Technical report 65

Waste management facilities

Electronic catalogue

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Contents

Executive summary

The European Topic Centre on Waste is developing a number of electronic catalogues as part of the EEA work programme. A step-by-step procedure was chosen for the development of the catalogue on safe recovery and disposal facilities in EEA member countries. In the first step a questionnaire containing a core dataset about facilities for the treatment of hazardous waste was sent out to the member countries. 17 countries have reported 2 163 companies that are managing 1 836 facilities and 278 landfills for hazardous waste. Data delivered for the UK is considered confidential and is not included in these figures.

Although reporting obligations to the European Commission concerning the requested data have been in force since 1996, much data is missing. While information about location and R/D codes (recovery-disposal codes) is nearly complete, specific data about capacities and available disposal volume of landfills is rare. Information about treated waste types is available from 30 % (landfills) up to 60 % (facilities).

With regard to the completeness of data only the parameter 'R/D codes' was evaluated. Landfilling and typical disposal methods, such as incineration and biological treatment are used more widely than recovery operations. No general system can be observed concerning the structuring of recovery and disposal operations in the individual countries, i.e. each country tends to have its own national system for waste treatment and disposal.

For more information about waste management facilities for hazardous waste a questionnaire for an extended dataset had to be designed. For the extended data two sources were used:
1. The reporting obligations of the EU waste legislation were examined for relevant subjects.
2. Proposals of different involved persons (the Environment DG, national reference centres (NRCs)) have been added.

The result of this survey was combined to produce a proposal for an extended dataset, which was sent out to the NRCs for comment. The return rate for this questionnaire was very low (33 %); another 17 % of NRCs responded by sending general comments. This low return rate and the comments of the NRCs indicate that the member countries are not very interested in an extension of the dataset about facilities for hazardous waste. Furthermore, the results of the questionnaire do not indicate clearly which data should be integrated into the extended dataset.

To provide a view of the availability of data concerning facilities for non-hazardous waste, a questionnaire survey within ETC/W partner countries and regions was carried out. The request included incineration facilities and landfills relevant to the IPPC directive (integrated pollution prevention and control) and was based on the same core dataset used for the hazardous waste facilities. The five partner countries and regions reported 363 companies that are managing 58 incineration facilities and 390 landfills for non-hazardous waste. The data availability in the partner countries for these facilities/landfills is similar to that of the data for facilities/landfills for hazardous waste.

Experiences from the questionnaire request show that data collection even on basic data is very time consuming and takes a lot of effort by the NRCs. Therefore

the core dataset for hazardous waste should be extended very carefully in consultation with NRCs involved.

The further development of the catalogue on waste management facilities should clearly reflect the needs of relevant stakeholders, such as the Environment DG and EEA member countries. Discussions with these stakeholders will be held to clarify the future of the catalogue.

1. Introduction

The main objective of the European Topic Centre on Waste (ETC/W) is to compile and provide objective, reliable, comparable and updated information on waste generation and flow in the member countries of the European Environment Agency (EEA) to support policy-makers and waste managers. Benefits from improved information on the waste sector include the following.

- A firmer basis for waste legislation at European level.
  This includes not only the development of a sustainable community waste strategy and the enacting of a consistent waste legislation, but also improvement in the enforceability of this legislation and a monitoring of the effectiveness of the waste policy. For the monitoring of the implementation of the waste legislation in the Member States reporting obligations were established.
- A firmer basis for waste management planning at national level.
  On the one hand the national authorities of EEA member countries are the sources of data of waste generation and flow on a national level. On the other hand they are in need of relevant information for the planning of their waste management strategies and activities. An improved information system, which harmonises the data collected and processes it into relevant information, is able to meet the needs of member countries.
- Broad dissemination of the collected information to the scientific community, NGOs and the general public.

Despite all efforts in waste prevention and minimisation, the majority of waste still requires treatment and safe disposal facilities. Ensuring that the capacity of those facilities is adequate to handle the quantities of waste generated is an important objective of EU policy. Furthermore, a thorough knowledge about available treatment facilities is a prerequisite for setting realistic and achievable targets for the various waste management options such as material recycling and incineration with energy recovery, taking into account the required time for planning and investment in member countries.

In addition, according to Directive 91/156/EEC, EU Member States shall take appropriate measures to establish an integrated and adequate network of disposal installations thereby enabling the Community as a whole to become self-sufficient in waste disposal. At present, however, availability of data derived from questionnaires for Member States' reports on the implementation of certain directives in the waste sector (Directive 91/692/EEC) is limited.

One of the tasks of the European Topic Centre on Waste (ETC/W), as part of its work programme for the EEA, is to develop a catalogue on safe recovery and disposal facilities in the EEA member countries. This catalogue contains data on type, location and capacity of these facilities, finally aiming at the provision of additional relevant information.

2. Objective

A step-by-step procedure was chosen for the development of the catalogue on safe recovery and disposal facilities in the EEA member countries. First of all a survey on already existing databases and the availability of information on waste management facilities has been conducted. The results of these investigations are documented in the report *Information about waste management facilities in EEA member countries* (EEA Technical report No 43). Based on this report it was decided that in a first step the catalogue will concentrate on hazardous waste treatment facilities and landfills. In a test phase core data has been collected from the ETC/W partner countries and regions. Later on, data has been collected from all EEA member countries. This data has been validated and imported into the catalogue for waste management facilities. This report presents the results of the data request, the delivered data and the data still missing.

During the development of the catalogue and the collection of data a need for further information about waste management facilities was observed. This refers mainly to three subjects:

1. more detailed information on those facilities already imported into the catalogue (extended dataset);
2. information on facilities for recovery and disposal of non-hazardous waste;
3. inclusion of the candidate countries.

