities of the different waste-types treated. The reason for this simplification was that so few local units in the majority of industries, according to early surveys, had treated waste themselves. It therefore felt unnecessary to make the questionnaire more difficult for most respondents by including an unnecessary table. In the previous survey, we received numerous incorrectly filled-in waste treatment tables as well as unnecessary calls from respondents who had questions about the table.

A summary of the different methods for the various sectors in NACE C+D can be found in Table 1.1 in the chapter entitled General description of the methods used in Part 1.

A common feature of all sub-surveys performed using questionnaires is that responding to them has been voluntary. The frame consists of Statistics Sweden's Business Register and the object is local unit primarily coded under NACE 10-36.

Different models have been employed to extrapolate total quantities of waste both for sampling and non-response. For waste quantities from the smallest local units that were not included in the survey population, data from the 2004 survey were reused.

The most important source for compensating for missing data in the questionnaire surveys has been environmental reports, which some local units sent in instead of or in addition to filling in the form. In other cases, data from previous surveys have been used if possible.

In order to be able to report more complete statistics, contacts have been made with several sector organisations. The aim is to obtain data on how much secondary raw materials of different important materials are used in connection with the production of new products, i.e. when waste has ceased to be waste and has instead been converted into a new product.

2 Accuracy

The source of error affecting the results to the greatest extent can probably be linked to non-response and sampling. Many large important local units have not submitted data despite being repeatedly reminded. Sample surveys can give a skewed sample, with too great adjustments of extreme values.

2.1 SAMPLING ERRORS

The population of all 11 sectors consists of nearly 60 000 local units. The frame for the sub-sectors surveyed using questionnaires is made up of all local units mostly with more than 10 or 20 employees within the various sub-sectors in the industry and consists of 4 700 local units in total. A stratified sample of a total of 1 300 local units was drawn from this frame in February 2007. The sample can randomly give non-representative local units with extreme values which when extrapolating can produce incorrect results on a total level.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

To compile data adapted to the waste statistics ordinance, different methods have this time been used for different sectors in NACE C+D, as described above. Regardless of whether the method was questionnaire surveys or data from environmental reports or sector organisations, the remaining data, mostly from small, unsurveyed local units, has been reused from the 2004 survey. How the data were compiled for 2004 is described in the quality report for that year[38].

The questionnaire surveys have not been adapted in accordance with the interpretation of the definition of waste and the concept of recycling in the Mayer-Perry case (ECJ judgment C-444/00), i.e. that a waste does not cease to be waste until it is part of a new product. To meet these requirements, we would need to ask for data in the questionnaire on the quantity of secondary raw materials used by the local unit for the production of goods of different materials. Our experience from earlier surveys shows that the manufacturing facilities do not consider themselves to be recycling or recovering waste when they use secondary raw materials. It would therefore almost certainly have been confusing and problematic for many of the respondents that the local unit should be counted as a recycling facility in the reporting. In order to collect data on recycling, we have instead chosen to make contact with a number of sector organisations to obtain data on how much secondary raw materials have been used for production of goods of different materials, i.e. to obtain data on the recovery of various materials in different manufacturing industries. The materials for which we received recycling data in this way were waste paper, wood shavings and chippings, recyclable glass, scrap steel and scrap plastic. These often very high values can contain considerable errors, when the

[38] Quality Report for statistics on generation and recovery and disposal of waste in Sweden 2004 according to EU Regulation on Waste Statistics 2150/2002. Swedish Environmental Protection Agency. Report 55594. June 2006.

sector organisation in question has only reported data from its members and some "recyclers" are not members.

When compiling the statistics, we have used a broad interpretation of the concept of waste. There are more production residues in the statistics that should probably be classified as by-products instead of waste, in accordance with the Commission's Interpretative Communication[39]. For example, wood waste occurs in the wood products industry (NACE DD) and is sold to heating plants, papermills and pulp mills. We found out that about 18 000 ktonnes of wood waste occurred in NACE DD. Approximately 150 - 200 ktonnes of this is estimated to be "real" waste, whilst the rest is deemed to be by-product. According to our results, about 3 000 ktonnes of wood waste were incinerated in NACE DD. 100 ktonnes of this is estimated to be real waste whilst the rest is deemed to be by-product in accordance with the Commission's Interpretative Communication. 8 900 ktonnes of wood waste from sawmills are also recycled in the pulp industry. Applying a strict interpretation of the Communication, all this quantity is by-product and not waste.

A description of how household waste is confused with general waste from shops/offices is given in Appendix 10 Households.

2.2.1.1 Coverage errors regarding the population

Under- and overcoverage problems that have been detected in connection with the collection of data include local units with incorrect NACE codes in the Business Register and out-of-date information in the Business Register on local units that are no longer active or new enterprises starting during 2006 or earlier (undercoverage).

It has been discovered in the questionnaires submitted that several of the local units have incorrect NACE codes in the Business Register. Respondents have been asked in the questionnaire to describe in words the type of work carried out at the local unit and this can differ greatly from the industry code they have been given in the Business Register. When they have no operations that belong to the mining or manufacturing industries (NACE C+D) according to their own description, they represent overcoverage.

Some local units with the primary code NACE D have stated in their questionnaire responses that some of the waste has been disposed of at their own landfill site. If, when asked directly, respondents have said that the landfill site is located within the same area but constitutes a separate local unit, we have decided that the landfill site should belong to the frame for NACE 90 and hence be included in the survey directed at landfill sites in NACE 90.

There are also cases where the incineration of waste is carried out at a facility close to the local unit within a manufacturing industry (NACE D) but which is owned/managed by an enterprise classified under Electricity supply (NACE E). In these cases, we have checked with the survey on NACE E to see if the facility is reported there. If not, it can remain in the present questionnaire.

[39] COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on the Interpretative Communication on waste and by-products Brussels, 21 Feb 2007. COM(2007)59 final

In this year's survey of NACE C and D, the following sectors and sub-sectors have not been surveyed using questionnaires at all:

- Mining and quarrying (NACE C)
- Manufacture of textiles and textile products, and Manufacture of leather and leather products (NACE 17-19)
- Manufacture of coke, refined petroleum products and nuclear fuel (NACE 23)
- Manufacture of detergents and toiletries (NACE 24.5)
- Manufacture of office machinery and computers (NACE 30)
- Manufacture of radio, television and communication equipment and Manufacture of medical, precision and optical instruments (NACE 32-33)
- Manufacture of furniture and other manufacturing n.e.c. (NACE 36)

For NACE C and NACE 23, data were compiled for the largest local units this time from environmental reports, whilst data from 2004 were reused for the smaller ones. For the other sectors/sub-sectors, 2004 data were reused, since these are only of marginal significance for the statistics.

2.2.1.2 Coverage errors regarding waste quantities

The methods used are intended to give 100% coverage of waste generated and treated, including capacity data. There is no reason to suspect that over- and undercoverage occurs to a greater extent than that which is described under the errors noted below.

Data can be included twice in several ways. Some of the main examples of these are:

- Construction and demolition waste does not only arise in the construction industry but also in the manufacturing industry.
- A type of waste can be treated several times, within or outside a sector. Sometimes the waste classification changes after treatment and sometimes it does not.

2.2.2 Measurement errors

Common problems we encountered when collecting data in the questionnaire surveys in NACE D include:

1) The EWC-Stat coding of certain hazardous waste has been unclear and confused, e.g. the difference between Spent solvents (EWC-Stat 01.1), Chemical preparation wastes (02) and Chemical deposits and residues (03.1) can be unclear for many respondents.
2) Waste that contains oil can be classified under several different codes according to EWC-Stat;
3) There has often been confusion between the three EWC-Stat codes Household and similar waste (10.1), Mixed and undifferentiated materials (10.2).
4). Sludge has occasionally been incorrectly classified: Industrial effluent sludge (03.2) should be coded as Common sludge (11) or vice versa;

5) A large number recorded the occurrence of hazardous metallic waste (06). The majority of these have actually been other types of waste, i.e. non-hazardous metallic wastes (EWC-Stat 06) or hazardous chemical preparation wastes (EWC-Stat 02), such as metal packaging contaminated with oil. We have conducted a special investigation into each case when hazardous metallic waste has been reported in order to verify that it really should be classified as such;
6) Many who have answered yes when asked whether waste treatment has occurred at the local unit had, when asked directly, only sorted the waste or performed some other form of pre-treatment, e.g. reduction of waste by evaporation, which should not be reported here as treatment.

The statistical object applicable in the survey is "local unit". Statistics Sweden's Business Register has been used, which means that local unit and not activity unit is the applicable statistical object in the survey. There is therefore a risk that several types of activities can occur at the same local unit. This is only a problem if the combination of activities leads to a classification under NACE codes outside the reporting sectors. We do not know how great this particular problem is and we do not have a method or the intention of solving it. This does not have any influence on the total amount, but may have on the distribution of waste between different sectors.

Estimated values have been permitted in the survey. This can affect the precision regarding quantities.

The questionnaire for the sample surveys in NACE D has been tested in three ways prior to this year's survey:

- The questionnaire from the previous questionnaire survey formed the basis for the sector-specific questionnaires this time after evaluation of its success, e.g. examining the comments received from various respondents;
- The Statistics Sweden measurement technology lab has reviewed the design, content and clarity of the forms and covering letters;
- Questionnaires and covering letters have been reviewed and approved by the Board of Swedish Industry and Commerce for Better Regulation (NNR) and the Swedish Association of Local Authorities and Regions (SALAR);

Possible errors can also occur when respondents write incorrect responses in the questionnaire. Incorrect responses can be due to carelessness or misunderstanding of the respondents. When checking the questionnaires, we have carried out a rationality test: is the type of waste reasonable for the sector, is the size given reasonable, is there some other type of waste that should occur in the sector, etc. In several cases, we have detected relatively large errors in the submitted responses, which we then were able to rectify. There can however still be incorrect responses that we have not detected. It is hard to quantify these errors as we have made a lot of effort to eliminate them.

Recycling at the same site where the waste was generated (known as "internal recycling") has caused respondents several interpretation problems and led to possible errors in their responses. According to the waste statistics regulation, neither the existence nor the recovery of these quantities should be reported but respondents can have included this in their responses without it being detected.

2.2.3 Processing errors

When registering submitted questionnaire responses in the processing database, there has also been a risk that the data are input incorrectly. In most cases, it has not been possible to detect small errors of this kind. Larger errors, such as errors in the number of zeros, have probably been detected in most cases when a thorough analysis of the survey results is carried out, with aggregations of various kinds, such as by sector, size category and type of waste. The comprehensive checking procedure consisted of several stages: estimates of rationality by various experts, comparisons with the previous survey and comparisons with other data sources where possible, such as environmental reports from licensed facilities. These methods have also occasionally led to the amendment of certain variables or imputation when there is partial non-response.

It is not easy to detect coding errors related to waste types. Many of the suspected errors have been dealt with via telephone or e-mail contact directly with respondents. A number of obvious errors have been detected by the checking experts, for example that some processes within a NACE code should result in a certain type of waste, such as metallic wastes from the manufacturing of metallic goods and plastic wastes from the manufacture of plastic goods (when the waste is not recycled into the own processes as this should not be counted as waste generated nor reported as internal treatment). Respondents are directed in the covering letter to a website where a list is provided to help convert codes from those included in the list of waste to EWC-Stat, which can be used when coding waste. We suspect that the majority of respondents have not used this conversion table. This means that, although they have classified their waste according to the list of waste, this waste has not always ended up in the correct EWC Stat-code. Finally, processing errors that have not been detected when checking remain as well as those that we have ourselves incorrectly amended when we have suspected an error and not received any response from the respondent on the issue.

Waste treatment of mineral waste in the mining sector, were classified as landfilling, regardless of what the local unit does with this waste. One larger local unit in the mining industry (NACE C) stated that some of the mineral waste is recovered because it actually substituted another material.

Some local units have had large quantities of pre-treated water-containing oil waste. This treatment consists of the separation of oil and water using various physical-chemical methods. The water phase is often released via the sewers into a watercourse or a municipal sewage facility after purification, and the oil phase is sent on to an oil waste facility. We have considered that, for this process, the treatment (separation) should not be reported according to the regulation on waste statistics (D9). Generated waste is made up of oil waste. In cases where the water

phase is treated (which is the norm), the treated water is not classified as waste when it leaves the facilty. Untreated water is however classified as waste. The treated waste is only the untreated water that is released into watercourses (D6, D7). If the water is released to a municipal sewage facility, this is not reported as treatment.
Many respondents have submitted data on generated quantities of waste, often small quantities, in the "Other waste" section of the questionnaire. Where the respondents have noted the type of waste in words, we have moved this value to the appropriate EWC-Stat code. In other cases, we have mostly moved the value to Mixed, undifferentiated material (10.2), unless the local unit was included in the previous survey and we were able to see from this which type of waste it was.

The existence of hazardous metallic wastes (06) for which some have filled in values, have in some cases been moved to non-hazardous metallic wastes, i.e. when the same local unit has also noted treatment of non-hazardous metallic wastes. In other cases, the value has been moved to hazardous chemical preparation wastes (02), where oil-contaminated metallic barrels belong

Many have written "fluorescent tube" beside the waste type Hazardous discarded equipment (08) and noted "items" instead of a weight measure. We have converted to a weight measure using 0.2 kg/item. In the majority of cases where the number given is relatively large, we have additionally assumed that submitted data in "items" for waste type 08 (hazardous) without any description in words refers to fluorescent tubes and converted as above.

Coding errors related to regions are not relevant for this survey as the sample has been drawn from the Business Register, where the object is local unit with county and municipality codes.

2.2.4 Non response errors

The total response rate for the various questionnaire surveys in NACE 10-36 was 74 percent on average. This response rate includes overcoverage that was detected when checking the submitted questionnaires and questionnaires sent in without any data, e.g. when the respondent refused to respond, or when local units have recently ceased to exist or are inactive.

Object non-response problems have been addressed using written reminders sent on two separate occasions to respondents that have not responded and, thereafter, telephone reminders to larger local units within the sector that have a particularly low share of responses. These efforts have given mixed results. Many pointed out that the survey is optional and that we should instead contact the supervising authority to obtain an environmental report in which the waste data should be reported. As the Swedish Environmental Protection Agency did not wish us to contact the county administrative boards, no action has been taken. For some larger local units that did not respond in 2004, we ordered environmental reports from the county administrative board in advance. This was done so that we could impute values from these reports even if there was object non-response this time round.

In order to reduce partial non-response and to check uncertain data, direct contact has been made with respondents by e-mail or telephone. Checks and imputa-

tions to reduce non-response have also been made using certain calculations and other sources such as environmental reports and the 2004 industrial waste survey.

Methods used on partial non-response, when we have not succeeded in persuading respondents to report themselves, have primarily concerned:

- Dry weight for sludge (both common and industrial effluent) has been assumed by deriving a factor dry weight/wet weight from all local units that have submitted data on both. Every wet weight for which a dry weight is missing has then been multiplied by this factor.
- Where values for both Household waste (10.1) and Mixed and undifferentiated materials (10.2) are missing, the former has been calculated partly from the results of the 2004 survey and partly using the kg per employee factor. This factor, 100kg/employee, has thereafter been calculates based primarily on the submitted information on employees and secondly on the number of employees registered in the source register, the Business Register.
- Data on capacity for the various treatments have often not been given by respondents. When reminders have not succeeded, we have in some cases been able to use environmental reports to obtain these data. In most cases, calculations have been done instead. For landfill sites, it has been assumed that there are 5 years left for landfilling waste and there will be the same treatment quantities as given in 2004. A recalculation from tonne to m3 has been done for types of waste for which it is considered that the weight will differ considerably from 1 ton/m3. For other treatment methods, it has been assumed that the capacity is the same as the treatment quantity rounded up. For supplementing according to Mayer Parry (see section 2.2.1), it has been assumed that capacity data for certain types of material are equal to the recycled quantities, rounded up, when data have not been obtained directly from the sector organisations contacted.

Non-response has led to problematic quality issues, despite great efforts in many different ways to reduce it. No investigation has been carried out into whether there is any significant difference between waste quantities in the non-response group and the response group, i.e. if the survey's results are distorted.

2.2.5 Model assumption errors

To reduce both costs to society and the burden on respondents, the various questionnaire surveys have been conducted as stratified samples. All local units with at least 100 employees were included in the samples for the various sub-sectors. For local units with less than 100 employees, the sample has been drawn using a variety of methods for the different NACE industries. The cut-off limits used are local units with 10, 20 and in one case 100 employees, depending on the sector. Over these limits, the number of employees at a local unit determined the probability of being included in the sample. Extrapolations were then carried out for every sector to obtain a total waste quantity over the cut-off limits. The number of employees

has then been used as a factor for calculating waste quantities generated for local units under the cut-off limits to achieve 100% coverage of waste quantities. Our basis assumption has been that no recovery or disposal that must be reported in accordance with Annex II of WStatR occurs at these small local units.
Errors can have occurred in different ways. Two examples of this:

1) There can be a poor correlation between the number of employees and waste quantities. This risk becomes less and less with every survey carried out so that better models can be developed to simulate the connection between waste quantities and number of employees in the different NACE groups and size classes.
2) Some of the objects in the sample could be extreme in some way. As the values for these objects are then multiplied by a factor of 10 or more, when the sample has been sparse and there may also have been large non-response, the result can be a large over-evaluation of a particular type of waste. This risk for error is not easy to detect if the error is not so large that experienced waste and industry experts can detect it when checking various compilations. Even if this type of error is detected, it has not been clear how it should be handled so it often remains as it is.

2.2.6 Other errors affencting accuracy

The questionnaire has been sent to the person responsible for environmental issues at the local units. It is possible that another person could be able to fill in the questionnaire more accurately or that non-response would be less if another person is addressed. In some specific examples, we have received two questionnaires from the same local unit with different data (normal and reminder), either from the same respondent or two different respondents.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

VALIDATION OF DATA REGARDING TREATMENT OF WASTE

Data on waste treatment facilities within NACE C+D have been double-checked against other administrative data (environmental reports etc.). The compiled results have also been quality controlled and validated by independent experts.

STATISTICAL UNITS

The objects are local units that, because the Business Register has been used, correspond to a local unit with a county and municipality code.

MOBILE WASTE TREATMENT

For the generation of waste and the recovery and disposal of waste, mobile equipment has been reported in the place it was used. Capacity data have, however,

been reported in the home town. We have only come across a few mobile units in the survey on NACE C+D so the facility's location does not have a determining significance for the total reported quantities of waste or treatment capacities.

Appendix 5

Energy, gas and water supply (NACE E)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

The sector NACE E consists of two main sections; electricity, gas, steam and hot water supply (NACE 40, hereafter called energy sector) and the collection, purification and distribution of water (NACE 41, hereafter called water supply sector).

Most **waste** treatment in the sector is carried out at facilities producing energy from the combustion of different types of waste fuels and secondary fuels. Energy production from the combustion of all kinds of fuels also gives rise to a large part of the waste that is generated in the sector. For these enterprises within the energy sector (NACE 40), a questionnaire survey has been carried out.

For other types of activities within the energy sector (NACE 40), waste data have been obtained using other methods, see below.

The statistics produced for the sector are consequently based on data collected using different methods depending on what type of activity the enterprise has.

1.1 ENTERPRISES WITH ENERGY PRODUCTION FROM COMBUSTION

These enterprises come under NACE 40.1 (the production and distribution of electricity) and 40.3 (steam and hot water supply). Also included are all enterprises with some form of heating plant or combined heat and power plant that use municipal solid waste as fuel. The population includes only those enterprises with combustion facilities. The frame is made up of the energy statistics' register for the survey on annual energy statistics[40].

In order to guarantee data collection from the 31 heating and combined heating and power plants that incinerate household waste and other municipal waste, some of them that were missing from the population above were identified using details from Avfall Sverige[41]. Furthermore, plants of this kind that were part of larger energy enterprises were also identified. Questionnaires were then sent to these facilities as well.

For checking, supplementary information and corrections of the data received from the questionnaire responses, the following sources have been used:

- Data from the energy statistics survey "Annual energy statistics (electricity, gas, heating)" regarding 2006

[40] Direct information from Statistics Sweden, Energy, Transport and Road-User Unit.
[41] "Swedish Waste Management 2007". Avfall Sverige (Swedish Waste Management), publication. www.avfallsverige.se

- Environmental reports via SMP
- The Avfall Sverige website and the "Swedish Waste Management 2007" report
- Websites of relevant enterprises and municipalities
- Statistics Sweden's Business Register
- www.novator.se/bioenergy/facts/ website with facts about bioenergy

The questionnaire survey included quantity of incinerated waste (excl. tall pitch oil) and the generation of waste from incineration and quantity of metal separated from the waste before incineration or slag/bed ash.

Quantities of incinerated tall pitch oil (classified as EWC-Stat 03.1 Chemical deposits and residues) were collected from the energy statistics.

For generated quantities of types of wastes not requested in the questionnaire survey, projections of 2004 data were used.

The capacity for incinerating waste has been assumed to be identical to the quantity actually incinerated, which has probably leads to available capacity being slightly underestimated.

Waste treatment other than incineration occurs at a few facilities. Treated quantities and capacities for these have been obtained through direct contact with the relevant facilities or estimated from previous data.

1.2 NUCLEAR POWER PLANTS

Projections of data from WStatR 2006 based on electricity production from the sub-sector in 2006 compared to 2004.

1.3 MANUFACTURE OF GAS

Reuse of data from WStatR 2006.

1.4 HYDROELECTRIC POWER STATIONS

For landfilled quantities and landfilling capacity, data from WStatR 2006 were reused and projections of the previous survey based on electricity production in 2006 compared to 2004 were made for other data.

1.5 WIND POWER STATIONS

Projections of data from WStatR 2006 based on the number of wind turbines in 2006 compared to 2004.

1.6 ELECTRICITY NETWORK ENTERPRISES

Waste is generated by electricity network enterprises primarily when building new networks or renovating the electricity supply mains with its distribution apparatus.

Contact has been taken with a few large and some smaller electricity network enterprises that submitted data on quantities of generated waste. These data, together with data on the combined length of different types of electricity network,

have been used when calculating the waste quantities of these operations. Waste treatment is not relevant in this sub-sector.

1.7 ELECTRICITY TRADE ENTERPRISES

Generated household waste and office paper waste are included in the quantities compiled for NACE E as a whole and no further surveys have therefore been performed.

1.8 WATER SUPPLY

Reuse of data from WStatR 2006.

1.9 GENERATED HOUSEHOLD AND OFFICE PAPER WASTE FROM THE ENTIRE SECTOR

The quantity of household and similar waste from the sector as a whole has been estimated using the waste factor "quantity per employee", developed as part of a project in the spring of 2007. Data on total number of employees have been collected from the Statistics Sweden Business Register.

The quantity of generated office waste has been estimated by using the waste factor "quantity per office employee". The quantity has been compiled in a report within NACE G-Q during 2007[42].

2 Accuracy

2.1 SAMPLING ERRORS

The questionnaire survey to enterprises producing energy by fuel combustion is a total population survey. Sampling errors therefore do not occur.

2.2 NON-SAMPLING ERRORS

Sections 2.2.1 to 2.2.5 inclusive discuss sources of error for the questionnaire survey to combustion enterprises. Sources of error in the other sub-surveys are dealt with in Section 2.2.6.

2.2.1 Coverage error

The method used is designed to ensure 100% coverage of waste generated as well as recovered and disposed waste.

2.2.1.1 Coverage error regarding population

The frame for the questionnaire survey is taken from the energy statistics register. The statistical unit in the register is enterprise. The energy statistics survey is a total population survey in which respondents are legally obliged to provide data. The register contains additional information on the energy production units that is

[42] ARAP – Utredning om användning av avfallsfaktorer. SMED 2007-01-15 (in Swedish)
Metodrapport för insamling av avfallsdata inom tjänstesektorn 2007-01-26.

included in each enterprise. Under and overcoverage errors very occasionally occur when enterprises or production units are missing or have incorrect NACE codes in the register.

The surveys for other industries are carried out in a variety of different ways. To a large extent, the frames for these surveys are taken from the Business Register. The statistical unit is thus local units whose main activity lies within the relevant sector. This can cause different types of coverage error:

1) Some enterprises with a NACE code other than 40 can have local units within NACE 40. This can imply undercoverage.
2) Some enterprises within NACE 40 can have local units with a different NACE affiliation. This would imply overcoverage.
3) Some enterprises, municipal enterprises in particular, have different types of technical operations within the same enterprise. The enterprise can therefore carry out district heating operations as well as the collection and treatment of refuse, sewage treatment and the supply of drinking water. Trade in electricity and electricity network operations may also be included. The risk of overcoverage is however small since only incinerated waste fuels and some generated wastes that are specific to incineration plants are requested in the questionnaire.
4) Large energy enterprises give rise to special coverage problems due to them responding on behalf of many facilities. Recently acquired or divested facilities and part-owned facilities can lead to over- or undercoverage. Furthermore, they have or operate some facilities for production of steam for other industrial enterprises, which don't always belong to NACE E.

The following measures have been taken to minimise the risk for coverage errors:

- On the back of the form, respondents could mark which facilities the data referred to. This made checking easier since an assessment could be made of any facility was missing or had been added.
- The covering letter and the questionnaire highlighted the fact that data should refer to combustion plants within the enterprise.
- In suspect cases, a check was made against NACE 90 and/or NACE C +D to clarify which sector a facility should belong to.
- For enterprises with household waste incineration facilities, special checks were made of the relevant heating plant's sector affiliation in the Business Register and of the enterprise's website.
- These checks revealed the following:
  - Two facilities/stations that should have been in the frame - their submitted values in the energy statistics were imputed into the survey
  - Four enterprises that should have been in the frame - Data were found in the energy statistics and in one case, direct contact was taken, after which imputations into the survey were made.

The remaining errors caused by overlapping frames or poor coverage in relation to other industries are estimated to be small.

Coverage errors between the questionnaire survey and other sub-surveys should not occur.

2.2.1.2 Coverage errors regarding waste quantities

The method used is designed to ensure 100% coverage of waste generated as well as waste quantities treated and capacity data:

- In the questionnaire survey, data on incinerated waste fuel, waste generated from incineration and unsorted metal were requested. Other types of generated waste are calculated using the results in WStatR 2006.

It is possible for data to be reported twice for several reasons, as described in the main report. For the energy and water supply industry (NACE E), these errors are deemed particularly significant:

- Construction and demolition waste not only appears within the construction industry but also in the energy and water supply industry (NACE E). There is particular risk for reporting data twice for new construction and renovations as these activities are partly carried out by contractors.

Consequences of the Commission's Interpretative Communication

According to the broad definition of waste which we used in the surveys for WStatR 2008, large quantities of non-hazardous wood waste in the form of e.g. off-cuts from sawmills were incinerated at facilities in NACE E. Most of this off-cut material should probably not be counted as waste according to the Commission's Interpretative Communication from February 2007. The "Incinerated wood waste" item in the statistics also includes certain quantities of wood waste that still should be counted as waste despite the Commission's new interpretation. According to the statistics, 5 150 ktonnes of wood waste were incinerated in NACE E. Approximately 810 ktonnes, about 16% of this, is deemed to be "proper wood waste". The rest is off-cuts that could be classified as by-product according to the Commission's communication.

Furthermore, large quantities of animal and vegetal waste (EWC-Stat 09) in the form of harvesting residues, thinning residues, etc., from forestry are incinerated at facilities in NACE E. According to the statistics, 2 930 ktonnes of animal waste were incinerated. In our opinion, basically all of this could be deemed by-product in accordance with the Commission's communication.

2.2.1.3 Interpretation and definition of incineration capacity

Defining capacity for the incineration of waste in an unambiguous and relevant way is a problem for this sector. Many qualities of wood waste are, when used as fuel, equivalent to other wood fuels. Because incineration is almost exclusively carried out to produce district heating and, to a certain extent, electricity, the maximum fuel consumption of a facility is not a relevant measurement of annual

incineration capacity. Annual fuel consumption is instead determined by the need for heat production. The corresponding problem also exists for tall pitch oil.

The capacity to incinerate waste has been set equal to the quantity of waste incinerated during 2006. The regional distribution of the capacity has been effected with the help of data on the facilities' sector affiliation from the energy statistics. The number of facilities that are capable of incinerating waste and their regional distribution have been obtained from the energy statistics. Facilities that have used wood fuel, refuse, tall pitch oil or peat as fuel are assumed to be able to burn waste fuels. The methodology is only applicable since fuels such as off-cuts and harvesting residue are to be counted as waste.

As the survey was carried out at enterprise level, there is some risk that the number of facilities that can incinerate waste has been somewhat underestimated.

2.2.2 Measurement errors

The questionnaires used have been designed on the basis of experiences from WStatR 2006 and from similar questionnaire surveys in NACE C + D. The questionnaire design was tested by the Statistics Sweden measurement technology lab prior to the start of the survey.

Terminology that is well known in the sector was used on the questionnaire form. Instead of EWC-Stat codes, self-defined codes were used and description often contained examples that clarified what was intended. This reduced the amount of incorrect or doubtful data that can be hard to detect when checking. Despite this, it is likely that some respondents have not submitted data on the incineration of certain wastes. This relates primarily to fuels that respondents often consider by-products or secondary fuels.

Via our website, to which we refer in the covering letter, respondents had access to complete lists of codes (codes in the list of waste and which EWC-Stat codes these were equivalent to).

Some respondents have not been able to report wood fuels that should be classified as 07.5 Wood waste and 09 Animal and vegetal waste separately. In these cases, we have done a standard breakdown.

Some respondents have made use of the option of noting fuel types and quantities without codes because of uncertainty as to which group the fuel belongs. In these cases, we have interpreted which fuel was meant ourselves. In most cases, there has been no doubt as to which fuel type it should be, but some uncertain interpretations may have been made.

Precision in the given values in the questionnaire responses is difficult to specify as estimated values have been permitted in the survey. Quantities are requested in tonnes. Some data have been submitted in other units and we have converted these. As far as possible, we have used the same conversion factors as used in all surveys.

Incorrect responses can be due to carelessness or misunderstanding of the respondents. When checking the questionnaires, we have carried out rationality tests and compared data to the energy statistics and any environmental reports. It is likely that there are errors that we have not detected.

For combustion wastes (EWC-Stat 12.4), a rationality test has been carried out by comparing to an estimated ash quantity. The quantity of ash has been estimated from the quantity of consumed fuel taken from the energy statistics.

The quantity of combusted waste has been checked against other sources (energy statistics and data from Avfall Sverige).

Incineration capacities and number of facilities that incinerate waste have been systematically slightly underestimated. This is due to the capacity being considered as large as the quantity incinerated.

Despite all checks, there is a risk that incorrect data can have been included as a basis for the reported statistics. Respondents have had certain problems when filling in data in the questionnaires. One reason for this is that the data corresponding to the content of the questionnaires have not always been readily available as the enterprises e.g. report used fuels without considering the definition of waste.

2.2.3 Processing errors

When registering the submitted questionnaire responses in the working database, there has been some risk that data have been coded incorrectly. The inputs have been checked but some occasional errors may have been missed.

2.2.4 Non response errors

In the questionnaire survey, 232 questionnaires were sent out and three other enterprises were added during checking. After supplementary data was compiled from e.g. websites and environmental reports, the response rate was 86.4% (203 out of 235).

For enterprises that did not submit data, or that submitted incomplete data, the following supplementary work was carried out:

1) The quantities of combustion wastes (12.4) generated have been estimated using data on fuel consumption in the energy statistics
2) Supplementary data from websites and environmental reports
3) Supplementary data on use of fuels from the energy statistics and incinerated waste from Avfall Sverige
4) Non-response extrapolation based on number of employees at responding and non-responding enterprises respectively.

Supplementary data were compiled primarily for large facilities

2.2.5 Model assumption errors

Not applicable for the survey method used.

2.2.6 Other errors affecting accuracy

2.2.6.1 Energy production from combustion

The questionnaire was sent to the environmental officers in each enterprise. It is possible that the response rate and accuracy of the data would have been better if the questionnaire had been addressed to an appropriate, named individual.

In addition to waste incineration, the questionnaire survey also covered the generation of some types of waste. Data on other types of waste generated were obtained by projecting 2004 data.

2.2.6.2 Nuclear power plants

Data from all nuclear power plants for 2004 were obtained from environmental reports. This year, these data were projected using electricity production data from the sub-sector.

2.2.6.3 Manufacture of gas

The manufacture of gas produces relatively small quantities of waste and the data compiled in the last survey was reused without being projected.

2.2.6.4 Hydroelectric power stations

For WStatR 2006, data for the seven largest hydropower enterprises were obtained via interviews or via environmental reports. According to Swedenergy, these selected enterprises represent around 90% of the hydroelectric power production in Sweden. Extrapolations were made to estimate remaining hydroelectric power stations. For this year's survey, these data were projected using electricity production data in the sub-sector.

2.2.6.5 Wind power stations

For WStatR 2006, the statistics were based on contact with the Swedish Wind Energy Association and thereafter expert assessments. These data were projected in this year's survey based on the number of wind turbines in 2006 compared to 2004.

2.2.6.6 Electricity network enterprises

The quantity of generated waste from this type of activity is based on data collection from some of the largest and some of the smaller enterprises in the sector. Waste factors have been developed using data on the length and the type of the electricity supply mains (overhead lines or underground cables and voltage distributed). Using these factors, the quantity of waste generated by Sweden's entire electricity network has been estimated. Both the stem network and regional and local networks are included. There is probably a relatively amount of uncertainty in the estimates.

2.2.6.7 Electricity trade enterprises

The quantity of household waste and office paper waste generated is included in the estimates for the sector (NACE E) as a whole. Other waste quantities are deemed negligible.

2.2.6.8 Water supply

For 2004, data were obtained from a special, less extensive questionnaire survey sent to 12 larger waterworks. These data have been used to determine production-based waste factors. Svenskt Vatten (the Swedish Water & Wastewater Association) participated in the implementation and evaluation of the survey. These data were reused for 2006 waste figures.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

VALIDATION OF DATA REGARDING TREATMENT OF WASTE

All facilities in Sweden that incinerate household waste and similar wastes are included in the survey. The data are of good quality and have been checked against data from Avfall Sverige.

Waste treatments other than incineration only occur occasionally within the sector (NACE E).

The compiled results for the treatment of waste within the sector (NACE E) have been quality controlled by independent experts.

STATISTICAL UNITS

The survey object is enterprises with the energy statistics register as a frame. The register contains information on the production units of the different enterprises including where they are located, i.a. municipality code.

MOBILE WASTE TREATMENT

It has not been clarified if any mobile equipment has been used in this sector. Such activities should not really occur within this sector other than a special business on the side.

Appendix 6

Construction (NACE F)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

A panel of experts has been used to compile data on waste from construction. The same method was used in the first report in accordance with WStatR 2004[43]. No statistical measurements of generated construction waste in Sweden have been done before. Various estimates of the quantities have however been made on several occasions. The idea with the expert panel was to gather experts together who had participated in these estimations or who in some other way had good knowledge of construction and demolition waste, and could therefore make an overall assessment based on different starting-points. By weighing up the assessments from these various starting-points, it was felt that a sufficiently accurate estimate of the quantity of construction waste could be made. The work has been divided into the following activities:

1. PREPARATION OF BACKGROUND MATERIAL

Data on generated waste quantities were gathered from different sources by SMED. These data were compiled as background material for the expert panel, as described in Section 2 below.

2. EXPERT PANEL

An expert panel made an assessment of waste quantities based on the background material prepared. The panel consisted of experts from the waste sector, construction industry, authorities, consultants and researchers, who participated in a one-day workshop at the Swedish Environmental Protection Agency. The panel was of the opinion that the main background material should be made up of the regional survey of waste quantities in the construction sector conducted by the waste company SYSAV and that some supplementary information should be added.

[43] Results from the first report are presented in a special project report WStat 2006: Waste from NACE F – construction, Jan-Olov Sundqvist, Åsa Stenmarck, SMED, September 2005.

3. APPLICATION OF AND SUPPLEMENTARY MEASURES ACCORDING TO THE EXPERT PANEL'S ASSESSMENT

The regional survey of waste in the construction sector was extrapolated to the national level based on construction intensity data. The statistics were then supplemented as follows (also in accordance with the expert panel's assessment):

- The quantity of dredging spoils was not included in the regional survey. Data were therefore obtained from the survey of the NACE 90 sector, in which dredging spoils are treated. The quantity generated in NACE F was assumed to be the same as the quantity treated in NACE 90.
- The regional survey did not cover waste from civil engineering works. For this reason, the data on generated waste from the Swedish Rail Administration and the Swedish Road Administration, collected for the preparatory background material, were included.
- Certain sorted fractions were reported in the regional survey as one fraction: glass, plastic, cardboard, electrical scrap. These were assumed to be broken down in the same way as the corresponding waste types from the construction enterprise JM (the background material was deemed to be of good quality). The breakdown was 15% glass, 9% plastic, 56% cardboard, 20% electrical scrap.
- The regional survey presented only the total quantity of hazardous waste generated, without any breakdown by type of waste. The quantities were therefore broken down into separate waste-types based on data from the Kretsloppsregister. The breakdown by waste-type was assumed to be the same as the one registered for the construction sector for 2006 in the Kretsloppsregister.
- Household waste and office paper were not included in the regional survey and were therefore calculated using waste factors developed by SMED.

2 Accuracy

In the report to WStatR 2006 regarding 2004, a comprehensive survey to examine waste generated in the construction sector (NACE F) was performed for the first time. The expert panel method was also used for this survey. However several partial estimations have previously been done, covering several types of waste in some sub-sectors. The idea with the expert panel was to gather experts together who had participated in these previous estimations or who in some other way had good knowledge of construction and demolition waste, and could therefore make an overall assessment based on different starting-points. By weighing up the assessments from these various starting-points, it was felt that a sufficiently accurate estimate of the quantity of construction waste could be made. The methods used are deemed to give roughly a 25% level of uncertainty, both regarding the generation of waste and the recovery and disposal of waste.

The expert panel based its assessments on a synthesis of several different sources that used different methods, compiled by SMED. The methods included in the background material are:

1) Survey of waste flows in a region in Skåne, performed by the regional waste company SYSAV. The data were based on the waste quantities assumed to have been generated from the construction sector and treated either in SYSAV's own facilities or in those of other major actors in the region. Waste from civil engineering works and dredging spoils are not included.
2) Projection of corresponding statistics for 2004 using the sector's conversion index.
3) Collection and compilation of data on generated quantities of waste in 2006 from six of the largest actors in the sector: Skanska, NCC, PEAB, JM, Swedish Rail Administration and Swedish Road Administration.
4) Calculations of waste generated in the construction sector (excluding civil engineering works) using waste factors and data on building production. The waste factors have been developed by the Ecocycle Council (Swedish Construction Federation).
5) Statistics from the Kretsloppsregister's data on transported hazardous waste in Sweden 2006. By estimating the Kretsloppsregister's coverage rate, we can extrapolate the total quantities in the country as a whole.

The largest uncertainty in the statistics is thought to depend on uncertainties in the definition of waste. There is particular uncertainty about when dug-up soil (classified as mineral waste) constitutes waste and when it constitutes a product.

Another significant uncertainty concerns the breakdown of the hazardous waste generated into different types of waste. The breakdown has been obtained from the Kretsloppsregister which only covers some of the transported hazardous waste in Sweden. The total quantity of hazardous waste is therefore deemed to be less uncertain than the separate hazardous waste-types.

Similarly, the total quantity of glass, plastic, cardboard and electrical scrap is deemed less uncertain than the quantities of these waste-types taken separately. This is because the breakdown between generated glass, plastic, cardboard and electrical scrap has been obtained from just one construction company.

2.1 SAMPLING ERRORS

Not applicable for this sector.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

Estimations cover the entire sector of NACE F and all existing types of waste. The quantities of waste in the Skåne region refer as far as possible to waste that has been generated in construction activities. Since typical construction waste can also occur in other sectors, such as in households that build or renovate property them-

selves, there is a risk of such waste also being included (risk of overcoverage). Furthermore, a lot of construction sector waste is treated at the same facilities as waste from the manufacturing industry (e.g. sorting facilities) and it may therefore be unclear as to in which sector the waste was generated. It is not known whether this causes under- or overcoverage, however.

2.2.2 Measurement errors

Not applicable for this sector.

2.2.3 Processing errors

Not applicable for this sector.

2.2.4 Non response errors

Not applicable for this sector.

2.2.5 Model assumption errors

The methods used are based on two different models:

- Survey of waste flows within a particular region, which are then extrapolated to the national level based on construction intensity. The basis of the figures presented is a survey of waste flows in a region in Skåne.
- Calculation of parts of some waste-types using waste factors. The waste factors have been developed by SMED and are deemed to be of good quality.

Both these models lead to simplification of reality. Waste flows have been extrapolated using data on construction intensity in economic terms, which should lead to less error compared to extrapolation based on population figures. One simplification is however that we have assumed the breakdown between different types of construction projects to be the same throughout the country (e.g. the ratio of new construction/demolitions/refurbishments of houses and civil engineering works). We have also assumed that the projects per invested Swedish krona generate the same amount of waste per waste-type.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

There is generally no recovery at construction sites except for excavated materials (classified as 12 Mineral wastes according to EWC-Stat 12). Other waste that is recycled is treated in facilities outside the construction sites (usually in Sewage and refuse disposal, etc. [NACE 90] or Manufacturing [NACE D]). Assessment by experts indicated that most of the excavated material is recycled. Internal recycling occurs is a few cases.

There is no measurement of the quantities of excavated material generated or of its recovery. We assumed that both the generated and recovered quantities of excavated material correlate to the number of building permits (dwellings, offices, industries). It was assumed that one building permit consisted of one local unit. The official building statistics at Statistics Sweden include information on the volume of construction and the number of building permits broken down by municipality and by county. Recovery was distributed among the various NUTS regions based on this information.

Appendix 7

Services (NACE G-Q, excl. 51.57 and 90)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

Four different sources have mainly been used:

- Individual respondents: sector agencies (Swedish Maritime Administration, Swedish Aviation Authority, Swedish Armed Forces, Swedish Rescue Services Agency), county council environmental managers, etc.
- Environmental reports from different facilities that conduct hazardous activities, principally Konvex who take care of animal by-products.
- Kretsloppsregister (for hazardous waste)[44]. A list of all consignors of hazardous waste transports, including their corporate ID numbers, has been obtained from the Kretsloppsregister. By matching this with the Business Register, industry codes for the consignors are obtained and we extracted enterprises that were registered in NACE G-Q excluding 51.57 and 90. Extrapolation was then performed to compensate for transports that were thought not to have been registered in the Kretsloppsregister. We assumed that the Kretsloppsregister covered 100% in municipalities that did not have an extended responsibility for hazardous waste, then we extrapolated the figures by number of employees in the service sector in municipalities that were not assumed to be covered by the Kretsloppsregister.
- Waste factors (for household waste, biodegradable waste and office paper). For household waste, a factor developed from questionnaire surveys in the manufacturing industry during the last statistics production project two years ago was used. Furthermore, special factors for campsite and hotel occupancy were used. For biodegradable waste from the trade sector, a factor from Avfall Sverige was used[45] for waste from the trade sector, restaurants, fast-food restaurants and institutional kitchens and one factor for returns from shops. For office

[44] The Kretsloppsregister is a system managed by Sveriges Åkeriföretag (Swedish Road Hauliers' Association). The system is voluntary. The members of the Kretsloppsregister send in electronically all their transport documents referring to completed transports of hazardous waste. The system is thought to cover about 50 - 60% of transports of conventional hazardous waste.

[45] Food waste from restaurants, institutional kitchens and shops. Key statistics with user manual. Report from the Association of Waste Management, 2006:7.

paper, a factor was developed based on the total quantity of office paper waste divided by the number of office employees in all sectors.