1. Extended dataset

The objective of developing an extended dataset is to obtain more relevant information about waste management facilities. The selection of additional data has to address the needs of the future users of the catalogue. As mentioned in the introduction main target groups of this information system are the European Commission and the national authorities. Thus, the extended dataset will be developed in close contact with the Environment DG and the national NRCs as representatives of these target groups. This report has the purpose of proposing a dataset for the additional information on waste management facilities for hazardous waste, taking into account the availability of data, and of prioritising the data requests.

Moreover, the data collection can be used as a tool for fulfilment of the reporting obligations of EU waste legislation in cases concerning waste management facilities. Similar to the development of the core dataset, where the reporting obligations based on Article 8(3) of Directive 91/689/EEC on hazardous waste were integrated, EU waste legislation should be examined for relevant items.

2. Facilities for non-hazardous waste

To obtain information about the availability of data on waste management facilities for non-hazardous waste a questionnaire survey was carried out in the ETC/W partner countries and regions. The survey was restricted to IPPC-relevant incineration facilities and landfills for municipal and other non-hazardous waste (no inert waste) and was carried out with a core dataset identical with the one for facilities for hazardous waste. The present report presents the results of this survey as well as the deriving conclusions for a general extension of the catalogue to all EEA member countries and all facilities for non-hazardous waste.

3. Accession countries

In the year 2001 a number of accession countries are expected to become members of the EEA. The membership of the EEA is connected with the

establishment of a data network, also for waste issues. In the accession countries the state of approximation to the waste legislation of the EU is very different. Therefore, basic requirements have to be set up. The first action will be to nominate a contact person in each country related to the work of the European Topic Centre on Waste.

In summary, the objectives of this report are:

- to present the core data on recovery and disposal facilities for hazardous waste that have been reported by EEA member countries;
- to show the data gaps concerning these facilities;
- to present the core data on incineration facilities and landfills, delivered by the ETC/W partner countries or regions;
- to give recommendations on the extension of the dataset referring to facilities for non-hazardous waste in all EEA member countries to an extension of the dataset and to the inclusion of candidate and accession countries;
- to plan activities for the further development of the data collection for the catalogue for waste management facilities.

3. Delivered core data on waste management facilities for hazardous waste

3.1. Data request (questionnaire)

The questionnaire was designed on the basis of the 'format in which information is to be provided pursuant to Article 8(3) of Council Directive 91/689/EEC on hazardous waste' (Commission Decision 96/302/EC).

Data from EEA member countries were requested in the form of four Excel sheets explained in the following:

- companies file: SSCOM001
- facilities file: SSFAC001
- landfills file: SSLAN001
- annual waste file: SSANN001

SS in this context indicates the two-digit country code:

AT	Austria	BE	Belgium	DK	Denmark
FI	Finland	FR	France	DE	Germany
GR	Greece	IE	Ireland	IT	Italy
LU	Luxembourg	NL	The Netherlands	PT	Portugal
ES	Spain	SE	Sweden	GB	United Kingdom
IS	Iceland	LI	Liechtenstein	NO	Norway

3.1.1. Companies file

Data on companies running one or more recovery or disposal facilities were requested. Companies only collecting or transporting hazardous waste were not included. In cases where the owner and the operator of the facilities are not identical, the company, which is legally responsible, has to be entered into the questionnaire. The core dataset comprises basic information about location and type of the companies (see Table 3.1).

Table 3.1: Information requested in the companies file

Column headline	Description of the information requested	Example
Company No	An ID number for each company	1
Name	The name of the company	Abfall Entsorgung GmbH
Zip code and city	The postal code and the name of the city, where the company is located	1010 Wien
Address	The street name and the building number or any other name of the location of the company	Mozartstrasse 1
NUTS code level 3	The NUTS code at level 3 in the format SSXXX	AT126
Company type	private, public or semi-public	private

3.1.2. Facilities file

The requests for data on landfills and on all other waste management facilities were divided into separate files, because capacities are indicated with different units (square metres for landfills, tonnes for all other facilities). The data requested in the facilities file is listed up in the following Table 3.2.

Table 3.2: Information requested in the facilities file

Column headline	Description of the information requested	Example
Facility No	An ID number for each facility	1
R/D code(s) and capacity in tonnes per year (t/a)	The R/D classes and, where available, the associated annual capacities according to a permit	R1\100 R9\50
Company No	This number must correspond to the ID number of the company according to the companies file	1
Zip code and city	The postal code and the city name separated by a blank	1010 Wien
Address	The street name and the building number or any other name of the location	Mozartstrasse 1
NUTS code level 3	The NUTS code at level 3 in the format SSXXX	AT126
Total capacity in tonnes per year	The total annual quantity (tonnes) allowed under the facility licence/permit	150
In operation since	The date when the facility was put into operation	19990131
Comment	Any additional information on the facility	
Waste type(s) and capacity in tonnes per year (t/a)	The waste type(s) allowed to be treated at the facility according to the European Waste Catalogue (six-digit EWC code) and, where available, the quantities of each waste type in tonnes per year (t/a).	030201\10 070101\50 ([1])

3.1.3. Landfills file

The data requested about landfills is identical with those for facilities despite of the different units for the capacities (see Table 3.3).

Table 3.3: Information requested in the landfills file

Column headline	Description of the information requested	Example
Landfill No	An ID number for each landfill	1
D-code(s) and disposal volume in m³	The appropriate D-code(s) of the landfill (D1 and/or D5) and, where available, totally allowed disposal volume in m³	D1\100000 D5\50000
Company No	This number must correspond to the ID-number of the company according to the companies file	1
Zip code and city	The postal code and the city name separated by a blank	1010 Wien
Address	The street name and the building number or any other name of the location	Mozartstrasse 1
NUTS code level 3	The NUTS code at level 3 in the format SSXXX	AT126
Total disposal volume in m³	The total disposal volume in m³ of the landfill allowed under the landfill license/permit	150000
In operation since	The date when the landfill was put into operation in the format YYMMDD	19990128
Comment	Any additional information on the landfill	Hazardous waste
Waste types and capacity in tonnes/year	The waste types allowed to be disposed of at the landfill according to the European Waste Catalogue and, where available, the quantity of each waste type in tonnes per year (t/a).	050103\10 070109\50[2]

3.1.4. Annual waste file

Additional information about landfills was requested, the 'available disposal volume' (see Table 3.4). This data request is located in a separate file, because this information has to be updated every year. Other information about landfills, which was requested in the landfills file, has to be updated only in case of relevant changes.

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[1] ( ) Waste codes and the corresponding quantity are separated with a backslash (\). Different waste codes are separated with a blank.

Table 3.4: Information requested in the annual waste file

Column headline	Description of the information requested	Example
Landfill No	The number of the landfill according to the landfills file	1
Zip code and city	The postal code and the city name separated by a blank	1010 Wien
D-code (D1 or D5)	The appropriate D-code(s) of the landfill (D1 and/or D5)	D1
Available disposal volume in m³	The free (available) disposal volume in m³ at a certain date (key date) should be given	48000
Keydate	The corresponding year in the format YY	1997

3.2. Data in the catalogue

3.2.1. Responses to the questionnaire

The questionnaire was sent out via e-mail on 20 April 1999. The first countries delivered basic data in June 1999, the last ones in October 2000. In the meantime two countries (Finland and Greece) had already updated their dataset.

Belgium did not send data for the whole country, but individually for the regions Flanders and Wallonia. For the region of Brussels no data was delivered.

Sweden has until now delivered data only about companies. Data about facilities and landfills will be delivered later.

France has not yet reported facilities for material recovery of hazardous waste.

3.2.2. Confidentiality of data

Only a minority of the data delivered is regarded confidential by the national authorities and is therefore not stored in the catalogue or included in this report. The data in question is:

- Italy: addresses of operator companies
- The Netherlands: capacity of treated waste types.

The UK has sent data about more than 1 000 facilities but did not want this data to be published in the catalogue. Therefore this data could not be included in this report.

3.2.3. Overview of reported core data

All data delivered was validated and, if necessary, revised in cooperation with the national reference centres for waste (NRCs). Nevertheless, it was not possible to import all data into the catalogue because of software reasons (lack of key code data). In this report all delivered data free for publication has been included. Therefore the numbers of companies, facilities and landfills in this report are in some cases higher than the numbers in the catalogue. The work to solve the software problems and import the missing data into the catalogue is still going on.

An overview of the reported companies, facilities and landfills is shown in Table 3.5. The column 'Locations altogether' contains the total sum of facilities and landfills of a country.

Table 3.5: Number of reported companies, facilities and landfills

Country	Companies	Facilities	Landfills	Locations altogether	Date of data delivery
Austria (AT)	102	129	0	129	July 1999
Belgium (BE)*	60	70	9	79	August 1999
Germany (DE)	579	582	171	753	July 1999
Denmark (DK)	62	50	13	63	July 1999
Spain (ES)	217	209	10	219	June 1999
Finland (FI)	77	83	9	92	Oct. 2000 (1st update)
France (GB)	99	89	14	103	Oct. 2000
Greece (GR)	13	13	0	13	Oct. 2000 (1st update)
Ireland (IE)	12	12	0	12	July 1999
Iceland (IS)	1	1	0	1	July 1999
Italy (IT)	458	449	39	488	Dec. 1999
Liechtenstein (LI)	3	3	0	3	Dec. 1999
Luxembourg (LU)	3	3	0	3	Nov. 1999
The Netherlands (NL)	305	99	11	110	Nov. 1999
Norway (NO)	34	37	1	38	August 1999
Portugal (PT)	7	7	1	8	August 1999
Sweden (SE)	131	n.d.	n.d.	n.d.	Oct. 2000
All countries	2 163	1 836	278	2 114	

* Only Belgium Flanders and Wallonia
n.d.: no data available at the moment

17 EEA member countries reported 2 163 companies which are managing facilities or landfills for the treatment of hazardous waste. In most countries there are companies which manage more than one waste treatment facility or landfill. In these cases the number of locations is higher than the number of companies.

There is one country (the Netherlands), where the number of companies is higher than the number of locations. The reason for this discrepancy is that the Dutch waste facilities database contains all companies dealing with hazardous waste, including those for collection and transport. It was not possible to sort out only the companies managing waste treatment facilities.

In total, 2 114 locations were reported by 16 EEA member countries. Germany and Italy are by far the two countries with the highest numbers of locations. Other countries such as Iceland, Liechtenstein and Luxembourg reported only very few facilities. The reason is that these are small countries with only a small amount of hazardous waste, which is treated in neighbouring countries. The disposal system of Liechtenstein is, for example, integrated in the Swiss disposal system. Luxembourg is disposing a high percentage of its hazardous waste in France, Belgium and Germany.

In six countries (Austria, Greece, Ireland, Iceland, Liechtenstein and Luxembourg) there are no landfills for the disposal of hazardous waste.