These sources do not provide complete coverage of the waste generated but are currently the best compilation available. The survey is focused on studying the flows of hazardous waste as well as types of waste generated in large quantities.

For the treatment of waste within the sector, the data can be assumed to provide 100% coverage.

2 Accuracy

2.1 SAMPLING ERRORS

Not applicable for NACE G-Q excluding. 51.57 and 90.

2.2 NON-SAMPLING ERRORS

Errors which occur for each source are summarised in table B5.2.

Table B7.2. Errors occurring in sources within NACE G-Q excluding 51.57 and 90.

Source:	Error
Kretsloppsregister	It is uncertain how much of the total waste quantity is covered by the Kretsloppsregister. Extrapolation to 100% is not entirely accurate since it is not known how well the Kretsloppsregister covers the municipalities that were used as base municipalities. There is also some potential error in the reporting from hauliers, i.e. incorrect waste codes. Industry coding is also deficient in that many corporate ID numbers do not have industry codes in the Statistics Sweden Business Register. Used activity data "Number of employees in the service sector, reference year 2005" may differ slightly from the corresponding data for the reference year 2006.
Environmental reports	Environmental reports are deemed relatively accurate. They may contain errors such as old waste classifications or classifications of their own. Interpretation issues then occur when these are to be converted to EWC-Stat.
The "household waste from operations" waste factor	The factor for household waste has been checked and is deemed relatively accurate. The factor has been extrapolated using "number of year-employees". These data have been obtained from the employment statistics and can be assumed to be of good quality.
	Two special factors have been developed (quantity per night) for household waste from hotel and campsite residents respectively.
The "office paper" waste factor	The office paper factor has been projected by taking the quantity of office paper waste divided by the number of assumed office workers. The quantity of paper waste is an accurate figure, although the number of office workers is an uncertain one.
The "biodegradable waste" factor	Avfall Sverige's waste factor has been projected from a same number of local units, which means accuracy is low. Furthermore, the waste factor should preferably be extrapolated using number of year-employees rather than number of employees, something which is not possible with the statistics available. Number of employees has instead been used.
	The waste factor for returns (of food) is based only on data from one respondent and cannot be deemed to be of such good quality. Several enterprises said that they didn't have data on this.
Other information	In many cases, data have come from sector organisations, sector agencies and the like. We believe these are good-quality data. It may however be the case that the sector has not requested a type of waste which we are looking for, for example.
	Data on end-of-life vehicles have been obtained using the vehicle statistics at Statistics Sweden. Data from all sectors apart from AB are included in the reported amount.

2.2.1 Coverage error

2.2.1.1 Coverage errors regarding the population

The survey is not a total population survey. There are activities that are not covered by the survey, i.e. we have a certain amount of undercoverage. We believe however that we have covered the activities that generate large quantities of waste and that generate hazardous waste.

As regards waste treatment, however, the survey is a total population survey like the one performed in 2004. We consider that all sub-sectors and local units that carry out waste treatment activities have been included, giving 100% coverage.

In the Kretsloppsregister, approximately 3.6% of the corporate ID numbers could not be matched with an SNI code in the Statistics Sweden Business Register.

Three small animal crematoria could not be contacted to obtain any data they might have had on waste treatment. However these can be considered to have only a minimal effect on the final result, as one of these crematoria is possibly inactive and the other two are believed to carry out minimal treatment activities.

2.2.1.2 Coverage errors regarding waste quantities

Regarding generated waste, we have an undercoverage of unknown size since we are not doing a total population survey. Our assessment is that the vast majority of the most important types of waste (hazardous, biological and household) and the most important sources are covered using the method employed.

Some types of waste may have been counted twice. This concerns sectors where we have obtained data from the sector itself for a number of sectors (on the two-digit NACE level) but for the rest have taken data from the Kretsloppsregister and waste factors.

2.2.2 Measurement errors

Sometimes, the reporting of quantities of waste to the Kretsloppsregister by hauliers can be incorrect. Some quantities have been reported in very large volumes, e.g. sewage sludge. We have not been able to go into the Kretsloppsregister in detail and analyse the reason for dubious quantities.

2.2.3 Processing errors

Two sources are environmental reports and surveys performed by the sub-sector itself. We deem these sources to be accurate. There may sometimes be interpretation difficulties when the results are to be converted to EWC-Stat codes. The respondents have often used their own waste categories that cannot be converted unambiguously to common waste codes or EWC-Stat codes. Combustible waste has for example been set equal to household waste (10.1) but could in practice be mixed, undifferentiated material (10.2). On the total level, however, the quality can be assumed to be good.

The waste factors used are extrapolated using four different data-sets:

- Number of employees (used for biologically degradable waste - i.e. EWC-Stat 09 Animal and vegetal waste). When number of employees

has been used, it has been set to one person at the local unit with zero employees, because we consider it impossible to have zero persons working. Part-time work is not considered, which can assumed to be a frequently-occurring phenomenon in e.g. the trade sector.

- Number of year-employees (household waste). To take part-time work into consideration, number of year-employees has been used instead of number of employees. Number of year-employees has been obtained from the employment statistics.
- Number of hotel and campsite residents has been obtained from SHR - Swedish Hotels and Restaurants Association.
- Number of office workers (office paper). Number of office workers has been developed using SSYK codes (Swedish Standard Classification of Occupations). From the SSYK codes, we have selected occupational groups that can be assumed to be linked to "office work". The procedure is somewhat uncertain and in practice, it is not just office workers who generate office paper waste. As a total amount, however, the figure can be assumed to be accurate.

2.2.4 Non response errors

Not applicable for this sector.

2.2.5 Model assumption errors

The waste factor for office paper is based on an assumption has been made about different occupational groups (according to SSYK codes) that can be assumed to be office workers. It is likely, however, that most people generate some form of paper regardless of whether they work with office-related tasks of more practical tasks. We believe however that the procedure of allocating by "office employee" leads to less error than merely assuming that all employees generate the same quantity of paper.

It is uncertain how well the Kretsloppsregister covers waste collection in the various municipalities. The extrapolation was based on 167 municipalities which we assumed had good coverage but it is impossible to assume how well they cover it. Hence, the extrapolation to 100% cannot be considered complete but is probably undercovered.

For household waste, a factor has been extrapolated using number of year-employees. Data on number of year-employees have been obtained from the employment statistics at Statistics Sweden. These statistics are not complete.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

VALIDATION OF DATA REGARDING TREATMENT OF WASTE

The compiled results have been quality controlled by independent experts.

STATISTICAL UNITS

It has been possible to divide up capacity data for the sector on a NUTS 02 level because the location of all facilities is known.

MOBILE WASTE TREATMENT

This does not occur within the Services sector (NACE G-Q excluding 51.57 and 90).

Appendix 8

Recycling (NACE 37) and Wholesale of waste and scrap (NACE 51.57)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

This appendix deals with waste generation in Recycling (NACE 37) and Wholesale of waste and scrap (NACE 51.57).

Appendix 8.1. Recycling (NACE 37) and Wholesale of waste and scrap (NACE 51.57) excluding car dismantling

1 Sources

Recycling (NACE 37) and Wholesale of waste and scrap (NACE 51.57) excl. car dismantling have been examined in a combined survey. When reviewing activities in NACE 37 and NACE 51.57 (excl. car dismantling) in the Business Register, we discovered that the classifications had in very similar activities in practice and that the classification could be in many cases seen as arbitrary.

Data were mostly collected from the environmental reports of the major facilities, though in some cases, supplementary data were obtained via interviews.

A list of facilities was extracted from EMIR. Environmental reports for these facilities were ordered from the county administrative boards, some could also be downloaded from SMP[46]. The list of facilities from EMIR was matched with the Statistics Sweden Business Register to identify and distinguish NACE 37 from NACE 51.57 and to identify car dismantlers in NACE 51.57. A list of identified car dismantlers that were classified as NACE 37 could be found from analyses for WStatR 2006. This was used to eliminate car dismantlers from NACE 37. For NACE 51.57, there is a special sub-group for facilities classified as wholesale of car wrecked where the car dismantlers should be classified.

In total, environmental reports from about 90 facilities in NACE 37 and NACE 51.57 were analysed.

[46] SMP : Swedish Portal for Environmental Reporting A portal for hazardous activity operators to send in their environmental reports electronically. Supervisory authorities, including the Swedish Environmental Protection Agency and its consultants (SMED) have access to SMP and can download environmental reports that are in the database. Use of SMP is as yet voluntary.

The environmental reports were studied in detail with regard to main activity and generation of waste (waste-type and quantity). They usually contained poor information about generated waste (environmental reports must contain "production data" but how these are to be reported is poorly specified). Most of the environmental report mentioned the fractions that were transported out of the facilities for recycling. Our interpretation of generated waste is, for these sectors, that new waste is deemed generated when the waste changes waste code via some form of treatment (e.g. sorting) or in principle when it significantly changes its physical-chemical characteristics.

Our interpretation is that the type of waste belonging to the main activity (e.g. metallic waste at metal recyclers) should not be seen as generated waste since it has been received from another activity and does not change waste code in the facility. Therefore, a sorting residue is instead calculated by multiplying specified values by a percentage calculated from background data compiled for WStatR 2006, see the table below.

Table B8.1.1 Factors used to calculate sorting residues.

Type of waste dealt with	Factor: Generated quantity of sorting residues (EWC-Stat 10.3) *tonnes of sorting residue per tonne waste dealt with*
06. Metallic wastes	0.0026
07.1 Glass wastes	0.13
07.2 Paper and cardboard wastes	0.005
07.3 Rubber wastes	0.05
07.4 Plastic wastes	0.17
07.5 Wood wastes	0.05

The descriptions found in the environmental reports concerning main activity were in the vast majority of cases so inadequate that it was not possible to determine which sector they belonged to, i.e. whether they belonged to NACE 37 or NACE 51.57.

Activities were not initially classified into NACE 37 and NACE 51.57 due to inadequate information about main activity in the environmental reports. Instead, activities were classified into local unit which, according to the environmental reports, either mainly traded in metal or did not trade in metal. One waste factor per waste-type was obtained by dividing generated quantities within each group (metallic and non-metallic) respectively by the number of employees in the group, according to data from the Business Register.

The calculation, in order to cover the entire sector, was performed in accordance with the following procedure. The projected waste factor was multiplied by the total number of employees, metallic and non-metallic actors taken together, in NACE 37 and 51.57. The data on the total number of employees in each segment respectively were obtained from the Business Register. By doing this, a certain quantity of waste per waste-type was obtained for metallic actors and non-metallic

actors in NACE 37 and a quantity of waste per waste-type for metallic actors and non-metallic actors in NACE 51.57.

Finally, metallic actors and non-metallic actors for each sector, NACE 37 and 51.57, were combined, resulting in a total amount for each respective waste-type within the sectors.

2 Accuracy

Accuracy depends mostly on the following:

- model assumption
- interpretation of data in the environmental reports
- errors in NACE coding in the Business Register
- Data in the Business Register on number of employees

2.1 SAMPLING ERRORS

Not relevant

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

2.2.1.1 Coverage errors regarding the population

To estimate the number of employees used to calculate waste factors, the statistical object applied was "local unit" since the Business Register is based on local unit. There is therefore a risk that several types of activities can occur at the same local unit. This problem would imply overestimation of the number of employees in the sectors in question.

This problem occurs, however, both when calculating waste factors per employee and when calculating the total quantities of waste. Since number of employees occurs on the one hand in the denominator and on the other in the numerator, these errors partially cancel each other out.

2.2.1.2 Coverage errors regarding waste quantities

In some cases, there has also been a problem with identifying which waste code is the most appropriate. For example, data may have been received that was specified as "miscellaneous waste or "other waste".

Our premise has been that only waste that significantly changes its physico-chemical characteristics, i.e. basically changes its waste code, is classified as generated waste. For local units that mainly sort waste, this means that if the waste comes in as paper or plastic and is then sorted at the facility, it should not be reported as generated waste. However, if waste is received as mixed waste and is sorted into plastic and paper, it does constitute generated waste.

In occasional cases, local units within NACE 51.57 can receive waste quantities from other local units within the same sector. As it is not possible to differenti-

ate between this waste using primary or secondary categorisation, waste quantities may be counted twice.

2.2.2 Measurement errors

Interpretation of quantities stated in environmental reports can affect their precision.

2.2.3 Processing errors

Quantities have been assumed to have been specified in tonnes. There is a risk that other units have been used without being specified.

In some cases, we have used our own standardised conversion factors to convert to tonnes when checking the data. Some of the conversion factors are not particularly controversial, such as tonne per m3 of oil, while others are more problematic, i.e. when the waste has been mixed or when we do not know how compressed the waste is.

All environmental reports have been processed in a systematic and consistent manner in order to minimise any processing errors.

Data from analysed environmental reports have been inputted into a database manually which can lead to coding errors.

2.2.4 Non response errors

Only data from about 90 environmental reports have been analysed.

It has not been possible to distinguish office paper waste from NACE 51.57 from the rest of the service sector. This type of waste has therefore been reported in the service sector.

2.2.5 Model assumptions errors

The model assumes that activities in sectors NACE 37 and NACE 51.57 are similar. We have employed the principle that it is the type of material being handled that most affects waste generation. We therefore chose to make a distinction between facilities that mainly handled metallic wastes and facilities metallic mainly handled other materials, and thereby calculate waste factors for both groups respectively. This model can obviously cause considerable uncertainty in the factors since many enterprises handle several different materials, both metallic and non-metallic.

The analysed environmental reports represent the largest actors in the sectors in question. Small local units are thereby not represented in the background data used to calculate waste factors.

We have not examined whether there is any significant difference in waste quantities in proportion to the number of employees at larger and smaller local units respectively. This causes considerable uncertainty in the results.

We have used model assumptions in the form of waste factors (0.1 ton/employee) for household waste generated. Since the number of employees at local units in the sectors NACE 37 and NACE 51.57 is generally relatively low and that the waste factors themselves can be assumed to be normally distributed, it can be assumed to be a good approximation to estimate quantities on the total level.

2.2.6 Other errors affecting accuracy

Not applicable for this sector

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

Not applicable for this sector since waste treatment that is to be reported under the waste statistics regulation does not occur.

Appendix 8.2. Car dismantling in NACE 51.57

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

In the previous survey, WStatR 2006, car dismantlers were classified in both NACE 37 and NACE 51.57, according to how they had been registered in the Statistics Sweden Business Register. This year, we decided to report all car dismantlers as NACE 51.57, where they really ought to be registered.

1 Sources

Many facilities within NACE 37 and NACE 51.571 which carry out car dismantling are members of the Swedish Car Recyclers Association (SBR). Every year, the SBR carries out a questionnaire survey among its members, producing data on the number of scrapping certificates issued and on the quantity of waste generated for a number of selected waste types. We have had access to SBR's questionnaire responses as regards the financial years 2003 to 2006. The total quantities cannot be used as a measurement of the total quantity of waste because not all car dismantling facilities are members of the SBR. The figures have instead been used to develop waste factors for each type of waste respectively.

For financial years 2005 and 2006, SBR's questionnaire has been performed electronically using a system provided by BOSAB in Berg. We have received the questionnaire data in Excel format. Here, there is not the same scope for checking that all quantities really have been specified in tonnes. Furthermore, in contrast to WStatR 2006, there were no data on the number of scrapping certificates issued. Instead, it was assumed that the number of chassis sent for fragmentation is equal to the number of scrapped units, which may be a source of error.

Processing of the questionnaire data began with the waste-types being converted to EWC-Stat codes by combining a number of variables (waste-types). The quantities of each waste-type were added together. Each waste factor was obtained by dividing the total quantities for each waste type by the number of scrapping certificates issued.

The Swedish Road Administration compiles data on the total number of scrapping certificates issued in Sweden each year. Using simple multiplication of the waste factors and the number of issued scrapping certificates from the Road Administra¬tion, it is possible to obtain estimates of total waste quantities in tonnes for each type of waste.

2 Accuracy

Since the basis for calculating waste factors consisted of four years of SBR's questionnaires (2003, 2004, 2005 and 2006), we believe we have developed accurate waste factors.

2.1 SAMPLING ERRORS

Not applicable for this sector.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

The SBR's questionnaire has been used as a basis for the waste factors. We consider the following as possible coverage errors for this questionnaire.

2.2.1.1 Coverage errors regarding the population

There is a risk that certain types of vehicle are not represented among the SBR's members, such as the dismantling of trucks and buses or works machinery.

2.2.1.2 Coverage errors regarding waste quantities

The number of scrapped cars does not always correspond with the number of scrapping certificates because a car dismantling facility may deal with cars that have been stored from previous years. Coverage errors regarding waste quantities can also be caused when not all scrapped cars have received a scrapping certificate. This refers to crashed cars, for example.

As certain types of dismantling facility are not represented in the SBR, there can have been an underestimation of waste quantities.

End-of-life vehicles may have been reported in other sectors, such as households, which may also lead to these being counted twice.

Data on the number of scrapping certificates issued were obtained from the Swedish Road Administration website. It has emerged that the number of scrapping certificates also includes certificates for motorcycles and other vehicles that actually don't need one. This results in some overestimation.

2.2.2 Measurement errors

The statistical unit for car dismantling is tonne of waste per scrapping certificate. The measurement error is primarily caused when the information in the SBR questionnaire is not given in the correct unit. There is a risk that the quantities given in

tonnes actually refer to kg and vice versa. As the method of developing waste factors per scrapping certificate is based on averages, some waste factors have serious errors. This is generally in cases where very few facilities state a particular type of waste.

2.2.3 Processing errors

Data from the SBR questionnaire was entered into an Excel database. In several cases, recalculations were required to convert the units given in the questionnaires (i.e. item, m³, container, kg, barrel) to tonnes. Standardised conversion factors developed by SMED were used in these cases. There can be mistakes in the calculation of certain types of waste, particularly when data include problematic units, such as barrel, container, oil filters and tyres with or without rims.

Waste categories in the SBR questionnaire were reported according to the list of waste and not according to EWC-Stat codes. In order to obtain EWC-Stat codes, it was necessary to combine several types of waste category and convert to EWC-Stat codes. This results in a risk for errors in coding, which we consider to be relatively small.

For the financial years 2005 and 2006, the number of scrapping certificates has been imputed based on the number of chassis sorted into metallic fragments, which contributes to processing errors.

2.2.4 Non response errors

The response rate for the questionnaire from SBR has varied from year to year but has never been 100%. This non-response can obviously have an effect on our results. It is however not possible to quantify this error.

2.2.5 Model assumption errors

Model errors can occur in the assumption that the number of scrapping certificates is proportional to the quantity of waste.

Some of the objects in the SBR sample may be extremes in some way. As the values for these objects are then multiplied by a factor of 10, the result can be a large over-evaluation of one type of waste. This error is not easy to detect unless it is so significant in various compilations that an experienced waste/industry expert can detect the "error". Even when this type of error is detected, it is not clear how it should be addressed.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

Waste treatment does not occur in this sector.

Appendix 9

Sewage and refuse disposal, sanitation and similar activities

Sector NACE 90 Sewage and refuse disposal, sanitation and similar activities is divided up into three different surveys

- sewage treatment
- waste treatment
- sanitation

Each of these surveys is described separately below.

Appendix 9.1. Collection and treatment of sewage (NACE 90.01)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

The source for waste generation in the sub-sector is Sweden's 2007 report in accordance with the Sludge Directive (86/278/EEC) with regard to 2004-2006[47].

2 Accuracy

The primary reasons for uncertainty regarding the quantity of dry matter are considered to be the lack of clarity in definitions (rotten or not, in addition to other process stages), and the risks of confusing wet and dry weights when registering data from environmental reports. Overall uncertainty about the quantity of dry matter is judged to be from □10% and for wet weight □25%. The wet weight is estimated to have larger uncertainty due to unceratnaty with the dry matter content.

2.1 SAMPLING ERRORS

Not applicable for this sector.

[47] SMED report: Underlying data for the 2007 report in accordance with the Sludge Directive 86/278/EEC, Annex 1, 15 October 2007.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

2.2.1.1 Coverage errors regarding the population

There are slightly over 400 sewage treatment facilities that are known to produce sludge. It is considered that these also treat sludge generated in smaller sewage facilities and sludge from private sewers. This assumption is partly supported in the results from a questionnaire survey carried out in 1999 on sewage treatment techniques for facilities designed for over 200 person equivalents. One of the questions on the treatment of sewage in the questionnaire referred specifically to how much sludge is sent to the sewage treatment facility[48].

2.2.1.2 Coverage errors regarding waste quantities

The method chosen should give 100% coverage of waste generated as well as recovery and disposal within the sector.

2.2.2 Measurement errors

The quantity of dry matter in the annual production of sludge can be both defined and estimated in different ways and according to different procedures. The calculation of quantity is based on different measurements/estimates of wet weights and dry matter content in one stage of production, most likely after anaerobic digestion. We are not clear on the details of this method.

2.2.3 Processing errors

Both wet weights and quantities of dry matter can be registered in EMIR. These parameters are sometimes confused. If an incorrect registration is not detected and corrected when the statistics are compiled, errors can occur to a factor of about 5, which together can lead to overestimations of the quantity of dry matter.

2.2.4 Non response errors

Compensation for non-response data on sludge quantities generated is only carried out for a small number of facilities. In these cases, the quantity is assumed to be the same as the quantity from the previous compilation of statistics. The resulting error is considered to be small compared to other types of error.

2.2.5 Model assumption errors

The following assumptions have been made:

1) The average dry matter content is assumed to be 22% when compiling facility data to national data. When reporting to WStatR, data on quantities of dry matter were used. A calculation of wet weight is made with factor four, which corresponds to a dry matter content of 25%.

[48] The presentation of results is included in the SMED report *Actual technical data for sewage treatment facilities*, 2003

2) It is assumed that the more than 400 sewage treatment facilities that are known to produce sludge also treat sludge generated in smaller sewage facilities and sludge from private sewers.

Here, the first assumption is a pure model. We believe that the second assumption is reasonable well met.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

Not applicable for the sector as no treatment of waste is thought to occur.