3.2.4. Completeness of datasets

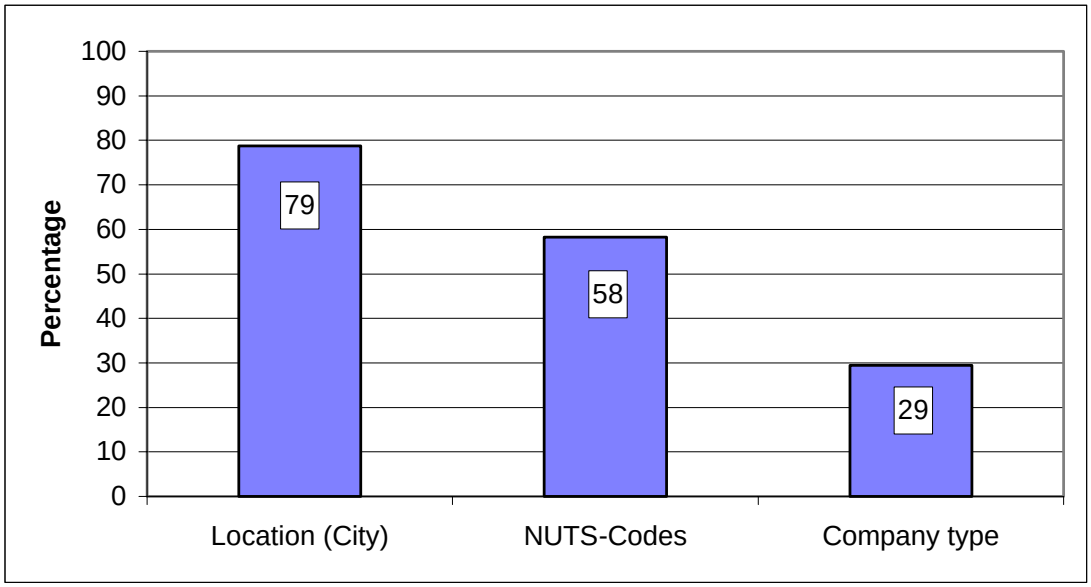
The information requested in this questionnaire is identical to reporting obligations to the European Commission according to Commission Decision 96/302/EC. Although these reporting obligations have been in force since 1996 and therefore the data concerned should be available, much data is still missing.

To give an overall view of the completeness of the data requested, the percentage of delivered data of a specific parameter in relation to the number of delivered companies, facilities or landfills was calculated. The detailed information about all parameters and all countries can be found in Annex 1.

For the companies the parameters location, NUTS code and company type have been investigated. As there is much data about the location of a company (zip code, city and address), for this purpose the availability of data about the city is considered. The result of this evaluation is presented in Diagram 3.1.

While the reporting percentage for data about location of a company is relatively high, information about company type is very scarce. The reason is that the countries with the highest number of companies (Germany, Italy, the Netherlands and Spain) have delivered only very few data about that parameter.

Diagram 3.1: Completeness of company data

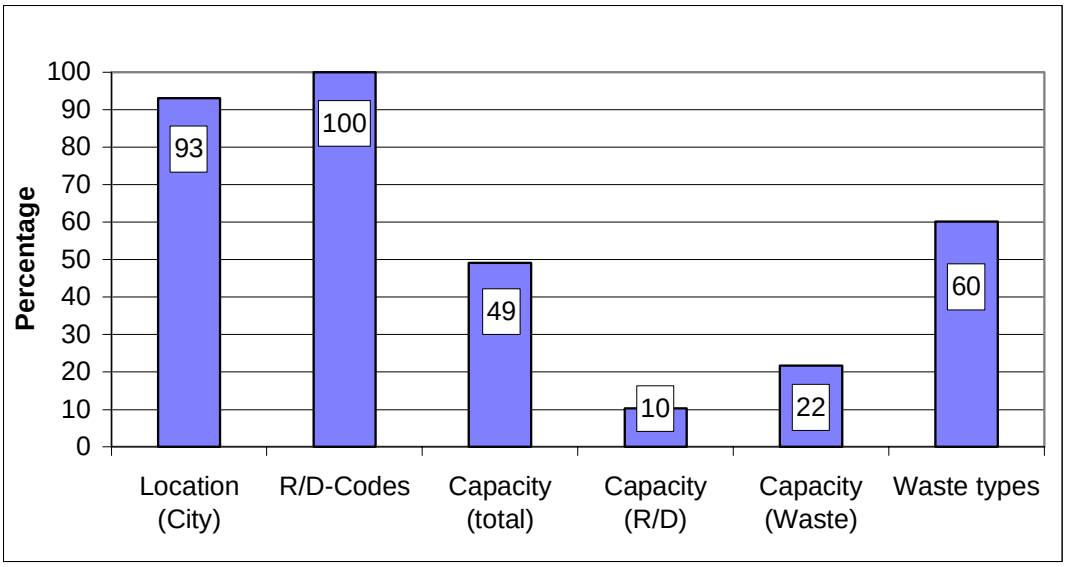


Concerning the completeness of facility data the following parameters were investigated:

- location (completeness of data about the city);
- R/D codes;
- capacity: total capacity as well as the capacities referring to R/D code and referring to the waste types;
- treated waste types.

The results of this investigation are shown in Diagram 3.2.

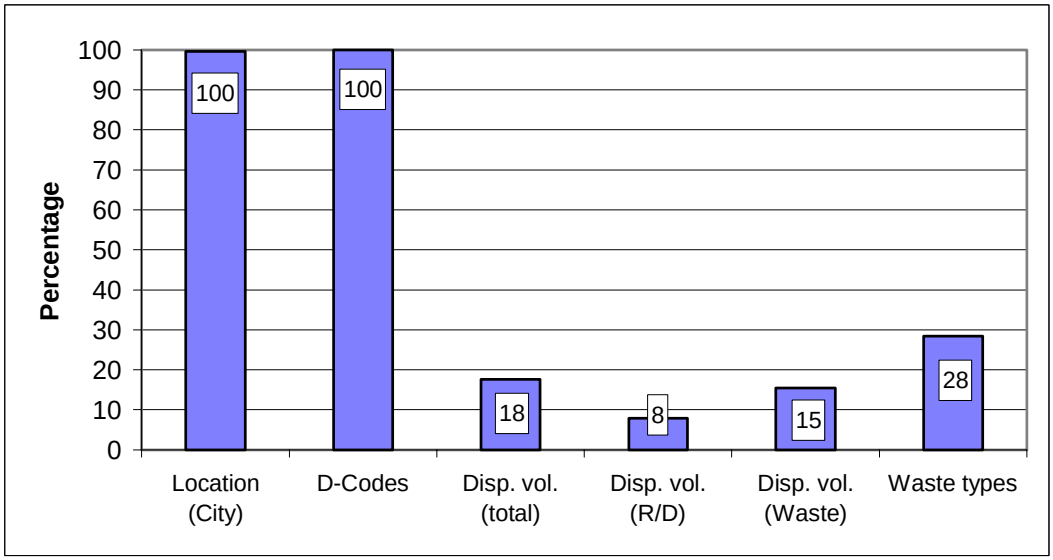
Diagram 3.2: Completeness of facility data