Appendix 9.2. Collection and treatment of other waste (NACE 90.02)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1. Sources

The data source for the sub-survey Collection and treatment of other waste (NACE 90.02) is a voluntary total population survey using paper questionnaires directed at waste treatment facilities such as landfill sites, composting facilities, digestion plants, incineration facilities for the disposal of waste as their primary purpose (see exceptions in Appendix 7, NACE G-Q) and sorting facilities for municipal waste.

Facilities that only constitute intermediate stores, recycling centres, sorting facilities for waste other than municipal waste and pre-treatment facilities were not included in the target population. Other facilities not covered include incineration facilities for energy production (see Appendix 5, Electricity, gas and water supply NACE E), treatment facilities linked to mining and manufacturing industries (see Appendix 4, Mining and Manufacturing industries NACE C and D), car dismantling (see Appendix 8, Recycling (NACE 37) and Wholesale of waste and scrap (NACE 51.57)) etc.

The frame has been put together using the Swedish Environmental Protection Agency's EMIR register, a fundamental and important source since it contains all activities that requires an environmental permit in Sweden[49]. Waste treatment facilities that are assumed to be active have been taken from this register. By using existing activity codes and information obtained when implementing questionnaire surveys regarding NACE 90.02 in WStatR 2006 for 2004, registers have been built up that have been used as a frame. It eventually contained a total 596 facilities

[49] See Ordinance 1998:899 on environmentally hazardous activities and protection of public health

which were deemed able to be active and relevant. Questionnaires were sent to all these. After receiving questionnaire responses or on the basis of other information, 181 facilities could be eliminated. Reasons included the fact that the facilities were **closed, inactive or not included in the target population in 2006**. After elimination, there were 415 facilities left.

A questionnaire survey was carried out in three stages: a first mailing plus two reminder mailings (in June and September/October 2007 respectively). The final mailing requested that facilities should respond regardless of whether they were operational or not. They were also given the possibility of sending in their environmental report instead if they did not have time to respond to the questionnaire.

Alternative data sources such as environmental reports via the Swedish Portal for Environmental Reporting (SMP), the Internet and questionnaire responses for 2004 have been used, either for statistics of for a basis for elimination. In several cases, facilities have been contacted by telephone and asked for supplementary data. The frame was also checked against waste facilities in other sectors, e.g. NACE 37, NACE 51.57 and NACE D to avoid a facility being included in several surveys.

2. Accuracy

Measurement errors and partial non-response are the types of error that have had the greatest effect on the statistical results.

2.1 SAMPLING ERRORS

Not applicable for this sub-survey which is a total population survey.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

2.2.1.1 Coverage errors regarding the population

The frame in the total population survey contains considerable overcoverage, something which has become apparent during the implementation of the questionnaire survey. This has been addressed by elimination of overcoverage objects or reallocating questionnaire responses to adjacent surveys. The remaining, if any, overcoverage is considered to be limited in the survey. Overcoverage in the non-response (possible refusal to respond, etc.) is difficult to judge. Such overcoverage does not have any significant effect on the statistics since the non-response is not compensated for apart from the imputing of existing data from WStatR 2006 regarding 2004.

Undercoverage is, for obvious reasons, harder to identify. It is theoretically possible for a few active facilities to have been missed in the original frame. Checks have been made to ensure landfill sites have not occurred in the Avfall

Sverige frame. Undercoverage in the non-response (possible refusal to respond, etc.) is more difficult to judge. We know that facilities refuse to contribute data despite the option of sending in environmental reports instead of responding to the questionnaire. The survey is voluntary after all. We estimate that only small facilities with small waste quantities have not responded.

2.2.1.2 Coverage errors regarding waste quantities

An overall assessment of the compiled statistics regarding "quantities treated" is that, on the whole, they cover waste quantities well. "Quantities generated" can be marred by underestimation, whereas treatment capacity data can contain overestimations, particularly with regards to landfill capacity. See further in section 2.2.2.

2.2.2 Measurement errors

The questionnaires used for data collection apply the concepts from EU waste legislation and the EU Regulation on Waste Statistics. It is expected that respondents should be able to recognise and understand these concepts. The questionnaires in the survey have been adapted to each sector to make it easier for respondents to understand what data are being requested. Help has been available on the questionnaires in the form of definitions of everyday waste concepts and waste codes. Despite this help and clarification, we see that respondents can easily miss filling in data or fill in the wrong data. We discovered this when comparing questionnaire responses to corresponding environmental reports, or when several questionnaires were received from individual respondents when reminders were sent out. Responses can clearly vary, which is an indication of measurement error. Given the choice, we used data from environmental reports before the questionnaire responses, since we believe the former to be more credible than the latter. It is very difficult to judge how large the measurement errors are in the survey. Studies of this type of error have yet to be performed for this sector.

The survey questionnaire has been tested in two ways:

- The Statistics Sweden measurement technology lab has gone through the questionnaires and covering letters and put forward proposals for improvements.
- The questionnaires and covering letters have been sent to the Board of Swedish Industry and Commerce for Better Regulation (NNR) and the Swedish Association of Local Authorities and Regions (SALAR) for comments.

Estimated values have been permitted in the survey. This should affect the precision of stated quantities.

Data on "Generation of waste" and "capacity" are considerably more uncertain than data on "treatment". "Generation of waste" is used naturally by the operators themselves and their internal waste flows are seldom weighed or measured.

Licensed capacities do not follow standardised wording on the permits which operators have received to conduct their activities. These data have been checked and adapted as thoroughly as possible.

"Preparation for recycling or recovery" (pre-treatment) is also often confused with "final recycling", as interpreted under the Mayer Parry judgment. Those checking the questionnaires have scrutinised such data especially carefully to avoid double counting of recovery. Only the final recovery has been noted as recovery in the statistics.

In the majority of cases, quantities are requested in tonnes. If respondents have used another unit, we requested in the questionnaire that this quantity unit should be converted into tonnes. If this has not been possible, we have requested that the other quantity unit be reported. When checking, we have then used our own standardised conversion factors to convert to tonnes. Some of the conversion factors are not particularly controversial, such as tonne per m3 of oil, while others are more problematic, i.e. when the waste has been mixed or when we do not know how compressed the waste is. See also section 2.2.5 below.

2.2.3 Processing errors

The comprehensive checking procedures have consisted of several stages at questionnaire level:

- estimation of rationality of the questionnaire responses
- comparisons with other data sources, i.e. environmental reports from facilities with permits where this has been possible and considered necessary
- control of data registration due to the risk of incorrect entries.

The comprehensive checking procedures have consisted of several stages at aggregated level:

- estimation of rationality on an aggregated level
- comparison with other data sources where alternative statistical sources have been found, e.g. statistics from Avfall Sverige.

These methods have sometimes led to some questionnaire data being changed.

When registering the submitted questionnaire responses in the working database, there has been some risk that data has been coded incorrectly. All such errors have in most cases not been possible to discover despite the inputted material having been scrutinised by those checking the questionnaires. Larger errors, such as errors in the magnitude have probably been detected in most cases when aggregations of various kinds have been carried out during a thorough analysis of the survey results. When studying aggregated data, a number of unreasonable data has appeared, which it has been possible to correct either in the questionnaires (checking misses) or in the database (input errors).

Coding errors relating to regions do not occur in this survey as the unique facility numbers used include a municipality code, which makes regional divisions of data possible and accurate.

2.2.4 Non response errors

Out of an original total of 596 facilities, 181 have been eliminated for one reason or another. 349 facilities contributed data on waste quantities and/or capacities. Final object non-response is made up, after elimination, of 596 - 181 - 349 = 66 treatment facilities. This corresponds to 11% of the facilities in the original frame. After elimination, non-response is equal to 16% of the total number of treatment facilities.

No general statistical adjustment has been done of the final non-response. This is because these facilities/enterprises can very likely constitute "overcoverage" of various types instead of "true" non-response. Another reason is that they do not seem to be representative for the population as a whole as they are generally small and divergent facilities. It is therefore assumed in the survey that no waste is generated or treated in this group, nor that these facilities have any treatment capacities. This assumption is probably not entirely correct, but is made in the absence of clear information about these facilities.

The effect of partial non-response is described in section 2.2.5 below.

2.2.5 Model assumption errors

The submitted questionnaire responses have been amended or supplemented after checking for various reasons such as partial non-response or conversion to requested weights/units. This has been normal for the generation of waste, e.g. for household waste and leachate, treatment capacities, etc. A number of conversion factors for imputation/correction have been developed for this purpose. Some of these conversion factors are calculated, some are documented data from published sources and some are "expert assessments", i.e. documented data from subject experts. These conversion factors can correspond to a greater or lesser extent to the reality for the individual facilities. On the whole, such imputations make the statistics considerably more accurate than they would be without these measures.

2.2.6 Other errors affecting accuracy

The questionnaire has been sent to the person responsible for environmental issues at the local units. It is possible that another person could be able to fill in the questionnaire more accurately or that non-response would be less if another person is addressed. In some specific examples, we have received two questionnaires from the same local unit with different data (normal and reminder), either from the same respondent or two different respondents.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

VALIDATION OF DATA REGARDING TREATMENT OF WASTE

Despite the high response rate and including imputing measures, we cannot determine for certain whether there are regional differences as regards coverage. This is due to the lack of clear information on the non-response.

STATISTICAL UNITS

The survey object has been treatment facilities. Every facility in the EMIR register has a unique facility number received when they are issued a permit. The four first digits in this number refer to a municipality code. Regional comparability is therefore good in this respect.

MOBILE WASTE TREATMENT

No mobile waste treatment facilities have been identified within the frame.

Appendix 9.3. Sanitation, etc. (NACE 90.03)

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

Reporting in accordance with WStatR 2006 on waste quantities in 2004 has been the data source used. These data were compiled by calling a sample of Sweden's municipalities and an extrapolation procedure based on number of municipality inhabitants.

For further information, see the Quality report for statistics on the generation of waste and recovery and disposal of waste in Sweden 2004[50]. The sources used are persons responsible for the sanitation of streets, parks and gardens within the different municipalities. We have collected the data by telephone.

[50] Swedish Environmental Protection Agency Report 5588 (Swedish version) and Swedish Environmental Protection Agency Report 5594 (English version)

2 Accuracy

2.1 SAMPLING ERRORS

See the Quality report for statistics on the generation of waste and recovery and disposal of waste in Sweden 2004. That survey was based on questionnaires to municipalities that cover about 15% of the country's inhabitants.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

2.2.1.1 Coverage errors regarding the population

See the Quality report for statistics on the generation of waste and recovery and disposal of waste in Sweden 2004. When planning, an assessment was made that the sector Sanitation etc. (NACE 90.03) would contribute relatively small quantities of waste, compared to NACE 90 as a whole. It was therefore decided to carry out a limited survey of NACE 90.03, in order to determine whether this sub-sector was of importance or not. The results showed that the sub-sector generated relatively small quantities of waste. The Swedish Association of Local Authorities and Regions has divided Sweden's 290 municipalities into 9 different categories. 32 municipalities representing all 9 categories were selected randomly. The sample in this survey consisted of at least 3 municipalities from each category and is representative for the entire population. We received usable responses from 15 municipalities covering roughly 14% of Sweden's population and representing 7 out of 9 municipality categories.

2.2.1.2 Coverage errors regarding waste quantities

See the Quality report for statistics on the generation of waste and recovery and disposal of waste in Sweden 2004. There we wrote that just about all the data are estimated by the respondent. Very few municipalities keep records on data of this kind. The estimates are, as far as we can see, reasonable but there is nothing to check the data against.

The data in the previous survey were extrapolated using population data as a basis (responses were received from municipalities with 1 261 918 inhabitants, the entire population of Sweden was 8 975 670). The standard deviation was of the size of 200 - 300% of the mean value. The standard deviation was least for the category "mineral waste" (grit swept after gritting treatments), where it was 119%.

2.2.2 Measurement errors

See the Quality report for statistics on the generation of waste and recovery and disposal of waste in Sweden 2004. There, it is stated that most of the collected data are estimates made by the person responsible at each municipality.

2.2.3 Processing errors

Not applicable for this sub-survey.

2.2.4 Non response errors

See the Quality report for statistics on the generation of waste and recovery and disposal of waste in Sweden 2004. There, it is stated that we successfully reached 22 out of 32 selected municipalities and obtained practicable results from 15. Of these, 9 submitted all the data we requested, 6 provided incomplete data, 4 did not get back to us as promised and 3 were not able to produce the data.

2.2.5 Model assumption errors

See the Quality report for statistics on the generation of waste and recovery and disposal of waste in Sweden 2004. There, it was stated that data is extrapolated to correspond to the total number of inhabitants in Sweden. This is not a completely correct model as it can be assumed that the quantity of waste from sanitation services is not only directly related to the number of inhabitants but also relates to other factors, such as the road network, existence of parks and green areas, etc. We still consider that the error is relatively small.

In our opinion, the error that occurs when 2004 figures are reused is negligible, since sub-sector 90.03 generates very small quantities. By reusing data, we have increased the uncertainty in the figures

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

Not applicable for NACE 90.03 as we assume that no such treatment occurs within sector.

Appendix 10

Households

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

Data on waste quantities have been collected and an assessment has been made on how much comes from households, using contacts with the following organisations:

- AB Svenska Returpack (an organisation responsible for recycling aluminium cans and PET bottles)
- Apoteket AB (the national cooperation of Swedish pharmacies)
- Avfall Sverige (Swedish Waste Management)
- Batteriinsamlingen (Battery collection)
- BIL Sweden (representing manufacturers and importers of cars, trucks and buses)
- El-Kretsen AB (service company within electrical and electronic trade associations with the task to practically fulfil the producer's responsibility for WEEE)
- FTI (Packaging and newsprint collection)
- IVL (Swedish Environmental Research Institute)
- Kretsloppskontoret Göteborg (Waste Management Office- Göteborg)
- Lantmännen Maskin AB (Agricultural machine importer, seller)
- Pressretur AB (an organisation responsible for recycling of paper within the producer's responsibility)
- SCB - Statistics Sweden, units for Environment and Tourism, Regional Planning and Natural Resource Statistics and Transport
- SDAB (Swedish Tyre Recycling Organisation) - an organisation responsible for the producer's responsibility for tyres)
- Svensk GlasÅtervinning AB (an organisation responsible for recycling of glass within the producer's responsibility)
- Brewers of Sweden
- Valla Däck AB (private tyre company, which has given information on consumption of tyres)
- Swedish Road Administration, Traffic Register (for information on end-of-life vehicles)

2 Accuracy

Under the Swedish producer responsibility, producers (via material companies) are responsible for reporting waste quantities to the Swedish Environmental Protection Agency. This means that total figures for the types of waste affected by producer responsibility are very accurate. When statistics on the share of waste generated from households are not available, an assessment has been made by experts in the subject. These assessments are therefore the best possible. The same is applicable for types of waste not included under the producer responsibility.

The source of error with the most effect on the results is most likely that waste generated by households in very few cases is collected/reported entirely separately from household waste from business activities.

2.1 SAMPLING ERRORS

Not applicable for households.

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage error

The majority of household waste is collected by municipality contractors directly at the property or is brought by the household to recycling stations (waste covered by producer's responsibility), recycling centres (bulky waste, garden waste, domestic building and construction waste and similar, environmental stations (hazardous waste) or other collection sites. The method used to give 100 % coverage is based on these waste flows. Exceptions include discarded vehicles and rubber waste, which is calculated from the number of scrapping certificates and the number of vehicles in traffic. For every waste type, an expert assessment has been given on how much of this comes from households and how much from shops, offices, etc.

2.2.1.1 Coverage errors regarding the population

Recycling stations and recycling centres are primarily for private individuals, i.e. households. In practice, however, some waste is included from small enterprises, for example. It is not possible to distinguish this quantity and it has therefore been assumed that all packaging waste (except glass packaging) and green waste brought to recycling stations and recycling centres comes from households. This also relates to pharmaceutical waste brought to pharmacies. There is thus a risk for overcoverage, i.e. that waste quantities generated in other sectors may be counted within the household sector. The industry experts consulted considered that counting all the above-mentioned waste in the household sector gives a better result than trying to estimate how large a share comes from shops, offices, etc. The assessments made on households' share of the different waste types are in most cases estimates from industry experts, which naturally results in risks for both over and undercoverage.

2.2.1.2 Coverage errors regarding waste quantities

Existing data on waste generated by households refer in most cases to treated waste. In order to be able to calculate the quantity of waste generated from households, it has been assumed that this is the same as treated waste. This leads to some under-reporting but this is not considered to have a significant effect on the total result.

The methods used for calculating households' generated waste involve some simplifications. For example, waste containing PCB is not thought to come from households. This is because it is difficult to obtain data on these types of waste and that it relates to small quantities of waste that are not considered to lead to any greater error in the final results.

Certain types of waste are generated by households but are not sorted into a specific fraction, such as textile waste and non-hazardous discarded equipment. These cannot be measured and are therefore included in the item household and similar wastes.

Hazardous waste is reported as a total figure from Avfall Sverige, with the exception of wood waste, discarded equipment and end-of-life vehicles. The total figure is, according to Avfall Sverige, of good quality but the divisions into different types of waste that we had access to were based on relatively few observations and therefore lead to some uncertainty in the quantities of the waste types included.

2.2.2 Measurement errors

Not applicable for households.

2.2.3 Processing errors

Not applicable for households.

2.2.4 Non response errors

Not applicable for households.

2.2.5 Model assumption errors

Rubber waste has been calculated by multiplying the number of privately-owned vehicles in traffic by the number of tyre changes per year and the weight of the tyres. For passenger cars, light trucks and light buses and tractors, these figures have been obtained from industry experts that have a sound basis for their assessments. For motorcycles, very rough estimations have been made for average weight and number of tyre changes per year and the figures can therefore differ somewhat from reality. As passenger cars are the clear dominant factor when considering rubber waste, errors in tyre weight and number of tyre changes for motorcycles only leads to a very small error in the total results.

The same applies for discarded vehicles, where the number of privately-owned scrapped vehicles has been multiplied by the vehicle's average weight. The average weight for motorcycles is uncertain but, because passenger cars are dominant for the total result, it is judged that motorcycle weight is of minor importance.

For the calculation of sludge quantities from individual sewers, it has been assumed in the model that one person gives rise to 175 g sludge (dry matter) per day. This is a model previously used by IVL (Swedish Environmental Research Institute). There is a risk that the model value differs from reality but the model is still considered to be the best available. A change in the model value has a relatively large effect on the final result which is why the quantity of sludge generated has been given a coefficient of variation of 20 % for dry weight and 40 % for wet weight, where even the assessment of dry matter affects uncertainty.

Asbestos waste (classified as mineral waste, hazardous waste) is collected from households in several municipalities. We have data from eleven municipalities in Sweden. The data were extrapolated to the national level based on the populations in the municipalities included. This is an uncertain extrapolation since the quantity of asbestos waste is not necessarily linked to population, but it was the best method based on available data.

2.2.6 Other errors affecting accuracy

One source of error for which it is difficult to estimate the significance is the quality of the data. The majority of data has been provided primarily by material companies and Avfall Sverige. The figures are considered to be of good quality but, because they have partly been provided using questionnaire surveys, they naturally contain non-response, measurement and processing errors. In order to calculate uncertainty of the total results for waste generated by households, an error margin of 5% has been added to all second-hand data.

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

Waste treatment is not applicable for households.

Appendix 11

Recovery and disposal of waste

The numbering of the sub-headings in this appendix refers to the corresponding sub-headings in Part II Quality attributes. We have here included those sections/sub-headings from Part II that are significant for the sub-survey in question. Otherwise, the information already described in Part II is applicable.

1 Sources

Data on recovery and disposal have been produced sector by sector within the surveys described in Appendices 2 – 10 (with the exception that waste treatment does not occur in all industries):

- Agriculture, hunting and forestry (NACE A). No waste treatment is thought to occur. We have not considered the use of fertiliser, sludge, compost and biofertiliser as recovery that should be reported, see Appendix 2.
- Fishing (NACE B). No waste treatment is thought to occur. We have not considered the throwing of fish gut residue overboard out at sea to be waste treatment (discharge to water), see Appendix 3.
- Mining and quarrying (NACE C) and Manufacturing (NACE D): Recovery and disposal have been studied in questionnaire surveys together with generated waste or by examining data in environmental reports or from various sector organisations, see Appendix 4. There are several different types of recovery and disposal operations occurring within NACE C and NACE D.
- Energy, gas and water supply (NACE E): Incineration of waste has been studied in a questionnaire survey to enterprises that produce energy by incineration, see Appendix 5. Waste treatment occurs mostly in the form of incineration with energy recovery (R1), and incineration of wood waste, animal and vegetal waste and municipal waste is significant. Other types of waste treatment occur only at a few facilities in the sector.
- Construction industry (NACE F). The only recovery occurring is the recovery of excavation materials.
- Service sector (NACE G-Q excluding 37 and 51.57): Some treatment facilities can be found in the service sector, including crematoria for small animals, treatment of animal carcasses and waste incineration at hospitals.
- Recycling (NACE 37): It is primarily pre-treatment that occurs. This should not be reported according to the waste statistics regulation.

- Wholesale trade in waste and scrap (NACE 51.57). Primarily intermediate storage and, occasionally, pre-treatment occur here. This should not be reported according to the waste statistics regulation.
- Sewage and refuse disposal, sanitation and similar activities. (NACE 90): Recycling and disposal within Refuse disposal (NACE 90.02) have been studied in questionnaire surveys together with generated waste, see Appendix 9.2. No treatment occurs in the sub-sectors Collection and treatment of sewage (90.01) and Sanitation and related activities (90.03).
- Waste generated by households: No waste treatment is considered to occur. Home composting has been regarded as internal recycling which should not be reported.