Concerning facilities, data about R/D codes is complete and data about the location is available to a very high percentage. While at least half of the data about total capacity is available, specific information about the capacities referring to R/D codes and to waste types is very poor. In comparison, data about waste types is at the same level as data about total capacity. However, it has to be taken into consideration that an essential part of the waste types are delivered only in two-digit code.

The parameters examined for completeness of landfill data are similar to the parameter set for the completeness of facility data, only capacity is substituted by disposal volume and the R/D codes D1 and D5 are relevant. The results are shown in Diagram 3.3.

Diagram 3.3: Completeness of landfill data



Data about location and D-codes for landfills is even 100 % complete. The other parameters have a similar distribution as the data for facilities, however, the percentage of completeness for landfills is much lower.

A specific parameter for landfills, which is not shown in the diagram, is the disposal volume available (rest capacity). This parameter has also a very low rate of data delivery (17 %). Potential reasons for the lack of data are described in the following.

The collection of specific data on waste management facilities is very time consuming and takes a lot of effort. The national contact persons, the national reference centres (NRCs), have in most cases several functions and have therefore only limited time for their work as a NRC. As there are numerous requests and as this questionnaire request is not mandatory, there is not enough time for completion of all questionnaires. The solution to this problem could be that the referring reporting obligations according to Commission Decision 96/302/EC can be fulfilled by filling in the questionnaire of the ETC/W. This solution has to be agreed by the European Commission (the Environment DG) and the national authorities as well.

Even in the case that the requested data is available in principle, the catalogue can only work with them in a special electronic format. It takes a lot of time and effort to transform the data from a national format into one that can be imported into the catalogue.

Moreover, there are also EEA member countries, which simply do not yet have the requested information, because they do not use the common codes. Especially those EEA member countries which are not EU Member States (e.g. Liechtenstein) are not obliged to use R/D or EWC codes. Other Member States, e.g. Austria and the UK, have not yet introduced the EWC code completely.

3.2.5. Evaluation of R/D codes

Overview

The only parameter, for which an evaluation makes sense with regard to the completeness of data, is the parameter R/D codes. There is only one out of 2 114 locations, for which no R/D code was reported.

With the evaluation of the R/D codes it is possible to give information about the kind and number of operations that are used in the individual countries for the treatment of hazardous waste. However, the validity of this evaluation is limited the following reasons.

- The data gives only information about the number of R/D operations and not the capacity referring to these operations. Therefore, it is not possible to obtain a realistic image of the proportion every R/D codes holds within the waste treatment system of a country.
- Nearly a third of the facilities and landfills (31 %) were reported with more than one R/D code. Hence it is not always possible to compare complete facilities, but in many cases only parts of facilities.

For these reasons the evaluation of R/D codes indicates only a trend of the recovery and disposal structure of the countries.

Tables 3.6 and 3.7 show the number of R-codes and D-codes respectively that were reported for the landfills (D1 and D5) and facilities (all other R/D codes).

Table 3.6: Number of R-Codes, classified according to single R-codes and States

State	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	Σ
AT	8	2	26	50	14	4	0	3	0	0	2	0	0	*109*
BE	12	5	7	15	13	1	1	0	3	0	0	3	4	*64*
DE	16	21	38	48	33	2	2	1	16	2	2	5	47	*233*
DK	4	0	3	8	3	1	1	0	19	0	0	42	0	*81*
ES	23	11	13	39	7	0	1	1	8	0	1	1	49	*154*
FI	6	3	1	10	3	0	0	0	7	4	0	1	7	*42*
FR	54	27	0	0	0	0	0	0	0	0	0	0	0	*81*
GR	0	3	0	0	0	0	0	5	0	0	0	0	0	*8*
IE	2	2	5	4	0	1	0	4	0	0	0	0	*6*	*24*
IS	1	0	0	0	0	0	0	0	0	0	0	0	0	*1*
LI	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*
LU	0	0	0	1	0	0	0	0	0	0	0	0	1	*2*
NL	1	8	12	25	17	0	1	2	37	0	4	0	0	*107*
NO	2	11	2	1	1	0	0	2	13	0	0	1	0	*33*
PT	0	1	0	0	0	0	0	0	2	0	0	0	5	*8*
all States	*129*	*94*	*107*	*201*	*91*	*9*	*6*	*18*	*105*	*6*	*9*	*53*	*119*	*947*

In Italy there are 221 facilities for material recovery of hazardous waste, however, an assignment to individual R-codes is not possible. Therefore the Italian R-codes are omitted from this table.

Table 3.7: Number of D-codes, classified according to single D-codes and States

State	D1	D2	D4	D5	D8	D9	D10	D12	D13	D14	D15	Σ
AT	0	9	1	0	8	65	11	0	0	16	1	*111*
BE	5	3	1	4	5	8	5	0	2	2	6	*41*
DE	165	5	0	5	57	249	79	3	17	13	95	*688*
DK	12	0	0	1	1	4	0	0	0	0	0	*18*
ES	1	0	0	9	2	44	8	1	9	5	54	*133*
FI	2	1	2	7	15	33	4	0	11	5	15	*95*
FR	0	0	0	14	0	16	0	0	0	0	0	*30*
GR	0	0	0	0	0	0	0	0	0	6	0	*6*
IE	0	0	1	0	1	4	0	0	3	3	6	*18*
IS	0	0	0	0	0	0	0	0	0	0	0	*0*
IT	0	0	0	39	74	147	46	0	0	0	0	*306*
LI	0	0	0	0	0	3	0	0	0	0	0	*3*
LU	0	0	0	0	0	1	0	0	0	0	1	*2*
NL	0	0	0	11	7	30	6	0	2	0	0	*56*
NO	0	0	0	1	0	4	4	0	0	0	0	*9*
PT	1	0	0	0	0	2	0	0	0	2	2	*7*
all states	*186*	*18*	*5*	*91*	*170*	*610*	*163*	*4*	*44*	*52*	*180*	*1 523*

Concerning disposal as well as recovery operations Germany and Italy report the highest numbers of R/D codes. But it has to be taken into consideration that the UK data with more than 1 000 facilities and landfills are missing.

Concerning the structure of the recovery and disposal operations no obvious general system can be observed in the individual countries. Some countries have a broad coverage of R/D codes, while others rely more on selected operations. In general, it can be noted that the more R/D codes reported the broader the coverage of operations.

Comparison of R/D codes
Table 3.8 shows the list of R/D operations that are used for the recovery and disposal of hazardous wastes, sorted by relevance. R/D operations that were reported below a number of 10 were omitted from the table.

The most common operation for the treatment of hazardous waste is the physico-chemical treatment (D9). This operation is in most cases used for the pre-treatment of waste. Products of this process are often treated in further operations. A good example is the splitting up of emulsions into water and oil by physico chemical methods. Afterwards the oil is burned in an incineration facility, while the water can be discharged into a water body. Physico-chemical treatment is a widespread operation in nearly all EEA member countries.

Other relevant disposal operations are the biological treatment (D8) and the incineration of hazardous waste on land (D10). Both are typical disposal methods which are thoroughly tested in many countries. The main parts of all three disposal operations mentioned (D8, D9, D10) are reported from Germany and Italy.

Table 3.8: Order of reported R/D codes

Spectrum	No of codes	Code	Operation
> 210	610	D9	Physico-chemical treatment
150 – 210	201	R4	Recycling/reclamation of metals
	186	D1	Deposit into or onto land
	180	D15	Storage
	170	D8	Biological treatment
	163	D10	Incineration on land
90–150	129	R1	Use principally as a fuel or other means to generate energy
	119	R13	Storage of waste
	107	R3	Recycling/reclamation of organic substances (no solvents)
	105	R9	Oil re-refining or other reuses of oil
	94	R2	Solvent reclamation/regeneration
	91	D5	Specially engineered landfill
	91	R5	Recycling/reclamation of other inorganic materials
<90	53	R12	Exchange of wastes
	52	D14	Repackaging
	44	D13	Blending or mixing
	18	R8	Recovery of components from catalysts
	18	D2	Land treatment

Landfilling (D1, D5) is also a very common method for the disposal of hazardous waste. While landfilling with code D1 is reported primarily from Germany (90 %), D5 landfilling is concentrated in a number of countries.

The most used recovery operation is the recycling/reclamation of metals (R4). This operation method is well-tried in many EEA member countries. All other recovery operations are reported more rarely.

All in all it can be said that landfilling and the classic disposal methods (incineration and physico-chemical as well as biological treatment) are used much more often for the treatment of hazardous waste than recovery operations. This can also be proved by the total sum of disposal operations compared with recovery operations.

4. Extended dataset

4.1. Legislation and obligations to report

A systematic approach to composing the questionnaire is to have a close look at the reporting obligations required by EU waste legislation. Only the reporting obligations referring to waste management facilities are of interest. The following list comprises the relevant directives in this sector:

- directive on hazardous waste;
- directive on waste;
- directive on the landfill of waste;
- directive on the incineration of hazardous waste;
- IPPC directive;
- directive on the protection of groundwater.

The waste statistics regulation was in an early stage when this questionnaire was sent out, and therefore its relevant reporting obligations are not considered in this report. In general the data request deriving from reporting obligations to the European Commission will further increase in the future and therefore the extension and updating of the catalogue is an ongoing process.

The results of this survey have to be harmonised with the demands of the Environment DG and the NRCs of the EEA member countries.

For some directives, questionnaires for reporting obligations have been designed. However, not all items of these questionnaires concerning waste management facilities can be inserted directly into the extended dataset. Items which cannot be processed in a database, e.g. descriptive texts, have to be omitted.

4.1.1. Directive on hazardous waste

For the reporting obligations of the directive on hazardous waste a questionnaire was designed (Commission Decision 96/302/EC). This questionnaire gives information on the name, address, telephone and fax number, capacity, treatment method (R/D codes) and type of wastes (EWC/HWL – European Waste Catalogue/Hazardous Waste List) for recovery and disposal facilities for hazardous waste and has to be filled in with yearly updated information and sent to the Commission. To meet these reporting obligations, a core dataset was compiled and built up in the catalogue. The core dataset consists of the data listed in Table 4.1 on the following page.

In comparison with the requirements of the directive on hazardous waste only the telephone number and the fax number of the facilities or landfills is still missing in the dataset. This data has to be included into the extended dataset. Further information about the facilities, landfills and companies going beyond the reporting obligations of this directive could be of interest:

- NACE code
- contact person
- URL (homepage of the company)
- e-mail address.