2 Accuracy

All member states shall report recovery and disposal allocated to NUTS 1 level according to the Waste Statistics Regulation. In accordance with a decision by the Commission[51] a new NUTS classification applies from 2008, dividing Sweden into three NUTS 1 regions. Previously, the whole of Sweden was one NUTS 1 region. An amended NUTS classification affects the design of surveys on recovery and disposal of waste since recovery and disposal quantities should be reported on the NUTS 1 level. The classification on the NUTS level remains the same. In this survey we have followed the older classification, thus reporting recovery and disposal for all Sweden only, and not for the three NUTS1 regions.

The source of error that affects the results to the greatest extent can probably be linked to non-response and sampling, primarily in the sub-survey relating to the manufacturing industry (NACE D), where several large important local units have not submitted data despite great efforts with reminders. Within NACE D, waste treatment is also extrapolated from the sample surveys. In the survey in NACE 90, we have managed to include all known facilities that treat large quantities of waste. Mostly smaller facilities that are adjudged to handle smaller quantities of waste are included in the non-response in NACE 90.

2.1 SAMPLING ERRORS

For the manufacturing industry (within NACE D), waste treatment has been adjusted upwards with sampling and non-response extrapolations. Total population surveys have been performed in other sectors.

[51] COMMISSION REGULATIONS (EC) No 105/2007 of 1 February 2007 amending the annexes to Regulation (EC) No 1059/2003 of the European Parliament and the Council on the establishment of a common classification of territorial units for statistics (NUTS)

2.2 NON-SAMPLING ERRORS

2.2.1 Coverage errors – waste definition and definitions of recycling and recovery

2.2.1.1 Coverage errors due to misinterpretation of waste and of recycling

Coverage errors can be due to misinterpretation of the definitions of waste and of recycling.

The definition of waste used by the EU has been the subject of several discussions, and has also been involved in several cases at the European Court of Justice. In this survey, we have interpreted the definition of waste widely as it has been interpreted by the European Court of Justice in several cases. At the same time, we have learnt in the surveys that, in practice, respondents do not understand the definition in the same way as the authorities. Drawing a line between by-product and waste is difficult, particularly when the waste/by-product is recycled. This definition is not even completely clear legally in the European Court of Justice.

The concept of recycling and recovery

The ECJ case Mayer Parry (C-444/00) states that waste ceases to be waste only when it becomes a new product. We have interpreted this so that recovery is the process when waste becomes a new product. Previously the general interpretation has been that waste ceases to be waste when it can be used as a raw material in a manufacturing process. When looking at recyclable paper, for example, waste paper can be considered waste until it has become new pulp or new paper at a pulp/paper factory. This means that pre-treatments, sorting, etc. do not constitute recovery that shall be reported according to Annex II in Waste Statistics Regulation. Sorting and such like occurs under NACE 37 Recycling. However, one consequence of the Mayer Parry case is that recycling does in practice not occur in NACE 37 (which is called "Recycling") but, instead, most usually within the manufacturing industry (NACE D).

When reporting on recycling, we have not taken into account pre-treatment and sorting but only the "final" recycling process when the waste becomes a new product or is included in a construction at a facility. The concepts of recycling and recovery also include the production of soil improvement fertilisers from composting or anaerobic digestion.

This interpretation ensures that data are not reported twice, as one particular waste flow is only reported once during the reporting.

2.2.1.2 Coverage errors regarding the population

Coverage errors regarding the population have been discussed for each survey in Appendices 2 – 10. For land filling, biological treatment and incineration, we have used different registers and sector organisations to obtain almost total coverage:

- EMIR, county administrative board databases of hazardous operations
- National Tax Board's list of taxable landfill sites
- Statistics Sweden energy statistics for incineration facilities

- Avfall Sverige which has a list of facilities that treat household waste, including waste incineration facilities.
- Our questionnaire surveys in NACE D have used local units in the Business Register as a basis Respondents have then themselves specified whether waste treatment occurs or not. In two of the sectors where a substantial amount of waste treatment occurs, NACE DE Pulp and paper industry and NACE DJ Metalworks, we have used data from sector organisations as a basis. In NACE D, we have also made comparisons with those who stated that they had waste treatment in WStatR 2006.
- For mines in NACE C, we have used as a basis a list of enterprises compiled by the Swedish Environmental Protection Agency and for whom we obtained data via environmental reports.

These facilities have been studied using questionnaire surveys and environmental reports.

For recycling in the manufacturing industry, the registers available are of a poorer quality, partly because recycling is only a secondary activity and the facility is hence not registered as a waste treater, and partly because many facilities don't consider the use of secondary raw materials as waste treatment. In many sectors, the relevant sector organisations collect data on recycling (use of secondary raw materials). For types of waste covered by the producer responsibility (paper packaging, plastic packaging, metal packaging, glass packaging, wastepaper, tyres, and electrical scrap) there are accountable "material companies" who collect statistics on the quantities of each material collected and recycled. For recycling in the manufacturing industry, we have mostly used data from sector organisations and material companies, e.g. for wood wastes, metallic wastes, paper and cardboard wastes, plastic wastes and rubber wastes. For materials and types of waste that are not included in this way, we have used data from questionnaire surveys.

2.2.1.3 Coverage errors regarding waste quantities

The methods used aim to give 100% coverage of the recovered and disposed waste, including capacity data. We have no reason to suspect that there is greater over or undercoverage than that described in the various errors in Appendices 2 - 10.

The reporting of recovery and disposal of waste covers facilities which require a permit or registration according to articles 9, 10 or 11 in the framework directive on waste (Directive 75/442/EEC). In practice, not all recycling comes under this rule:

- Secondary raw materials are classified as waste according to the Mayer Parry judgment by the European Court of Justice (C 444/00) but, before this judgment, were often considered as a commodity and not waste. This means that it has been difficult to make an inventory of all recovery and recycling, as industrial facilities that use secondary raw materials do not normally have a permit nor are registered according to Directive 75/44/EEC. A permit for hazardous operations

in accordance with the Swedish Environmental Code is not normally needed. Furthermore, they do not consider themselves that they are managing waste and, in the questionnaires, have often not stated that they recycle waste. This applies to waste such as wood wastes, metallic wastes, mineral wastes, etc.

- Mineral wastes, certain combustion wastes, treated contaminated soil, etc are widely used as construction materials in building and civil engineering projects in society. Much of this usage is difficult to survey.
- Other types of waste treatment that have not been covered in the surveys. For example, we have identified the following cases where the inventories are incomplete:
  - Water-containing wastes released in sewers are not always reported as waste. These wastes are often considered to be different types of sewage and not waste.
  - Use of sludge within the agricultural sector has not been reported as a treatment method.
- The difficulty in defining capacity measures for many types of waste treatment has led to the capacity often being estimated as being "in balance" with treated quantities.

2.2.2 Measurement errors

Common problems we have come across in the majority of surveys when collecting data have been the following:

1) Coding of certain hazardous waste has been unclear and confused, e.g. the difference between Spent solvents (EWC-Stat 01.1), Chemical preparation wastes (EWC-Stat 02) and Chemical deposits and residues (EWC-Stat 03.1);

2) Waste that contains oil can be classified with different codes according to EWC-Stat;
3) There has often been confusion between the three EWC-Stat codes Household and similar waste (10.1), Mixed and undifferentiated materials (10.2) and, occasionally, Sorting residues (10.3); at many municipal facilities where waste is sorted or separated, it is difficult to determine whether it is 10.2 or 10.3 that occurs.
4) Sludge has occasionally been incorrectly classified: Industrial effluent sludges (EWC-Stat 03.2) should be coded as Common sludges (EWC-Stat 11) or vice versa;
5) A large number noted the existence of Hazardous metallic wastes (EWC-Stat 06). The majority of these have actually been other types of waste, i.e. non-hazardous metallic wastes (06) or hazardous chemical preparation wastes (02), such as metal packaging contaminated with oil;

Quantities have been requested in tonnes in the questionnaires. It is however relatively common that respondents have submitted other quantity units. If other weight units (i.e. kg or 1 000 tonnes) have been reported, we have converted these

to tonnes. If other units have been reported (such as item, m^3 or barrel), we have used conversion tables where these are available. Avfall Sverige was among those sector organisations that developed such a table[52]. In certain cases, conversion factors have been acquired from experts. Some of the conversion factors are not particularly controversial, such as tonne per m^3 of oil, while problems have occurred when the waste has been mixed, for example, or when we do not know whether the waste has been compressed.

2.2.3 Processing errors

Processing errors have been described for the different sub-surveys in Appendices 2 – 10.

Common errors that can occur include:

- respondents misunderstand what data should be submitted (incorrect coding of waste treatments or types of waste)
- incorrect coding of data when checking
- input errors
- adjustment errors (because the adjustment models are not appropriate)

We have tried to detect these errors by regularly checking by the project group. Furthermore, independent experts have scrutinised and assessed the rationality of the results.

2.2.4 Non response errors

Non-response has been discussed for every sub-survey in Appendices 2 – 10. Non-response is considered to occur principally within sectors in the Manufacturing industry (NACE D). We estimate that waste treatment in the other surveys has had almost 100% coverage in the responses.

2.2.5 Model assumption errors

Errors in model assumptions are described for every sub-survey in Appendices 2 - 10. We estimate that errors for recovery and disposal are relatively small. The extrapolation model used within the Manufacturing industry (NACE D) can possibly lead to some uncertainty, see Appendix 4.

[52] Waste facilities with landfilling, Statistics 2003. Report from the Association of Waste Management 2004:13

5 Comparability

5.2 REGIONAL COMPARABILITY OF WASTE TREATMENT

VALIDATION OF DATA REGARDING TREATMENT OF WASTE

Data on waste treatment facilities have in many cases been checked against other administrative data (EMIR register of facilities licensed to conduct hazardous operations) or other available data. The compiled results have also been quality controlled and validated by independent experts.

STATISTICAL UNITS

Different statistical units have been used for the different sub-surveys: local unit, facility, enterprise, and sector. See further for every sub-survey in Appendices 2 – 10.

MOBILE WASTE TREATMENT

For the generation of waste and the recovery and disposal of waste, mobile equipment has been reported in the place where it has been used. Capacity data have, however, been reported in the home town. We have only found very few mobile operations in the survey, so the location of the facility is not considered to have any determining significance on the total reported quantities of waste or treatment capacities.

Appendix 12

Uncertainty estimates of key aggregates

1 Uncertainty in the questionnaire surveys

In cases where data on the generation of waste and on the recovery and disposal of waste have been produced from questionnaire surveys, statistical uncertainty (coefficients of variation) is created when extrapolations are carried out. This concerns surveys of waste in industry (NACE C and D). The variance is calculated according to the formula:

$$\hat{V}(\hat{t}_z) = \sum_{h=1}^{H} \frac{N_h^2}{m_h}\left(1-\frac{m_h}{N_h}\right)\frac{1}{m_h-1}\left[\sum_{k=1}^{m_h} z_{hk}^2 - \frac{\left(\sum_{k=1}^{m_h} z_{hk}\right)^2}{m_h}\right]$$

where,

$\hat{t}$ = *point estimate*
H = *number of strata*
N_h = *population in stratum h*
m_h = *total responses in stratum h*
r_h = *number of elements in stratum h*
y_k = *k-te variable value in stratum h*

The estimate's mean error is then calculated using $SE(\hat{t}) = \sqrt{\hat{V}(\hat{t})}$

after which the relative mean error or coefficient of variation are calculated using $rmf = \frac{SE(\hat{t})}{\hat{t}}$

The variance coefficients have then been given in per cent.

2 Uncertainty in other sources

In cases where sources other than questionnaire surveys with sampling form the basis of the inventory, uncertainty estimates are based on subjective assessments. We have made an uncertainty assessment for every figure produced, by assessing within which interval the true value lies with 95% probability. In sample questionnaire surveys, where the standard deviation and variation coefficient can be calculated, the true value is assumed, with 95% probability, to lie at the most 2 standard deviations over or under the statistical value that has been estimated. When we set up an equivalent uncertainty interval using other survey methods, we obtain a fictive standard deviation so that we can calculate a fictive variation coefficient that can be compared to the variation coefficient developed from the sample questionnaire survey.

We have used the following grounds for assessment when assessing uncertainty.

When assessing uncertainty, the uncertainties for **total hazardous waste and total non-hazardous waste** should in principle be considered as independent of the individual types of waste. Individual types of waste can often give major uncertainties in questionnaire surveys, due to uncertainties in classification, whilst their combined total is more certain.

For sectors where we haven't covered everything (e.g. NACE A and B, and Services (NACE G-Q, excluding 51.57 and 90), uncertainty is put on what has been developed and then the undercoverage is described under the relevant heading in the Quality report.

This is the same when a sector organisation does not request a certain type of waste (Jernkontoret did not request data on generated metallic wastes since they are considered to be scrap and not waste). In these cases, we have put uncertainty figures on the figures we have developed and mentioned and discussed the undercoverage in the quality report.

Distorted distributions can be approached in two ways; an assessment must be made for each individual case:

- Adjust the point estimate so that it lies between the most likely highest and lowest value respectively. This is mainly done if the interval is credible but the actual estimate is more uncertain.
- Adjust the uncertainty interval. For example, if the uncertainty is deemed to be -20% to +50%, □35% is specified. This is done if we wish to keep our point estimate.

The uncertainty for the entire sector or a group of waste-types can be lower than the uncertainty per waste-type since the quantity can be certain but uncertainties in the classification mean that individual waste-types can be uncertain.

Model for 95% confidence interval for qualified, substantiated export assessment:

- ±30% equivalent to the variation coefficient 15% in more complicated cases (heterogeneous sectors with many types of waste, e.g. Construction)
- ±20% equivalent to the variation coefficient 10% in simpler cases (homogenous sectors with few or straightforward types of waste)

Kretsloppsregister: Last time we considered the Kretsloppsregister to be a reliable source. This year, having seen some peculiarities in e.g. the construction sector, we have changed our assessment. For Kretsloppsregister data, we have this year set the confidence interval ±40%, i.e. variation coefficient ±20%.

Model for 95% confidence interval for **figures reused from last time**: It is reasonable to assume that the waste quantity can change by 2% per year. That will be 4%

in 2 years, in other words the confidence interval increases by 4% on two years, i.e. the variation coefficient increases by 2% in two years.

Model for 95% confidence interval for **figures projected from last time**: Here, the odd factor is used for the projection itself which should reflect the change in the sector. If it is reasonable to assume that the projection factor really does reflect waste generation, the same variation coefficient as last time can be used. If it is uncertain how certain the projection factor is, or if data is projected for more than two years, the confidence interval should be increased by 1-2% for each two-year period.

Model for 95% confidence interval for i**ndustry expert guesswork**: ±50-60% equivalent variation coefficient 25-30%.

Model for 95% confidence interval for **"expert guesswork"**:
±100% equivalent variation coefficient 50%.

Waste factors: When the factor is actually developed for other purposes (e.g. for waste planning or just to exemplify magnitudes), difficulties arise (e.g. in NACE B Fishing, the data from a relatively small number of Faroese boats in the 1990s is used and one wonders how reliable these are for use in Sweden today). If no other information is forthcoming, the uncertainty for a waste factor should be confidence interval = □50% to 100% equivalent variation coefficient 25% - 50%. The value can be greater or less depending on what other information is forthcoming.

Waste factors for household waste (100 kg/worker): confidence interval □ 20%, variation coefficient 10%.

Waste factor for office paper waste: the quantity data are reasonable reliable, but the number of office workers is less certain. A confidence interval of □50% was assumed, equivalent variation coefficient 25%.

Waste factor for biological waste from shops, restaurants, institutional kitchens (in NACE G-Q). We have used waste factors from Avfall Sverige. Similarly, we set the confidence interval = □50%, equivalent variation coefficient 25%.

Questionnaire surveys - sampling: When data is extracted from the working database and extrapolated for sampling (extrapolation is also carried out for non-response but that's another story), a variation coefficient is also obtained. Last time, this variation coefficient was used as it was. This year, we have considered the uncertainty as a preliminary gross uncertainty that can be adapted by the sub-project. For example, this may be needed where the background data are made up of environmental reports, the Mayer Perry case, data from last time, etc.

Questionnaire surveys – total population:
An ideal questionnaire survey with a 100% response rate will give a variation coefficient = 0. In addition, there may be processing errors, incorrect classifications, incorrect responses, incorrect inputting of data, etc., which mean that the values in the database are associated with some uncertainty. Likely errors must be assessed from case to case. Neither is the response rate in a real survey equal to 100%, without any non-response. We make uncertainty assessments on the figures we produce; the non-response is dealt with in the quality report.

Environmental reports as a data source: The content of an environmental report should in most cases be assumed to be true. We know that incorrect and contradictory data can occur, but they can in general be considered reliable. A processing error does occur, however, when we convert the content to WStatR format, e.g. convert types of waste to EWC-Stat or interpret different waste treatment methods. This applies in particular when waste codes are not stated or when treatment is poorly specified. Likely errors must be assessed from case to case. It can be reasonable to assume that the uncertainty (confidence interval) is □10 % for environmental report compilations.

Surveys from sector organisations (Swedish Forest Industries Association, Jernkontoret, Swedish Maritime Administration, etc.) The sector organisations have contributed in different ways

- In NACE C + D, we have obtained data from the Swedish Forest Industries Association and Jernkontoret on individual mills/works, and they have been considered as questionnaire responses in the survey, see above.
- In NACE G-Q, the Swedish Maritime Administration did its own questionnaire survey to Swedish ports and we received the results in one cluster. They should then be more compared to a qualified expert assessment and afforded a little more uncertainty (e.g. □ 20% confidence interval).
- The sector organisations' survey request data on different wastes that are common in each sector respectively and they use their own terminology, i.e. in accordance neither with the list of waste in the waste regulation nor with EWC-Stat. Some of the sector organisations have therefore used terminology which is not unequivocally compatible with EWC-Stat. This leads to classification error for the types of waste in question, which should in such cases be added to the previous uncertainty for the waste-types, but not for the total amount.

3 List of uncertainties in key aggregates

It has been assumed that the different sub-sectors are independent of one another when they are summed to the key aggregates (Table II.1). The standard formula for propagation errors can thus been applied:

$$U_{total} = \frac{\sqrt{(U_1 * x_1)^2 + (U_2 * x_2)^2 + ... + (U_n * x_n)^2}}{x_1 + x_2 + ... + x_n}$$

Where:
Utotal is the percentage uncertainty for the total waste quantity
xi is the incoming waste quantity
Ui is the percentage uncertainty for waste quantity xi