Table 4.1: Core dataset of the catalogue on waste management facilities

Core data	Description of the core data
Company No	An ID-number for each company
Name	The name of the company
Zip code and city (company)	The postal code and the name of the city, where the company is located
Address (company)	The street name and the building number or any other name of the location of the company
NUTS code level 3	The NUTS code at level 3 of the city, where the company is located
Company type	One of the types private, public' or semipublic can be chosen
Facility No	An ID number for each facility
Landfill No	An ID number for each landfill
R/D code(s) and capacity in t/a	The R/D classes and, where available, the associated annual capacities of a facility
D-code(s) and disposal volume in m^3	The appropriate D-code(s) of the landfill (D1 and/or D5) and, where available, totally allowed disposal volume in m^3
Total capacity in t/a	The total annual quantity allowed under the facility licence/permit
Total disposal volume in m^3	The total disposal volume in m^3 of the landfill allowed under the landfill license/permit
Zip code and city (facility or landfill)	The postal code and the city name of the city, where the facility or landfill is located
Address	The street name and the building number or any other name of the facility or landfill location
NUTS code level 3	The NUTS code at level 3 of the city, where the facility or landfill is located
In operation since	The date when the facility or landfill came into operation
Waste type(s) and capacity in t/a	The waste type(s) allowed at the facility or to be disposed of at the landfill according to the European Waste Catalogue in the form of the six-digit EWC code and the corresponding quantity
Available disposal volume in m^3	The free (available) disposal volume of a landfill in m^3 at a certain date (key date)

4.1.2. Directive on waste

According to the Council Directive 75/442/EEC of 15 July 1975 on waste amended in Council Directive 91/156/EEC of 18 March 1991 there is a reporting obligation on numerous data on waste management. Undertakings transporting, collecting, storing, tipping or treating their own waste and those collecting or transporting waste on behalf of third parties shall be subject to supervision by the competent authority referred to in Article 6.

The information of relevance to the extended dataset asked for in the corresponding questionnaire (Commission Decision 94/741/EC concerning questionnaires for Member States reports on the implementation of certain directives in the waste sector) is as follows:

- number of competent authorities in each of the NUTS levels;
- waste management plans;
- actual or estimated figures for the waste produced and disposed of within the Member State (MS), out of the total waste produced in the MS requiring disposal
  Total waste produced within the MS, of which:
  — recycled (within and outside the MS);
  — incinerated (within and outside the MS);
  — incinerated with energy recovery (within and outside the MS);
  — landfilled (within and outside the MS);
  — others, please specify (within and outside the MS).
- degree of self-sufficiency in waste disposal that has been attained in the MS.

The information about waste streams can be derived from the core dataset, in which R/D codes and treated waste types of the facilities are requested.

A list of the competent authorities as well as a list of the existing waste management plans is prepared simultaneously by other working groups of the topic centre. Additionally, relevant electronic questionnaires, which can be used by the Member States for reporting obligations, are prepared. The results of all working groups will be combined in a common database (WasteBase).

4.1.3. Directive on the landfill of waste

Council Directive 99/31/EC of 26 April 1999 on the landfill of waste, which provides obligations to report in intervals of three years, recently came into force. Therefore, only a draft questionnaire has been developed until now. Although major changes of the questionnaire are possible, it can be used as a basis for the future data requests on landfills. Questions concerning landfills which are of interest to the extended dataset and which are not yet part of the core dataset are listed below:

- quantity of biodegradable waste (in t, broken down in waste streams) going to landfills for each year of the reporting period;
- information about excluded landfills according to Article 3;
- existing landfills for hazardous waste: complying with directive, re-equipped;
- existing landfills for non-hazardous waste: total number, complying with directive, closed/to be closed, re-equipped, rest capacity;
- existing landfills for inert waste: total number, complying with directive, closed/to be closed, re-equipped, rest capacity;
- average landfill prices and charges/taxes in relation to the classes of landfills;
- collection and treatment of landfill gas.

The number of landfills for hazardous waste as well as their rest capacity and their activity is already included in the core dataset.

4.1.4. Directive on incineration of hazardous waste

The reporting obligation according to Council Directive 94/67/EC of 16 December 1994 on the incineration of hazardous waste can be seen as a completion of information about hazardous waste. The objective of this directive is to reduce the negative environmental impact from hazardous waste incineration. Information requested according to the questionnaire published under the Commission Decision 98/184/EEC of 25 February 1998 and which is relevant for the extended dataset is listed below:

- the number of permits issued in accordance with Article 3(1) and the associated operating capacities;
- the number of permits and the authorised total volume of waste co-incinerated in accordance with Article 3(3);
- source of the waste incinerated (own waste at the place of production, waste of third parties);
- air emission limit values;
- pre-treatment and subsequent recovery or disposal of residues resulting from the operation of the incineration plant;
- the type of recovery and the efficiencies, if heat produced by incineration is recovered.

4.1.5. Council directive concerning integrated pollution prevention and control (IPPC)

The purpose of IPPC Directive 96/61/EC is to achieve integrated prevention and control of pollution arising from activities that are summarised in Annex 1 to the IPPC directive. The activity 'waste management' comprises the following installations:

- installations for the disposal or recovery of hazardous waste as defined in the list referred to in Article 1(4) of Directive 91/689/EEC, as defined in Annexes II A and II B (operations R1, R5, R6, R8 and R9), to Directive 75/442/EEC and in Council Directive 75/439/EEC of 16 June 1975 on the disposal of waste oils (3), with a capacity exceeding 10 tonnes per day;
- installations for the incineration of municipal waste as defined in Council Directive 89/369/EEC of 8 June 1989 on the prevention of air pollution from new municipal waste incineration plants (4) and Council Directive 89/429/EEC of 21 June 1989 on the reduction of air pollution from existing municipal waste incineration plants (5) with a capacity exceeding 3 tonnes per hour;
- Installations for the disposal of non-hazardous waste as defined in Annex II A to Directive 75/442/EEC under headings D8 and D9, with a capacity exceeding 50 tonnes per day.
- Landfills receiving more than 10 tonnes per day or with a total capacity exceeding 25 000 tonnes, excluding landfills of inert waste.