Appendix 13

Result tables

Uppkommen mängd avfall per sektor och totalt 2006

NACE A Jordbruk, jakt och skogsbruk				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.3	Oljeavfall	2,8	E
	02.	Avfall av kemiska beredningar	0,4	E
	03.1	Kemiska rester och avlagringar	0,1	F
	08.	Kasserad utrustning	0,2	E
	08.1	Uttjänta fordon	13,0	F
	08.41	Batterier och ackumulatorer	1,0	F
Totalt farligt avfall		**Total mängd farligt avfall**	**17,5**	**E**
Icke-farligt avfall	06.	Metallavfall	58,6	D
	07.2	Pappers- och pappavfall	2,5	E
	07.3	Gummiavfall	6,8	F
	07.4	Plastavfall	17,9	E
	08.	Kasserad utrustning	0,8	F
	08.41	Batterier och ackumulatorer	0,0	F
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	3 122,0	E
	09.3	Animalisk faeces, animalisk urin och gödsel	73,7	C
	10.1	Hushållsavfall och liknande avfall	3,9	D
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**3 286,2**	**D**
Totalt avfall		**Total mängd avfall**	**3 303,7**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE B Fiske				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.3	Oljeavfall	0,5	G
	03.1	Kemiska rester och avlagringar	0,2	G
	08.1	Uttjänta fordon	1,0	E
	08.41	Batterier och ackumulatorer	0,0	G
Totalt farligt avfall		**Total mängd farligt avfall**	**1,8**	**F**
Icke-farligt avfall	06.	Metallavfall	0,1	G
	07.1	Glasavfall	0,0	G
	07.2	Pappers- och pappavfall	0,1	G
	07.3	Gummiavfall	0,0	G
	07.4	Plastavfall	0,0	G
	08.	Kasserad utrustning	0,0	G
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	1,1	E
	10.1	Hushållsavfall och liknande avfall	0,3	G
	10.2	Blandade och ej differentierade material	0,4	G
	11.	Vanligt slam (exkl. 11.3)	27,3	G
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*6,8*	*G*
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**29,4**	**F**
Totalt avfall		**Total mängd avfall**	**31,1**	**F**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE C Utvinning av mineral				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,0	F
	01.2	Surt, alkaliskt eller salthaltigt avfall	..	..
	01.3	Oljeavfall	2,2	E
	01.4	Förbrukade kemiska katalysatorer	0,0	G
	02.	Avfall av kemiska beredningar	0,1	C
	03.1	Kemiska rester och avlagringar	1,0	F
	03.2	Avloppsslam från industrier	0,1	F
	03.2	*Avloppsslam från industrier, torrvikt*	*0,0*	*F*
	07.5	Träavfall	1,0	G
	08.	Kasserad utrustning	0,1	E
	08.41	Batterier och ackumulatorer	0,0	E
	10.2	Blandade och ej differentierade material	0,1	G
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,0	G
	12.4	Avfall från förbränning	..	..
	12.6	Förorenade jord- och muddermassor	0,0	G
Totalt farligt avfall		**Total mängd farligt avfall**	**4,8**	**F**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,0	A
	03.2	Avloppsslam från industrier	..	..
	03.2	*Avloppsslam från industrier, torrvikt*	..	..
	06.	Metallavfall	20,4	F
	07.1	Glasavfall	0,0	F
	07.2	Pappers- och pappavfall	0,2	E
	07.3	Gummiavfall	0,2	F
	07.4	Plastavfall	0,3	G
	07.5	Träavfall	1,1	F
	08.	Kasserad utrustning	0,1	D
	08.1	Uttjänta fordon	..	..
	08.41	Batterier och ackumulatorer	0,0	F
	10.1	Hushållsavfall och liknande avfall	0,9	F
	10.2	Blandade och ej differentierade material	4,2	D
	11.	Vanligt slam (exkl. 11.3)	5,7	G
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*1,6*	*G*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	62 031,0	A
	12.4	Avfall från förbränning	..	..
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**62 114,2**	**E**
Totalt avfall		**Total mängd avfall**	**62 119,0**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DA Livsmedels-, dryckesvaru och tobaksvaruframställning				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,0	E
	01.2	Surt, alkaliskt eller salthaltigt avfall	0,0	E
	01.3	Oljeavfall	0,4	D
	01.4	Förbrukade kemiska katalysatorer	..	..
	02.	Avfall av kemiska beredningar	0,0	E
	03.1	Kemiska rester och avlagringar	0,3	E
	03.2	Avloppsslam från industrier	0,2	F
	03.2	*Avloppsslam från industrier, torrvikt*	*0,0*	*E*
	05.	Sjukvårdsavfall och biologiskt avfall	..	..
	07.1	Glasavfall	..	..
	07.7	Avfall innehållande PCB	0,0	F
	08.	Kasserad utrustning	0,1	E
	08.41	Batterier och ackumulatorer	0,1	E
	10.2	Blandade och ej differentierade material	..	..
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,0	F
	12.4	Avfall från förbränning	0,0	F
	12.6	Förorenade jord- och muddermassor	1,0	F
Totalt farligt avfall		**Total mängd farligt avfall**	**2,3**	**D**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	..	..
	03.1	Kemiska rester och avlagringar	..	..
	03.2	Avloppsslam från industrier	272,8	E
	03.2	*Avloppsslam från industrier, torrvikt*	*62,3*	*F*
	05.	Sjukvårdsavfall och biologiskt avfall	..	..
	06.	Metallavfall	6,6	D
	07.1	Glasavfall	6,3	E
	07.2	Pappers- och pappavfall	20,5	D
	07.3	Gummiavfall	0,0	F
	07.4	Plastavfall	8,8	F
	07.5	Träavfall	6,7	F
	08.	Kasserad utrustning	0,2	E
	08.1	Uttjänta fordon	..	..
	08.41	Batterier och ackumulatorer	0,0	F
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	456,3	E
	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	145,0	E
	09.3	Animalisk faeces, animalisk urin och gödsel	12,9	E
	10.1	Hushållsavfall och liknande avfall	12,6	E
	10.2	Blandade och ej differentierade material	40,6	D
	11.	Vanligt slam (exkl. 11.3)	107,8	E
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*17,3*	*E*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	188,8	F
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**1 287,7**	**D**
Totalt avfall		**Total mängd avfall**	**1 290,0**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DB+DC Textil- och beklädnadsvarutillverkning samt tillverkning av läder och lädervaror				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.3	Oljeavfall	0,2	G
	02.	Avfall av kemiska beredningar	0,0	G
	03.1	Kemiska rester och avlagringar	0,0	G
Totalt farligt avfall		**Total mängd farligt avfall**	**0,2**	**F**
Icke-farligt avfall	03.2	Avloppsslam från industrier	1,0	G
	03.2	*Avloppsslam från industrier, torrvikt*	*0,3*	*G*
	06.	Metallavfall	0,4	G
	07.2	Pappers- och pappavfall	0,5	G
	07.5	Träavfall	0,1	G
	07.6	Textilavfall	19,0	G
	10.1	Hushållsavfall och liknande avfall	2,0	G
	10.2	Blandade och ej differentierade material	9,0	G
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**32,0**	**F**
Totalt avfall		**Total mängd avfall**	**32,2**	**F**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DD Trävarutillverkning				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,3	F
	01.2	Surt, alkaliskt eller salthaltigt avfall	0,0	F
	01.3	Oljeavfall	1,1	E
	01.4	Förbrukade kemiska katalysatorer	..	..
	02.	Avfall av kemiska beredningar	0,5	F
	03.1	Kemiska rester och avlagringar	0,8	F
	03.2	Avloppsslam från industrier	0,0	F
	03.2	*Avloppsslam från industrier, torrvikt*	*0,0*	*F*
	07.5	Träavfall	0,0	G
	07.7	Avfall innehållande PCB	0,0	G
	08.	Kasserad utrustning	0,1	E
	08.1	Uttjänta fordon	..	..
	08.41	Batterier och ackumulatorer	0,1	E
	10.2	Blandade och ej differentierade material	0,3	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,1	G
	12.4	Avfall från förbränning	1,6	G
Totalt farligt avfall		**Total mängd farligt avfall**	**4,8**	**E**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	..	..
	02.	Avfall av kemiska beredningar	10,7	G
	03.1	Kemiska rester och avlagringar	..	..
	03.2	Avloppsslam från industrier	0,1	F
	03.2	*Avloppsslam från industrier, torrvikt*	*0,0*	*F*
	06.	Metallavfall	8,3	E
	07.1	Glasavfall	2,7	F
	07.2	Pappers- och pappavfall	1,5	E
	07.3	Gummiavfall	0,1	F
	07.4	Plastavfall	2,0	E
	07.5	Träavfall	17 780,1	D
	08.	Kasserad utrustning	0,1	F
	08.41	Batterier och ackumulatorer	0,0	G
	10.1	Hushållsavfall och liknande avfall	3,0	E
	10.2	Blandade och ej differentierade material	10,3	D
	11.	Vanligt slam (exkl. 11.3)	0,7	G
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*0,2*	*G*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,5	F
	12.4	Avfall från förbränning	31,6	F
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**17 851,8**	**E**
Totalt avfall		**Total mängd avfall**	**17 856,6**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DE Massa-, pappers- och pappersvarutillverkning; förlagsverksamhet och grafisk produktion				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	..	..
	01.2	Surt, alkaliskt eller salthaltigt avfall	0,8	E
	01.3	Oljeavfall	4,5	C
	01.4	Förbrukade kemiska katalysatorer	0,0	G
	02.	Avfall av kemiska beredningar	1,3	E
	03.1	Kemiska rester och avlagringar	2,0	C
	03.2	Avloppsslam från industrier	..	..
	03.2	*Avloppsslam från industrier, torrvikt*	..	..
	06.	Metallavfall	0,0	E
	07.1	Glasavfall	0,0	E
	07.5	Träavfall	..	..
	08.	Kasserad utrustning	3,2	E
	08.1	Uttjänta fordon	..	..
	08.41	Batterier och ackumulatorer	0,1	E
	10.2	Blandade och ej differentierade material	0,4	E
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,0	B
	12.4	Avfall från förbränning	..	..
Totalt farligt avfall		**Total mängd farligt avfall**	**13,9**	**D**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	172,2	C
	02.	Avfall av kemiska beredningar	0,8	E
	03.1	Kemiska rester och avlagringar	255,1	C
	03.2	Avloppsslam från industrier	313,6	C
	03.2	*Avloppsslam från industrier, torrvikt*	*185,3*	*B*
	06.	Metallavfall	97,2	G
	07.1	Glasavfall	0,1	G
	07.2	Pappers- och pappavfall	1 518,9	C
	07.3	Gummiavfall	0,2	G
	07.4	Plastavfall	57,5	G
	07.5	Träavfall	4 101,8	C
	07.6	Textilavfall	..	..
	08.	Kasserad utrustning	1,8	G
	08.41	Batterier och ackumulatorer	0,0	F
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,0	E
	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	..	..
	10.1	Hushållsavfall och liknande avfall	4,5	E
	10.2	Blandade och ej differentierade material	25,4	E
	10.3	Sorteringsrester	92,1	E
	11.	Vanligt slam (exkl. 11.3)	902,1	E
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*127,9*	*E*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	..	..
	12.4	Avfall från förbränning	319,3	B
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**7 862,7**	**D**
Totalt avfall		**Total mängd avfall**	**7 876,7**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DF Tillverkning av stenkolsprodukter, raffinerade petroleumprodukter och kärnbränsle				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,1	F
	01.2	Surt, alkaliskt eller salthaltigt avfall	..	..
	01.3	Oljeavfall	1,3	C
	01.4	Förbrukade kemiska katalysatorer	..	..
	02.	Avfall av kemiska beredningar	0,1	E
	03.1	Kemiska rester och avlagringar	20,8	E
	03.2	Avloppsslam från industrier	1,1	E
	03.2	*Avloppsslam från industrier, torrvikt*	*0,3*	*E*
	05.	Sjukvårdsavfall och biologiskt avfall	0,0	A
	08.	Kasserad utrustning	0,0	E
	08.41	Batterier och ackumulatorer	0,0	E
	10.2	Blandade och ej differentierade material	0,0	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,0	F
	12.6	Förorenade jord- och muddermassor	0,7	F
Totalt farligt avfall		**Total mängd farligt avfall**	**25,4**	**D**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,0	A
	03.1	Kemiska rester och avlagringar	..	..
	03.2	Avloppsslam från industrier	..	..
	03.2	*Avloppsslam från industrier, torrvikt*	..	..
	05.	Sjukvårdsavfall och biologiskt avfall	0,0	A
	06.	Metallavfall	1,3	D
	07.1	Glasavfall	0,0	E
	07.2	Pappers- och pappavfall	0,2	E
	07.4	Plastavfall	0,1	G
	07.5	Träavfall	0,3	D
	07.6	Textilavfall	0,0	A
	08.	Kasserad utrustning	0,0	A
	08.41	Batterier och ackumulatorer	0,0	A
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,0	G
	10.1	Hushållsavfall och liknande avfall	0,4	F
	10.2	Blandade och ej differentierade material	..	..
	10.3	Sorteringsrester	0,2	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	1,7	F
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**12,0**	**B**
Totalt avfall		**Total mängd avfall**	**37,4**	**C**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DG+DH Tillverkning av kemikalier och kemiska produkter samt gummi- och plastvaror				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	33,1	E
	01.2	Surt, alkaliskt eller salthaltigt avfall	2,4	E
	01.3	Oljeavfall	4,8	E
	01.4	Förbrukade kemiska katalysatorer	..	..
	02.	Avfall av kemiska beredningar	8,2	E
	03.1	Kemiska rester och avlagringar	12,9	E
	03.2	Avloppsslam från industrier	33,7	B
	03.2	*Avloppsslam från industrier, torrvikt*	*1,2*	*D*
	05.	Sjukvårdsavfall och biologiskt avfall	0,3	D
	06.	Metallavfall	0,7	D
	07.1	Glasavfall	0,0	G
	07.5	Träavfall	0,1	F
	07.7	Avfall innehållande PCB	..	..
	08.	Kasserad utrustning	0,5	E
	08.41	Batterier och ackumulatorer	0,0	E
	10.2	Blandade och ej differentierade material	1,9	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,4	B
	12.4	Avfall från förbränning	..	..
	12.6	Förorenade jord- och muddermassor	10,4	A
Totalt farligt avfall		**Total mängd farligt avfall**	**110,6**	**D**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	2,9	E
	01.4	Förbrukade kemiska katalysatorer	..	..
	02.	Avfall av kemiska beredningar	16,0	F
	03.1	Kemiska rester och avlagringar	40,6	E
	03.2	Avloppsslam från industrier	53,3	E
	03.2	*Avloppsslam från industrier, torrvikt*	*9,4*	*E*
	05.	Sjukvårdsavfall och biologiskt avfall	..	..
	06.	Metallavfall	12,3	D
	07.1	Glasavfall	0,5	E
	07.2	Pappers- och pappavfall	11,1	E
	07.3	Gummiavfall	4,6	E
	07.4	Plastavfall	31,7	E
	07.5	Träavfall	9,7	D
	08.	Kasserad utrustning	0,3	E
	08.41	Batterier och ackumulatorer	0,0	F
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,8	E
	10.1	Hushållsavfall och liknande avfall	3,3	D
	10.2	Blandade och ej differentierade material	44,3	E
	11.	Vanligt slam (exkl. 11.3)	14,8	F
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*2,7*	*F*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	28,4	E
	12.4	Avfall från förbränning	..	..
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**279,7**	**D**
Totalt avfall		**Total mängd avfall**	**390,4**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DI Tillverkning av icke-metalliska mineraliska produkter				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,1	G
	01.2	Surt, alkaliskt eller salthaltigt avfall	1,0	B
	01.3	Oljeavfall	0,7	E
	02.	Avfall av kemiska beredningar	1,1	F
	03.1	Kemiska rester och avlagringar	0,6	F
	03.2	Avloppsslam från industrier	..	..
	03.2	*Avloppsslam från industrier, torrvikt*	..	..
	07.1	Glasavfall	..	..
	07.7	Avfall innehållande PCB	..	..
	08.	Kasserad utrustning	0,1	E
	08.41	Batterier och ackumulatorer	0,0	F
	10.2	Blandade och ej differentierade material	..	..
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,1	E
	12.4	Avfall från förbränning	0,7	A
	12.6	Förorenade jord- och muddermassor	..	..
Totalt farligt avfall		**Total mängd farligt avfall**	**4,6**	**D**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,0	G
	03.1	Kemiska rester och avlagringar	..	..
		Total mängd avfall	8,3	F
	03.2	*Avloppsslam från industrier, torrvikt*	*3,9*	*G*
	06.	Metallavfall	6,1	E
	07.1	Glasavfall	38,8	F
	07.2	Pappers- och pappavfall	4,4	F
	07.3	Gummiavfall	..	..
	07.4	Plastavfall	1,8	E
	07.5	Träavfall	7,8	E
	08.	Kasserad utrustning	0,1	D
	08.41	Batterier och ackumulatorer	..	..
	10.1	Hushållsavfall och liknande avfall	1,5	F
	10.2	Blandade och ej differentierade material	6,6	E
	11.	Vanligt slam (exkl. 11.3)	4,1	G
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*1,2*	*G*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	117,7	E
	12.4	Avfall från förbränning	44,2	A
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**243,7**	**D**
Totalt avfall		**Total mängd avfall**	**248,3**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DJ Metallframställning och metallvarutillverkning				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	1,1	E
	01.2	Surt, alkaliskt eller salthaltigt avfall	74,3	G
	01.3	Oljeavfall	43,6	F
	01.4	Förbrukade kemiska katalysatorer	..	..
	02.	Avfall av kemiska beredningar	2,8	F
	03.1	Kemiska rester och avlagringar	..	..
	03.2	Avloppsslam från industrier	64,3	E
	03.2	*Avloppsslam från industrier, torrvikt*	*16,4*	*E*
	06.	Metallavfall	8,7	F
	07.5	Träavfall	0,2	F
	08.	Kasserad utrustning	0,3	E
	08.41	Batterier och ackumulatorer	0,2	E
	10.2	Blandade och ej differentierade material	0,7	E
	12.	Mineralavfall (exkl. 12.4 och 12.6)	9,2	E
	12.4	Avfall från förbränning	88,2	E
	13.	Stelnat, stabiliserat och förglasat avfall	0,0	G
Totalt farligt avfall		**Total mängd farligt avfall**	**341,9**	**D**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	1,5	F
	02.	Avfall av kemiska beredningar	5,5	G
	03.1	Kemiska rester och avlagringar	114,2	E
	03.2	Avloppsslam från industrier	43,9	E
	03.2	*Avloppsslam från industrier, torrvikt*	*4,8*	*E*
	06.	Metallavfall	605,6	D
	07.1	Glasavfall	0,1	F
	07.2	Pappers- och pappavfall	19,0	F
	07.3	Gummiavfall	0,0	F
	07.4	Plastavfall	2,0	E
	07.5	Träavfall	23,2	E
	07.6	Textilavfall	0,1	F
	08.	Kasserad utrustning	0,4	E
	08.41	Batterier och ackumulatorer	0,1	F
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,1	F
	10.1	Hushållsavfall och liknande avfall	8,3	D
	10.2	Blandade och ej differentierade material	..	..
	10.3	Sorteringsrester	..	..
	11.	Vanligt slam (exkl. 11.3)	0,0	F
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*0,0*	*F*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	109,4	E
	12.4	Avfall från förbränning	1 701,2	E
	13.	Stelnat, stabiliserat och förglasat avfall	0,0	G
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**2 671,4**	**E**
Totalt avfall		**Total mängd avfall**	**3 013,3**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DK+DL+DM Tillverkning av maskiner, el- och optikprodukter samt transportmedel				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	1,3	D
	01.2	Surt, alkaliskt eller salthaltigt avfall	5,7	D
	01.3	Oljeavfall	27,1	D
	02.	Avfall av kemiska beredningar	8,2	C
	03.1	Kemiska rester och avlagringar	8,4	E
	03.2	Avloppsslam från industrier	8,5	E
	03.2	*Avloppsslam från industrier, torrvikt*	*2,3*	*E*
	06.	Metallavfall	0,8	G
	07.1	Glasavfall	0,0	G
	07.5	Träavfall	0,1	F
	07.7	Avfall innehållande PCB	0,0	A
	08.	Kasserad utrustning	0,8	D
	08.1	Uttjänta fordon	0,0	F
	08.41	Batterier och ackumulatorer	0,4	E
	10.2	Blandade och ej differentierade material	0,2	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,5	E
	12.4	Avfall från förbränning	0,2	F
	12.6	Förorenade jord- och muddermassor	1,4	C
Totalt farligt avfall		**Total mängd farligt avfall**	**63,7**	**D**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	2,7	F
	01.4	Förbrukade kemiska katalysatorer	..	..
	02.	Avfall av kemiska beredningar	0,5	D
	03.1	Kemiska rester och avlagringar	0,9	G
	03.2	Avloppsslam från industrier	0,7	F
	03.2	*Avloppsslam från industrier, torrvikt*	*0,1*	*E*
	05.	Sjukvårdsavfall och biologiskt avfall	..	..
	06.	Metallavfall	589,1	C
	07.1	Glasavfall	0,6	F
	07.2	Pappers- och pappavfall	20,2	D
	07.3	Gummiavfall	..	..
	07.4	Plastavfall	7,1	E
	07.5	Träavfall	30,4	C
	08.	Kasserad utrustning	0,8	E
	08.41	Batterier och ackumulatorer	0,1	E
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	..	..
	10.1	Hushållsavfall och liknande avfall	10,1	E
	10.2	Blandade och ej differentierade material	51,7	D
	10.3	Sorteringsrester	..	..
	11.	Vanligt slam (exkl. 11.3)	0,9	G
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*0,0*	*E*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	134,9	C

	12.4	Avfall från förbränning	15,8	E
	13.	Stelnat, stabiliserat och förglasat avfall	0,0	F
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**866,8**	**D**
Totalt avfall		**Total mängd avfall**	**930,5**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE DN Övrig tillverkning (exkl återvinning)				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,5	G
	01.3	Oljeavfall	1,0	G
	02.	Avfall av kemiska beredningar	0,5	G
	03.1	Kemiska rester och avlagringar	0,5	G
	03.2	Avloppsslam från industrier	0,5	G
	03.2	*Avloppsslam från industrier, torrvikt*	*0,1*	*G*
	08.	Kasserad utrustning	0,1	G
	08.41	Batterier och ackumulatorer	0,0	G
Totalt farligt avfall		**Total mängd farligt avfall**	**3,1**	**F**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,5	G
	03.1	Kemiska rester och avlagringar	0,5	G
	03.2	Avloppsslam från industrier	1,0	G
	03.2	*Avloppsslam från industrier, torrvikt*	*0,3*	*G*
	06.	Metallavfall	10,0	G
	07.1	Glasavfall	1,0	G
	07.2	Pappers- och pappavfall	1,0	G
	07.3	Gummiavfall	1,0	G
	07.4	Plastavfall	5,0	G
	07.5	Träavfall	5,0	G
	07.6	Textilavfall	0,9	G
	08.	Kasserad utrustning	0,1	G
	10.1	Hushållsavfall och liknande avfall	2,0	G
	10.2	Blandade och ej differentierade material	56,0	G
	12.	Mineralavfall (exkl. 12.4 och 12.6)	1,0	G
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**85,0**	**F**
Totalt avfall		**Total mängd avfall**	**88,1**	**F**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE E El-, gas-, värme- och vattenförsörjning				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,0	E
	01.2	Surt, alkaliskt eller salthaltigt avfall	..	..
	01.3	Oljeavfall	2,2	E
	02.	Avfall av kemiska beredningar	..	..
	03.1	Kemiska rester och avlagringar	0,4	E
	03.2	Avloppsslam från industrier	0,6	E
	03.2	*Avloppsslam från industrier, torrvikt*	*0,1*	*E*
	05.	Sjukvårdsavfall och biologiskt avfall	0,0	G
	06.	Metallavfall	0,4	F
	07.1	Glasavfall	..	..
	07.5	Träavfall	5,5	F
	07.7	Avfall innehållande PCB	0,1	E
	08.	Kasserad utrustning	1,5	E
	08.1	Uttjänta fordon	0,0	F
	08.41	Batterier och ackumulatorer	0,1	D
	10.2	Blandade och ej differentierade material	1,1	E
	12.	Mineralavfall (exkl. 12.4 och 12.6)	3,8	F
	12.4	Avfall från förbränning	167,8	C
	12.6	Förorenade jord- och muddermassor	7,7	F
Totalt farligt avfall		**Total mängd farligt avfall**	**191,4**	**C**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	0,4	C
	01.4	Förbrukade kemiska katalysatorer	0,0	E
	02.	Avfall av kemiska beredningar	0,0	E
	03.1	Kemiska rester och avlagringar	0,1	E
	03.2	Avloppsslam från industrier	2,2	F
	03.2	*Avloppsslam från industrier, torrvikt*	*0,3*	*F*
	05.	Sjukvårdsavfall och biologiskt avfall	..	..
	06.	Metallavfall	47,0	C
	07.1	Glasavfall	0,0	E
	07.2	Pappers- och pappavfall	2,2	F
	07.3	Gummiavfall	..	..
	07.4	Plastavfall	0,1	E
	07.5	Träavfall	1,5	E
	07.6	Textilavfall	..	..
	08.	Kasserad utrustning	0,9	E
	08.1	Uttjänta fordon	0,0	F
	08.41	Batterier och ackumulatorer	0,0	E
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,2	G
	10.1	Hushållsavfall och liknande avfall	2,4	E
	10.2	Blandade och ej differentierade material	8,9	E
	10.3	Sorteringsrester	0,6	E
	11.	Vanligt slam (exkl. 11.3)	1 067,0	F
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*8,8*	*F*
	11.3	Muddermassor	0,5	E

	12.	Mineralavfall (exkl. 12.4 och 12.6)	6,2	E
	12.4	Avfall från förbränning	1 007,4	C
	13.	Stelnat, stabiliserat och förglasat avfall	40,1	C
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**2 188,0**	**D**
Totalt avfall		**Total mängd avfall**	**2 379,4**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE F Byggverk-samhet				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osä-kerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,3	F
	01.2	Surt, alkaliskt eller salthaltigt avfall	1,0	F
	01.3	Oljeavfall	7,0	F
	02.	Avfall av kemiska beredningar	5,5	F
	03.1	Kemiska rester och avlagringar	13,9	F
	03.2	Avloppsslam från industrier	1,1	F
	06.	Metallavfall	0,1	F
	07.5	Träavfall	0,4	F
	07.7	Avfall innehållande PCB	0,2	F
	08.	Kasserad utrustning	2,4	F
	08.41	Batterier och ackumulatorer	0,5	F
	10.2	Blandade och ej differentierade material	0,1	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	463,5	F
	12.6	Förorenade jord- och muddermassor	398,2	F
Totalt farligt avfall		**Total mängd farligt avfall**	**894,1**	**F**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,0	F
	03.1	Kemiska rester och avlagringar	0,0	F
	03.2	Avloppsslam från industrier	0,0	F
	06.	Metallavfall	196,2	F
	07.1	Glasavfall	0,6	F
	07.2	Pappers- och pappavfall	9,0	F
	07.3	Gummiavfall	0,0	F
	07.4	Plastavfall	0,4	F
	07.5	Träavfall	7,6	F
	08.	Kasserad utrustning	0,8	F
	08.41	Batterier och ackumulatorer	0,0	F
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,3	F
	10.1	Hushållsavfall och liknande avfall	20,0	E
	10.2	Blandade och ej differentierade material	1 109,9	F
	11.	Vanligt slam (exkl. 11.3)	0,0	F
	11.3	Muddermassor	276,9	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	6 566,7	F

Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**8 188,6**	**F**
Totalt avfall		**Total mängd avfall**	**9 082,7**	**F**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE G-Q Tjänster (exkl partihandel med avfallsprodukter och skrot samt avloppsrening, avfallshantering, renhållning o.d.)				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,9	E
	01.2	Surt, alkaliskt eller salthaltigt avfall	3,1	E
	01.3	Oljeavfall	22,0	E
	02.	Avfall av kemiska beredningar	6,6	E
	03.1	Kemiska rester och avlagringar	122,4	E
	03.2	Avloppsslam från industrier	25,0	E
	03.2	*Avloppsslam från industrier, torrvikt*	*5,0*	*E*
	05.	Sjukvårdsavfall och biologiskt avfall	3,5	D
	06.	Metallavfall	0,0	E
	07.5	Träavfall	2,0	E
	07.7	Avfall innehållande PCB	0,1	E
	08.	Kasserad utrustning	4,5	E
	08.1	Uttjänta fordon	151,6	F
	08.41	Batterier och ackumulatorer	27,1	E
	10.2	Blandade och ej differentierade material	2,2	D
	12.	Mineralavfall (exkl. 12.4 och 12.6)	1,5	E
	12.4	Avfall från förbränning	0,1	E
	12.6	Förorenade jord- och muddermassor	4,1	E
Totalt farligt avfall		**Total mängd farligt avfall**	**376,6**	**D**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,0	E
	05.	Sjukvårdsavfall och biologiskt avfall	8,4	E
	06.	Metallavfall	3,0	D
	07.1	Glasavfall	1,5	D
	07.2	Pappers- och pappavfall	181,4	E
	07.3	Gummiavfall	0,0	E
	07.4	Plastavfall	0,6	D
	07.5	Träavfall	1,8	D
	08.	Kasserad utrustning	0,0	D
	08.41	Batterier och ackumulatorer	0,0	E
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	428,5	E
	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	0,2	E
	09.3	Animalisk faeces, animalisk urin och gödsel	3,2	D
	10.1	Hushållsavfall och liknande avfall	253,8	D
	10.2	Blandade och ej differentierade material	272,5	D

	10.3	Sorteringsrester	0,3	D
	11.	Vanligt slam (exkl. 11.3)	14,9	D
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*4,3*	*D*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,3	D
	12.4	Avfall från förbränning	0,1	D
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**1 170,8**	**D**
Totalt avfall		**Total mängd avfall**	**1 547,4**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE 37 Återvinning				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,1	E
	01.2	Surt, alkaliskt eller salthaltigt avfall	0,0	E
	01.3	Oljeavfall	1,2	E
	02.	Avfall av kemiska beredningar	0,0	E
	03.1	Kemiska rester och avlagringar	0,9	E
	03.2	Avloppsslam från industrier	1,0	E
	07.5	Träavfall	0,1	E
	07.7	Avfall innehållande PCB	0,0	E
	08.	Kasserad utrustning	32,1	E
	08.41	Batterier och ackumulatorer	1,3	E
	10.3	Sorteringsrester	1,2	E
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,0	E
	12.6	Förorenade jord- och muddermassor	0,7	E
Totalt farligt avfall		**Total mängd farligt avfall**	**38,7**	**D**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,0	E
	03.1	Kemiska rester och avlagringar	0,0	E
	06.	Metallavfall	1,6	E
	07.1	Glasavfall	0,9	E
	07.2	Pappers- och pappavfall	0,3	E
	07.3	Gummiavfall	0,2	E
	07.4	Plastavfall	0,3	E
	07.5	Träavfall	2,1	E
	08.	Kasserad utrustning	1,5	E
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,2	E
	10.1	Hushållsavfall och liknande avfall	0,4	E
	10.2	Blandade och ej differentierade material	5,6	E
	10.3	Sorteringsrester	415,9	E
	11.	Vanligt slam (exkl. 11.3)	0,7	E
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*3,3*	*E*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	1,5	E
Totalt icke-farligt		**Total mängd icke-farligt avfall**	**433,8**	**D**

avfall				
Totalt avfall		**Total mängd avfall**	**472,5**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE 51.57 Partihandel med avfallsprodukter och skrot				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,1	F
	01.2	Surt, alkaliskt eller salthaltigt avfall	0,0	E
	01.3	Oljeavfall	2,9	D
	02.	Avfall av kemiska beredningar	0,6	E
	03.1	Kemiska rester och avlagringar	0,9	E
	03.2	Avloppsslam från industrier	0,5	E
	07.5	Träavfall	0,1	E
	07.7	Avfall innehållande PCB	0,0	E
	08.	Kasserad utrustning	14,9	E
	08.41	Batterier och ackumulatorer	5,4	D
	10.3	Sorteringsrester	1,2	E
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,0	E
	12.6	Förorenade jord- och muddermassor	0,7	E
Totalt farligt avfall		**Total mängd farligt avfall**	**27,2**	**D**
Icke-farligt avfall	01.4	Förbrukade kemiska katalysatorer	0,5	G
	02.	Avfall av kemiska beredningar	0,0	E
	03.1	Kemiska rester och avlagringar	0,0	E
	06.	Metallavfall	11,7	E
	07.1	Glasavfall	3,9	E
	07.2	Pappers- och pappavfall	0,3	E
	07.3	Gummiavfall	5,4	F
	07.4	Plastavfall	0,3	E
	07.5	Träavfall	1,8	E
	08.	Kasserad utrustning	1,5	E
	08.1	Uttjänta fordon	260,8	B
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,1	E
	10.1	Hushållsavfall och liknande avfall	0,4	E
	10.2	Blandade och ej differentierade material	6,5	E
	10.3	Sorteringsrester	334,2	E
	11.	Vanligt slam (exkl. 11.3)	1,4	E
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*0,3*	*E*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	1,3	E
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**630,2**	**D**
Totalt avfall		**Total mängd avfall**	**657,4**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.

Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

NACE 90 Avloppsrening, avfallshantering, renhållning o.d.				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	..	..
	01.2	Surt, alkaliskt eller salthaltigt avfall	0,0	E
	01.3	Oljeavfall	8,8	E
	02.	Avfall av kemiska beredningar	..	..
	03.1	Kemiska rester och avlagringar	..	..
	03.2	Avloppsslam från industrier	1,7	E
	03.2	*Avloppsslam från industrier, torrvikt*	*14,0*	*E*
	06.	Metallavfall	..	..
	07.1	Glasavfall	7,2	E
	07.5	Träavfall	..	..
	07.7	Avfall innehållande PCB	..	..
	08.	Kasserad utrustning	0,9	E
	08.41	Batterier och ackumulatorer	0,0	E
	10.2	Blandade och ej differentierade material	5,1	E
	12.	Mineralavfall (exkl. 12.4 och 12.6)	2,3	E
	12.4	Avfall från förbränning	35,9	E
	12.6	Förorenade jord- och muddermassor	..	..
Totalt farligt avfall		**Total mängd farligt avfall**	**165,6**	**D**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,0	E
	03.1	Kemiska rester och avlagringar	0,0	E
	03.2	Avloppsslam från industrier	3 796,4	E
	03.2	*Avloppsslam från industrier, torrvikt*	*36,6*	*E*
	06.	Metallavfall	153,8	E
	07.1	Glasavfall	..	..
	07.2	Pappers- och pappavfall	74,8	E
	07.3	Gummiavfall	0,1	E
	07.4	Plastavfall	4,7	E
	07.5	Träavfall	295,7	E
	08.	Kasserad utrustning	..	..
	08.41	Batterier och ackumulatorer	..	..
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	115,7	E
	09.3	Animalisk faeces, animalisk urin och gödsel	7,7	D
	10.1	Hushållsavfall och liknande avfall	13,8	E
	10.2	Blandade och ej differentierade material	727,4	D
	10.3	Sorteringsrester	429,8	E
	11.	Vanligt slam (exkl. 11.3)	899,5	D
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*225,2*	*C*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	322,4	E
	12.4	Avfall från förbränning	..	..
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**6 858,7**	**D**
Totalt avfall		**Total mängd avfall**	**7 024,3**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Avfall från hushåll				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	0,9	F
	01.2	Surt, alkaliskt eller salthaltigt avfall	0,6	F
	01.3	Oljeavfall	3,1	F
	02.	Avfall av kemiska beredningar	14,1	F
	07.5	Träavfall	14,6	E
	08.	Kasserad utrustning	139,1	E
	08.1	Uttjänta fordon	305,2	D
	08.41	Batterier och ackumulatorer	6,8	F
	10.2	Blandade och ej differentierade material	3,0	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	1,8	G
Totalt farligt avfall		**Total mängd farligt avfall**	**489,1**	**D**
Icke-farligt avfall	02.	Avfall av kemiska beredningar	0,9	E
	06.	Metallavfall	165,1	E
	07.1	Glasavfall	266,0	D
	07.2	Pappers- och pappavfall	537,4	E
	07.3	Gummiavfall	31,4	F
	07.4	Plastavfall	47,8	D
	08.41	Batterier och ackumulatorer	1,4	D
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	386,0	E
	10.1	Hushållsavfall och liknande avfall	2 327,6	E
	11.	Vanligt slam (exkl. 11.3)	879,0	F
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*87,9*	*E*
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**4 642,7**	**D**
Totalt avfall		**Total mängd avfall**	**5 131,7**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Totalt				
Uppkommet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	44,0	E
	01.2	Surt, alkaliskt eller salthaltigt avfall	89,1	F
	01.3	Oljeavfall	137,3	E
	01.4	Förbrukade kemiska katalysatorer	1,2	C
	02.	Avfall av kemiska beredningar	59,9	D
	03.1	Kemiska rester och avlagringar	301,2	D
	03.2	Avloppsslam från industrier	150,9	D
	03.2	*Avloppsslam från industrier, torrvikt*	*27,2*	*D*
	05.	Sjukvårdsavfall och biologiskt avfall	3,8	D
	06.	Metallavfall	10,8	F
	07.1	Glasavfall	7,2	D
	07.5	Träavfall	24,8	D
	07.7	Avfall innehållande PCB	0,4	E
	08.	Kasserad utrustning	200,9	E
	08.1	Uttjänta fordon	471,0	E
	08.41	Batterier och ackumulatorer	43,2	E
	10.2	Blandade och ej differentierade material	15,1	D
	10.3	Sorteringsrester	2,3	E
	12.	Mineralavfall (exkl. 12.4 och 12.6)	483,3	E
	12.4	Avfall från förbränning	295,9	D
	12.6	Förorenade jord- och muddermassor	434,7	E
	13.	Stelnat, stabiliserat och förglasat avfall	0,0	G
Totalt farligt avfall		**Total mängd farligt avfall**	**2 777,1**	**D**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	179,5	C
	01.4	Förbrukade kemiska katalysatorer	0,5	G
	02.	Avfall av kemiska beredningar	35,1	F
	03.1	Kemiska rester och avlagringar	418,3	D
	03.2	Avloppsslam från industrier	4 538,7	D
	03.2	*Avloppsslam från industrier, torrvikt*	*315,1*	*D*
	05.	Sjukvårdsavfall och biologiskt avfall	8,5	D
	06.	Metallavfall	1 994,5	D
	07.1	Glasavfall	336,1	D
	07.2	Pappers- och pappavfall	2 405,4	C
	07.3	Gummiavfall	50,1	E
	07.4	Plastavfall	188,2	E
	07.5	Träavfall	22 276,7	D
	07.6	Textilavfall	20,0	F
	08.	Kasserad utrustning	12,9	D
	08.1	Uttjänta fordon	260,9	B
	08.41	Batterier och ackumulatorer	1,6	C
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	4 511,5	E
	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	145,2	E
	09.3	Animalisk faeces, animalisk urin och gödsel	97,6	C

	10.1	Hushållsavfall och liknande avfall	2 671,3	E
	10.2	Blandade och ej differentierade material	2 418,0	E
	10.3	Sorteringsrester	1 273,2	D
	11.	Vanligt slam (exkl. 11.3)	3 928,8	E
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*484,9*	*D*
	11.3	Muddermassor	277,4	F
	12.	Mineralavfall (exkl. 12.4 och 12.6)	69 512,2	B
	12.4	Avfall från förbränning	3 133,1	D
	13.	Stelnat, stabiliserat och förglasat avfall	40,2	C
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**120 735,5**	**C**
Totalt avfall		**Total mängd avfall**	**123 512,7**	**C**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Behandlad mängd avfall totalt (per behandlingsmetod) 2006

Behandling Totalt	**Mängd, 1000 ton**	**Osäkerhet**
Total mängd behandlat avfall 2006	**112 168,3**	**D**

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Återvunnet avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	..	..
	03.1	Kemiska rester och avlagringar	25,2	G
	08.	Kasserad utrustning	65,0	F
	08.41	Batterier och ackumulatorer	..	..
	12.	Mineralavfall (exkl. 12.4 och 12.6)	33,4	D
	12.4	Avfall från förbränning	58,2	F
	12.6	Förorenade jord- och muddermassor	83,7	D
Totalt farligt avfall		**Total mängd farligt avfall**	**338,9**	**E**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	39,8	E
	03.1	Kemiska rester och avlagringar	58,9	E
	03.2	Avloppsslam från industrier	22,4	G
	03.2	*Avloppsslam från industrier, torrvikt*	*3,4*	*G*
	06.	Metallavfall	1 866,1	G
	07.1	Glasavfall	..	..
	07.2	Pappers- och pappavfall	1 845,6	E
	07.3	Gummiavfall	35,4	F
	07.4	Plastavfall	..	..
	07.5	Träavfall	10 916,4	G
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	..	..

	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	131,3	E
	09.3	Animalisk faeces, animalisk urin och gödsel	160,7	D
	10.1	Hushållsavfall och liknande avfall	..	..
	10.2	Blandade och ej differentierade material	0,2	D
	10.3	Sorteringsrester	29,5	D
	11.	Vanligt slam (exkl. 11.3)	714,8	G
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*131,6*	*G*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	9 197,6	G
	12.4	Avfall från förbränning	317,8	G
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**26 059,2**	**E**
Återvunnet Totalt		**Total mängd Återvunnet**	**26 398,1**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Förbränt (R1) 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	17,1	G
	01.3	Oljeavfall	9,3	G
	02.	Avfall av kemiska beredningar	37,4	G
	03.1	Kemiska rester och avlagringar	89,1	G
	05.	Sjukvårdsavfall och biologiskt avfall	3,5	E
	07.5	Träavfall	52,4	E
Totalt farligt avfall		**Total mängd farligt avfall**	**208,8**	**F**
Icke-farligt avfall	03.1	Kemiska rester och avlagringar	..	..
	03.2	Avloppsslam från industrier	259,8	F
	03.2	*Avloppsslam från industrier, torrvikt*	*156,6*	*F*
	05.	Sjukvårdsavfall och biologiskt avfall	1,6	F
	06.	Metallavfall	..	..
	07.2	Pappers- och pappavfall	374,3	G
	07.3	Gummiavfall	69,9	E
	07.4	Plastavfall	46,4	E
	07.5	Träavfall	10 688,2	G
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	3 106,1	G
	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	22,1	E
	10.1	Hushållsavfall och liknande avfall	2 140,1	D
	10.2	Blandade och ej differentierade material	1 167,6	D
	10.3	Sorteringsrester	473,8	E
	11.	Vanligt slam (exkl. 11.3)	..	..
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	..	..
	12.	Mineralavfall (exkl. 12.4 och 12.6)	0,2	F
	12.4	Avfall från förbränning	..	..

Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**18 587,7**	**E**
Förbränt R1 Totalt		**Total mängd Förbränt R1**	**18 796,5**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Förbränt (D10) 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	3,6	B
	01.3	Oljeavfall	0,5	B
	02.	Avfall av kemiska beredningar	17,9	B
	03.1	Kemiska rester och avlagringar	46,5	B
	03.2	Avloppsslam från industrier	26,0	A
	03.2	*Avloppsslam från industrier, torrvikt*	*0,5*	*A*
	05.	Sjukvårdsavfall och biologiskt avfall	0,3	E
	07.5	Träavfall	1,5	B
	08.	Kasserad utrustning	2,7	B
	10.2	Blandade och ej differentierade material	4,5	B
	12.4	Avfall från förbränning	0,0	B
Totalt farligt avfall		**Total mängd farligt avfall**	**103,5**	**A**
Icke-farligt avfall	05.	Sjukvårdsavfall och biologiskt avfall	0,7	E
	08.41	Batterier och ackumulatorer	0,1	B
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,5	E
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**1,2**	**D**
Förbränt D10 Totalt		**Total mängd Förbränt D10**	**104,7**	**A**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Deponerat avfall 2006	**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
Farligt avfall	01.1	Lösningsmedelsavfall	..	..
	01.2	Surt, alkaliskt eller salthaltigt avfall	31,2	E
	01.3	Oljeavfall	..	..
	02.	Avfall av kemiska beredningar	0,3	F
	03.1	Kemiska rester och avlagringar	..	..
	03.2	Avloppsslam från industrier	39,6	E
	03.2	*Avloppsslam från industrier, torrvikt*	*11,3*	*E*
	07.1	Glasavfall	7,2	D
	07.5	Träavfall	..	..
	08.41	Batterier och ackumulatorer	..	..
	10.2	Blandade och ej differentierade material	3,3	D

	12.	Mineralavfall (exkl. 12.4 och 12.6)	58,7	F
	12.4	Avfall från förbränning	111,9	G
	12.6	Förorenade jord- och muddermassor	122,3	D
Totalt farligt avfall		**Total mängd farligt avfall**	**378,0**	**D**
Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	21,6	E
	02.	Avfall av kemiska beredningar	2,2	D
	03.1	Kemiska rester och avlagringar	199,4	D
	03.2	Avloppsslam från industrier	44,4	G
	03.2	*Avloppsslam från industrier, torrvikt*	*11,9*	*G*
	05.	Sjukvårdsavfall och biologiskt avfall	..	..
	06.	Metallavfall	14,1	F
	07.1	Glasavfall	1,1	D
	07.2	Pappers- och pappavfall	39,0	D
	07.3	Gummiavfall	..	..
	07.4	Plastavfall	1,3	D
	07.5	Träavfall	..	..
	07.6	Textilavfall	0,2	D
	08.	Kasserad utrustning	..	..
	08.41	Batterier och ackumulatorer	..	..
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	11,5	G
	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	0,3	D
	09.3	Animalisk faeces, animalisk urin och gödsel	0,4	D
	10.1	Hushållsavfall och liknande avfall	203,8	F
	10.2	Blandade och ej differentierade material	482,7	E
	10.3	Sorteringsrester	311,5	D
	11.	Vanligt slam (exkl. 11.3)	137,6	F
	11.	*Vanligt slam (exkl. 11.3), torrvikt*	*26,4*	*F*
	11.3	Muddermassor	261,1	E
	11.3	*Muddermassor, torrvikt*	*19,6*	*E*
	12.	Mineralavfall (exkl. 12.4 och 12.6)	62 865,9	G
	12.4	Avfall från förbränning	984,3	G
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**65 585,4**	**D**
Deponerat Totalt		**Total mängd Deponerat**	**65 963,4**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Utsläpp & markbe-handling 2006	EWCStat	Avfallsslag	Mängd, 1000 ton	Osäkerhet
Icke-farligt avfall	03.2	Avloppsslam från industrier	659,7	F
	03.2	*Avloppsslam från industrier, torrvikt*	*4,0*	*F*
	07.2	Pappers- och pappavfall	..	..
	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	..	..
	11.	Vanligt slam (exkl. 11.3)	..	..

	11.	*Vanligt slam (exkl. 11.3), torrvikt*	..	..
	11.3	Muddermassor	15,8	E
	11.3	*Muddermassor, torrvikt*	*1,2*	*E*
	12.4	Avfall från förbränning	..	..
Totalt icke-farligt avfall		**Total mängd icke-farligt avfall**	**905,9**	**E**
Utsläpp & markbehandling Totalt		**Total mängd Utsläpp & markbehandling**	**905,9**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet.
Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Behandlad mängd avfall per sektor 2006

Totalt	**Behandling Totalt**	**Mängd, 1000 ton**	**Osäkerhet**
	Total mängd behandlat avfall 2006	**112 168,3**	**D**

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Utvinning av mineral						
NACE C	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Icke-farligt avfall	06.	Metallavfall	1,1	A
			10.2	Blandade och ej differentierade material	0,1	A
			12.	Mineralavfall (exkl. 12.4 och 12.6)	61 819,7	A
		Total mängd icke-farligt avfall			**61 820,8**	**A**
	Total mängd Deponerat				**61 820,8**	**A**
	Återvunnet	Icke-farligt avfall	11.	Vanligt slam (exkl. 11.3)	69,4	A
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	*17,4*	*A*
			12.	Mineralavfall (exkl. 12.4 och 12.6)	..	..
			12.4	Avfall från förbränning	..	..
		Total mängd icke-farligt avfall			**436,8**	**A**
	Total mängd Återvunnet				**436,8**	**A**
	Behandlat Totalt NACE C				**62 257,6**	**A**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmargina-

ler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Livsmedels-, dryckesvaru och tobaksvaru-framställning						
NACE DA	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Icke-farligt avfall	03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier, torrvikt*	..	..
			09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	..	..
			11.	Vanligt slam (exkl. 11.3)	..	..
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	..	..
			12.	Mineralavfall (exkl. 12.4 och 12.6)	..	..
		Total mängd icke-farligt avfall			**66,9**	**F**
	Total mängd Deponerat				**66,9**	**F**
	Förbränt R1	Farligt avfall	01.1	Lösningsmedelsavfall	..	..
			01.3	Oljeavfall	..	..
		Total mängd farligt avfall			**0,0**	**E**
		Icke-farligt avfall	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	8,0	F
		Total mängd icke-farligt avfall			8,0	F
	Total mängd Förbränt R1				8,1	F
	Utsläpp & markbe-handling	Icke-farligt avfall	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	..	..
		Total mängd icke-farligt avfall			**..**	**..**
	Total mängd Utsläpp & markbehandling				**..**	**..**
	Återvunnet	Icke-farligt avfall	03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier, torrvikt*	..	..
			11.	Vanligt slam (exkl. 11.3)	..	..
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	..	..
		Total mängd icke-farligt avfall			**11,4**	**F**
	Total mängd Återvunnet				**11,4**	**F**
	Behandlat Totalt NACE DA				**90,0**	**F**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Trävarutillverkning

NACE DD	Behandling		EWCStat	Avfallsslag	Mängd, 1000 ton	Osäkerhet
	Förbränt R1	Icke-farligt avfall	07.2	Pappers- och pappavfall	0,0	G
			07.5	Träavfall	2 527,9	E
		Total mängd icke-farligt avfall			**2 527,9**	**E**
	Total mängd Förbränt R1				**2 527,9**	**E**
	Återvunnet	Icke-farligt avfall	07.5	Träavfall	1 968,3	E
		Total mängd icke-farligt avfall			**1 968,3**	**E**
	Total mängd Återvunnet				**1 968,3**	**E**
	Behandlat Totalt NACE DD				**4 496,2**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Massa-, pappers- och pappersvarutillverkning; förlagsverksamhet och grafisk produktion						
NACE DE	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	..	..
			03.1	Kemiska rester och avlagringar	..	..
			07.2	Pappers- och pappavfall	..	..
			07.5	Träavfall	..	..
			12.4	Avfall från förbränning	61,5	B
		Total mängd icke-farligt avfall			**273,3**	**B**
	Total mängd Deponerat				**273,3**	**B**
	Förbränt R1	Farligt avfall	01.3	Oljeavfall	..	..
		Total mängd farligt avfall			**..**	**..**
		Icke-farligt avfall	03.2	Avloppsslam från industrier	217,3	A
			03.2	*Avloppsslam från industrier, torrvikt*	*143,9*	*A*
			07.2	Pappers- och pappavfall	362,5	C
			07.5	Träavfall	3 076,0	C
			11.	Vanligt slam (exkl. 11.3)	..	..
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	..	..
			12.4	Avfall från förbränning	..	..
		Total mängd icke-farligt avfall			**3 893,3**	**B**
	Total mängd Förbränt R1				**..**	**..**
	Utsläpp & markbehandling	Icke-farligt avfall	07.2	Pappers- och pappavfall	..	..

			12.4	Avfall från förbränning	..	..
		Total mängd icke-farligt avfall			**26,8**	**C**
	Total mängd Utsläpp & markbehandling				**26,8**	**C**
	Återvunnet	Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	39,8	E
			03.1	Kemiska rester och avlag-ringar	..	..
			07.2	Pappers- och pappavfall	1 775,0	E
			07.5	Träavfall	8 900,0	F
			10.3	Sorteringsrester	..	..
			11.	Vanligt slam (exkl. 11.3)	50,2	E
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	*12,7*	*D*
			12.	Mineralavfall (exkl. 12.4 och 12.6)	..	..
			12.4	Avfall från förbränning	67,0	B
		Total mängd icke-farligt avfall			**10 922,0**	**D**
	Total mängd Återvunnet				**10 922,0**	**D**
	Behandlat Totalt NACE DE				**15 115,6**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Tillverkning av stenkolsprodukter, raffinerade petroleumprodukter och kärnbränsle						
NACE DF	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Förbränt R1	Icke-farligt avfall	06.	Metallavfall	..	..
		Total mängd icke-farligt avfall			**..**	**..**
	Total mängd Förbränt R1				**..**	**..**
	Återvunnet	Farligt avfall	03.1	Kemiska rester och avlag-ringar	..	..
		Total mängd farligt avfall			**..**	**..**
	Total mängd Återvunnet				**..**	**..**
	Behandlat Totalt NACE DF				**13,3**	**F**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Tillverkning av kemikalier och kemiska produkter samt gummi- och plastvaror						
NACE DG+DH	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Icke-farligt avfall	03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier,*	..	..

				torrvikt		
			12.	Mineralavfall (exkl. 12.4 och 12.6)	..	..
		Total mängd icke-farligt avfall			**3,4**	**D**
	Total mängd Deponerat				**3,4**	**D**
	Förbränt D10	Farligt avfall	03.2	Avloppsslam från industrier	26,0	A
			03.2	*Avloppsslam från industrier, torrvikt*	*0,5*	*A*
		Total mängd farligt avfall			**26,0**	**A**
	Total mängd Förbränt D10				**26,0**	**A**
	Förbränt R1	Farligt avfall	01.1	Lösningsmedelsavfall	..	..
			03.1	Kemiska rester och avlag-ringar	..	..
		Total mängd farligt avfall			**21,3**	**E**
		Icke-farligt avfall	07.5	Träavfall	..	..
			10.2	Blandade och ej differentiera-de material	..	..
		Total mängd icke-farligt avfall			**0,2**	**A**
	Total mängd Förbränt R1				**21,4**	**D**
	Återvunnet	Icke-farligt avfall	07.3	Gummiavfall	..	..
			07.4	Plastavfall	..	..
		Total mängd icke-farligt avfall			**54,3**	**E**
	Total mängd Återvunnet				**54,3**	**E**
	Behandlat Totalt DG+DH				**105,1**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Tillverkning av icke-metalliska mineraliska produkter						
NACE DI	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Icke-farligt avfall	03.2	Avloppsslam från industrier	1,3	A
			03.2	*Avloppsslam från industrier, torrvikt*	*0,3*	*A*
			10.2	Blandade och ej differentiera-de material	..	..
			12.	Mineralavfall (exkl. 12.4 och 12.6)	6,3	D
			12.4	Avfall från förbränning	..	..
		Total mängd icke-farligt avfall			**7,9**	**C**
	Total mängd Deponerat				**7,9**	**C**
	Förbränt R1	Farligt avfall	01.3	Oljeavfall	8,0	G

			02.	Avfall av kemiska beredningar	37,4	G
			03.1	Kemiska rester och avlag-ringar	2,2	G
		Total mängd farligt avfall			**47,6**	**F**
		Icke-farligt avfall	07.2	Pappers- och pappavfall	0,0	A
			07.3	Gummiavfall	33,0	A
			07.4	Plastavfall	..	..
			07.5	Träavfall	..	..
			09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	73,1	G
		Total mängd icke-farligt avfall			**172,1**	**E**
	Total mängd Förbränt R1				**219,7**	**E**
	Återvunnet	Icke-farligt avfall	03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier, torrvikt*	..	..
			06.	Metallavfall	8,7	G
			07.1	Glasavfall	..	..
			12.	Mineralavfall (exkl. 12.4 och 12.6)	59,1	E
			12.4	Avfall från förbränning	29,3	A
		Total mängd icke-farligt avfall			**197,2**	**D**
	Total mängd Återvunnet				**197,2**	**D**
	Behandlat Totalt NACE DI				**424,9**	**D**

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Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Metallframställning och metallvarutillverkning						
NACE DJ	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	25,1	E
			02.	Avfall av kemiska beredningar	..	..
			03.1	Kemiska rester och avlag-ringar	..	..
			03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier, torrvikt*	..	..
			12.	Mineralavfall (exkl. 12.4 och 12.6)	..	..
			12.4	Avfall från förbränning	..	..
		Total mängd farligt avfall			**49,5**	**E**
		Icke-farligt avfall	03.2	Avloppsslam från industrier	7,6	F
			03.2	*Avloppsslam från industrier,*	*2,1*	*F*

				torrvikt		
			06.	Metallavfall	..	..
			10.1	Hushållsavfall och liknande avfall	..	..
			10.2	Blandade och ej differentierade material	..	..
			12.	Mineralavfall (exkl. 12.4 och 12.6)	23,0	F
			12.4	Avfall från förbränning	352,3	E
		Total mängd icke-farligt avfall			**393,9**	**D**
	Total mängd Deponerat				**443,4**	
	Förbränt R1	Farligt avfall	01.3	Oljeavfall	1,1	F
		Total mängd farligt avfall			**1,1**	**F**
	Total mängd Förbränt R1				**1,1**	**F**
	Utsläpp & markbehandling	Icke-farligt avfall	03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier, torrvikt*	..	..
		Total mängd icke-farligt avfall			**..**	**..**
	Total mängd Utsläpp & markbehandling				**..**	**..**
	Återvunnet	Farligt avfall	08.	Kasserad utrustning	65,0	F
			08.41	Batterier och ackumulatorer	..	..
			12.4	Avfall från förbränning	..	..
		Total mängd farligt avfall			**138,8**	**E**
		Icke-farligt avfall	03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier, torrvikt*	..	..
			06.	Metallavfall	..	..
			12.	Mineralavfall (exkl. 12.4 och 12.6)	..	..
			12.4	Avfall från förbränning	..	..
		Total mängd icke-farligt avfall			**1 827,0**	**E**
	Total mängd Återvunnet				**1 965,9**	**E**
	Behandlat Totalt NACE DJ				**2 437,0**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

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Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Tillverkning av maskiner, el- och optikprodukter samt transportmedel						
NACE DK+DL+DM	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Icke-farligt avfall	12.	Mineralavfall (exkl. 12.4 och 12.6)	28,3	A
		Total mängd icke-farligt avfall			**28,3**	**A**

	Total mängd Deponerat				**28,3**	**A**
	Återvunnet	Icke-farligt avfall	06.	Metallavfall	99,2	A
		Total mängd icke-farligt avfall			**99,2**	**A**
	Total mängd Återvunnet				**99,2**	**A**
	Behandlat Totalt NACE DK+DL+DM				**127,5**	**A**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

El-, gas-, värme- och vattenförsörjning						
NACE E	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Farligt avfall	12.4	Avfall från förbränning	..	..
		Total mängd farligt avfall			..	..
		Icke-farligt avfall	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,1	G
			12.4	Avfall från förbränning	..	..
		Total mängd icke-farligt avfall			**..**	**..**
	Total mängd Deponerat				**17,3**	**F**
	Förbränt R1	Farligt avfall	01.3	Oljeavfall	0,0	F
			03.1	Kemiska rester och avlagringar	82,7	D
			05.	Sjukvårdsavfall och biologiskt avfall	3,5	E
			07.5	Träavfall	52,4	E
		Total mängd farligt avfall			**138,6**	**D**
		Icke-farligt avfall	03.1	Kemiska rester och avlagringar	..	..
			03.2	Avloppsslam från industrier	42,5	F
			03.2	*Avloppsslam från industrier, torrvikt*	*12,8*	*F*
			05.	Sjukvårdsavfall och biologiskt avfall	..	..
			07.2	Pappers- och pappavfall	11,8	E
			07.3	Gummiavfall	37,0	E
			07.4	Plastavfall	7,1	E
			07.5	Träavfall	5 057,7	C
			09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	3 024,9	D
			09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	22,1	E
			10.1	Hushållsavfall och liknande avfall	2 101,5	C
			10.2	Blandade och ej differentiera-	1 161,4	D

				de material		
			10.3	Sorteringsrester	473,8	E
			11.	Vanligt slam (exkl. 11.3)	0,0	F
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	*0,0*	*F*
			12.	Mineralavfall (exkl. 12.4 och 12.6)	0,2	F
		Total mängd icke-farligt avfall			**11 941,6**	**D**
	Total mängd Förbränt R1				**12 080,2**	**D**
	Utsläpp & markbehandling	Icke-farligt avfall	11.	Vanligt slam (exkl. 11.3)	..	..
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	..	..
		Total mängd icke-farligt avfall			**..**	**..**
	Total mängd Utsläpp & markbehandling				**..**	**..**
	Återvunnet	Icke-farligt avfall	09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	..	..
			11.	Vanligt slam (exkl. 11.3)	..	..
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	..	..
			12.4	Avfall från förbränning	..	..
		Total mängd icke-farligt avfall			**..**	**..**
	Total mängd Återvunnet				**..**	**..**
	Behandlat Totalt NACE E				**12 308,5**	**D**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Byggverksamhet						
NACE F	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Återvunnet	Icke-farligt avfall	12.	Mineralavfall (exkl. 12.4 och 12.6)	6 457,3	F
		Total mängd icke-farligt avfall			**6 457,3**	**F**
	Total mängd Återvunnet				**6 457,3**	**F**
	Behandlat Totalt NACE F				**6 457,3**	**F**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Tjänster (exkl partihandel med avfallsprodukter och skrot samt avloppsrening, avfallshantering, renhållning o.d.)						
NACE G-Q	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Förbränt D10	Farligt avfall	05.	Sjukvårdsavfall och biologiskt avfall	0,2	E
		Total mängd farligt avfall			**0,2**	**E**
		Icke-farligt avfall	05.	Sjukvårdsavfall och biologiskt avfall	0,3	D
			09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	0,5	E
		Total mängd icke-farligt avfall			**0,8**	**D**
	Total mängd Förbränt D10				**0,9**	**D**
	Återvunnet	Icke-farligt avfall	09.11	Animaliskt avfall från bearbetning av livsmedel och matavfall	73,0	E
		Total mängd icke-farligt avfall			**73,0**	**E**
	Total mängd Återvunnet				**73,0**	**E**
	Behandlat Totalt NACE G-Q				**73,9**	**E**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Avloppsrening, avfallshantering, renhållning o.d.						
NACE 90	**Behandling**		**EWCStat**	**Avfallsslag**	**Mängd, 1000 ton**	**Osäkerhet**
	Deponerat	Farligt avfall	01.1	Lösningsmedelsavfall	..	..
			01.2	Surt, alkaliskt eller salthaltigt avfall	6,1	D
			01.3	Oljeavfall	..	..
			02.	Avfall av kemiska beredningar	..	..
			03.1	Kemiska rester och avlagringar	..	..
			03.2	Avloppsslam från industrier	..	..
			03.2	*Avloppsslam från industrier. Torrvikt*	..	..
			07.1	Glasavfall	7,2	D
			07.5	Träavfall	..	..
			08.41	Batterier och ackumulatorer	..	..
			10.2	Blandade och ej differentierade material	3,3	D
			12.	Mineralavfall (exkl. 12.4 och 12.6)	58,7	D
			12.4	Avfall från förbränning	92,0	D
			12.6	Förorenade jord- och muddermassor	122,3	D
		Total mängd farligt avfall			**311,6**	**C**

		Icke-farligt avfall	01.2	Surt, alkaliskt eller salthaltigt avfall	..	..
			02.	Avfall av kemiska beredningar	2,2	D
			03.1	Kemiska rester och avlag-ringar	..	..
			03.2	Avloppsslam från industrier	32,2	E
			03.2	*Avloppsslam från industrier, torrvikt*	*8,8*	*E*
			05.	Sjukvårdsavfall och biologiskt avfall	..	..
			06.	Metallavfall	3,4	D
			07.1	Glasavfall	1,1	D
			07.2	Pappers- och pappavfall	..	..
			07.3	Gummiavfall	..	..
			07.4	Plastavfall	1,3	D
			07.5	Träavfall	..	..
			07.6	Textilavfall	0,2	D
			08.	Kasserad utrustning	..	..
			08.41	Batterier och ackumulatorer	..	..
			09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	9,1	D
			09.11	Animaliskt avfall från bear-betning av livsmedel och matavfall	0,3	D
			09.3	Animalisk faeces, animalisk urin och gödsel	0,4	D
			10.1	Hushållsavfall och liknande avfall	..	..
			10.2	Blandade och ej differentiera-de material	482,0	D
			10.3	Sorteringsrester	311,5	D
			11.	Vanligt slam (exkl. 11.3)	74,1	E
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	*17,5*	*E*
			11.3	Muddermassor	261,1	E
			11.3	*Muddermassor, torrvikt*	*19,6*	*E*
			12.	Mineralavfall (exkl. 12.4 och 12.6)	987,4	D
			12.4	Avfall från förbränning	570,0	D
		Total mängd icke-farligt avfall			**2 990,3**	**C**
	Total mängd Deponerat				**3 301,8**	**C**
NACE 90, forts	**Förbränt D10**	Farligt avfall	01.1	Lösningsmedelsavfall	3,6	B
			01.3	Oljeavfall	0,5	B
			02.	Avfall av kemiska beredningar	17,9	B
			03.1	Kemiska rester och avlag-ringar	46,5	B
			05.	Sjukvårdsavfall och biologiskt avfall	0,2	B
			07.5	Träavfall	1,5	B
			08.	Kasserad utrustning	2,7	B
			10.2	Blandade och ej differentiera-	4,5	B

			de material		
		12.4	Avfall från förbränning	0,0	B
	Total mängd farligt avfall			**77,3**	**A**
	Icke-farligt avfall	05.	Sjukvårdsavfall och biologiskt avfall	0,4	B
		08.41	Batterier och ackumulatorer	0,1	B
	Total mängd icke-farligt avfall			**0,4**	**A**
Total mängd Förbränt D10				**77,7**	**A**
Förbränt R1	Icke-farligt avfall	07.4	Plastavfall	..	..
		10.1	Hushållsavfall och liknande avfall	38,6	B
		10.2	Blandade och ej differentiera-de material	..	..
	Total mängd icke-farligt avfall			44,6	A
Total mängd Förbränt R1				**44,6**	**A**
Utsläpp & markbe-handling	Icke-farligt avfall	03.2	Avloppsslam från industrier	..	..
		03.2	*Avloppsslam från industrier, torrvikt*	..	..
		11.3	Muddermassor	..	..
		11.3	*Muddermassor, torrvikt*	..	..
	Total mängd icke-farligt avfall			**648,8**	**D**
Total mängd Utsläpp & markbehandling				**648,8**	**D**
Återvunnet	Farligt avfall	01.1	Lösningsmedelsavfall	..	..
		03.1	Kemiska rester och avlag-ringar	11,9	D
		12.	Mineralavfall (exkl. 12.4 och 12.6)	33,4	D
		12.4	Avfall från förbränning	..	..
		12.6	Förorenade jord- och mud-dermassor	83,7	D
	Total mängd farligt avfall			**186,7**	**C**
	Icke-farligt avfall	03.1	Kemiska rester och avlag-ringar	..	..
		03.2	Avloppsslam från industrier	17,5	E
		03.2	*Avloppsslam från industrier, torrvikt*	*2,5*	*E*
		07.2	Pappers- och pappavfall	70,6	D
		07.3	Gummiavfall	1,8	D
		07.5	Träavfall	48,1	D
		09.	Animaliskt och vegetabiliskt avfall (exkl. 09.11 och 09.3)	600,7	D
		09.11	Animaliskt avfall från bear-betning av livsmedel och matavfall	58,3	D
		09.3	Animalisk faeces, animalisk urin och gödsel	160,7	D
		10.1	Hushållsavfall och liknande	..	..

				avfall		
			10.2	Blandade och ej differentiera-de material	0,2	D
			10.3	Sorteringsrester	..	..
			11.	Vanligt slam (exkl. 11.3)	579,8	E
			11.	*Vanligt slam (exkl. 11.3), torrvikt*	*97,5*	*E*
			12.	Mineralavfall (exkl. 12.4 och 12.6)	2 284,0	D
			12.4	Avfall från förbränning	148,5	D
		Total mängd icke-farligt avfall			**4 001,7**	**C**
	Total mängd Återvunnet				**4 188,4**	**C**
	Behandlat Totalt NACE 90				**8 261,4**	**C**

Värdet 0,0 anger att avfallstypen förekommer men har avrundats nedåt till 0 (d.v.s. är lägre än 0,5 kton)

".." betyder att värdet är belagt med sekretess

Osäkerhetsbeteckningar: Anger relativ felmarginal för det angivna värdet. Bokstäverna står för följande felmarginaler A: 0 - 2 %; B: 2 - 5 %; C: 5 - 10 %; D: 10 - 20 %; E: 20 - 50 %; F: 50 - 100 %; G: >100 %

Quality Report

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REPORT 5842

SWEDISH EPA
ISBN 978-91-620-5842-5
ISSN 0282-7298

Reporting According to EU Regulation on Waste Statistics 2008.

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