The IPPC directive provides access to information about the installations on two levels.

1. The Member States have to supply the Commission with an inventory of principal emissions and the sources responsible.
2. The public in general has to be informed about the permit of the installation and any subsequent updates. The permit includes a lot of information with environmental relevance:
    - details of the arrangements made for air, water and land protection;
    - emission limit values for pollutants (in particular, those of Annex III); where appropriate limit values may be supplemented or replaced by equivalent parameters or technical measures;
    - if necessary, appropriate requirements ensuring protection of soil and groundwater;
    - if necessary, measures concerning the waste generated by the application;
    - monitoring of releases as required under permit conditions and held by the competent authority.

This obligation to provide public access to information is basically not a reporting obligation to the Commission. Nevertheless, the information has to be provided by the competent authorities and is a valuable contribution to the extended dataset.

4.1.6. Directive on the protection of groundwater

The purpose of the Council directive of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances (Directive 80/68/EEC) is to prevent the pollution of groundwater by substances belonging to the families and groups of substances in lists I or II in its annex. The directive contains regulations about direct and indirect discharge of those substances into the groundwater. According to the Commission decision of 27 July 1992 concerning questionnaires relating to directives in the water sector (Directive 92/446/EEC) some information has to be reported to the Commission over a three-year period. The information of relevance to an extended dataset is:

- a list of disposal and tipping sites which are currently recorded on the inventory of authorisations required by Article 15 (authorisations of discharges of substances in list I) indicating their geographical locations and date of authorisation;
- the number of applications for waste disposal or tipping authorisations for the purposes of disposing material which might lead to an indirect discharge of a list II substance or substances.

This directive is the only one that requests the geographical location of waste management facilities. With its help the catalogue could be completed on this sector. Another piece of information, which could be taken into consideration, is the authorisation of discharge of certain substances into the groundwater.

4.1.7. Possible extensions according to first comments

During presentation of the catalogue, a number of possible extensions to the dataset have been proposed. The following proposals came from the Environment DG, the EEA member countries (NRCs) as well as from concerned units of other DGs.

The **competent authority** is requested not only in various directives but also from some member countries, for example, to contact the competent authority in the case of transboundary shipment of waste. In this regard, especially the address, telephone number, fax number and contact person for waste management is important. To supply this information a link to the catalogue of competent authorities created by the ETC/W could be established.

Some countries wanted to have an additional possibility to comment on the capacity. Principally the capacity has to be reported in tonnes per year (t/a). In some cases only data in kg/h or t/d is available, which could not be converted into t/a with the available information. In these cases it would be useful to have a comment field, where the capacity in different units can be reported, so the reader gets at least an idea about the scale of the capacity.

The landfill directive provides the possibility to set up general **criteria lists** for waste to be accepted or refused at the different landfill classes. Other facilities may have individual acceptance criteria, which could also be included into the catalogue.

The **total area of landfills** is useful for determining the environmental burden (land use) of this kind of disposal. This might be useful for lifecycle analysis.

Many countries delivered their data in **eight-digit waste codes** as a contribution to the national legislation. This gave us the impetus to consider the future import of national eight-digit waste codes. Anyhow, the catalogue has to be adapted in this aspect, as the EWC code will change again.

As far as the directive on incineration of waste is merely a preparatory act, the information requested on incineration facilities is reduced to the facilities treating hazardous wastes. More **detailed information on the incineration of wastes**, such as emission values, monitoring of emission into air and water, treatment of residues, should be requested by an extended dataset.

Other possible extensions are:
- basic waste streams (input, output) of a facility;

- import and export of waste;
- contribution of waste management facilities to climate change.

4.2. Questionnaire request

4.2.1. Questionnaire

The result of the examination of EU legislation for reporting obligations concerning waste management facilities as well as the personal proposals for additional data have been compiled in a table. The data was described briefly and divided into five thematical groups. This questionnaire, which can be found in Annex 2, was sent out to the NRCs with two requests:

- priority of data: the NRCs were asked to mark the priority of each dataset with a number from one (low priority) to three (high priority);
- availability of data: The availability of data should be indicated with 'Y' for yes and 'N' for no. In most cases the NRCs added other information like 'data partly available' or 'data will be available later'.

Furthermore, the NRCs were invited to add their own proposals for data to be integrated into the extended dataset.

4.2.2. Results of the questionnaire request

The return rate of this questionnaire request was very low. Only 6 out of 18 NRCs filled in the questionnaire. In addition, 3 NRCs responded by commenting on the extension of the catalogue in general without filling in the questionnaire (Germany, the Netherlands, and Sweden). This gives a return rate for the questionnaire of only 33 % and a return rate including comments of 50 %.

To get an overall view of the priorities set by the NRCs, the delivered ranking numbers were processed to provide an arithmetical mean and sorted in descending order. Furthermore, the percentage of data availability over all responding countries was calculated. For this calculation data reported as partly available or later available, was classified as 'available'. The results of this calculation are presented in Table 4.2, while the detailed answers to the questionnaire are summarised in Annex 3.

Table 4.2: Information about priority and availability of data for the extended dataset, delivered by NRCs of 6 EEA member countries

Requested information	Arithmetical mean	Percentage availability
Number of landfills (LF)	2.83	86
Operating capacity of incineration plant (IHW)	2.67	100
Input of wastes (PP)	2.67	57
Output of wastes (PP)	2.67	43
Landfills complying with directive (LF)	2.33	71
Landfills closed/to be closed (LF)	2.33	57
Rest capacity of landfills (LF)	2.33	43
Comment to the capacity (unit) (PP)	2.25	43
Emissions concerning air (IPPC)	2.20	57
Emissions concerning water (IPPC)	2.20	57
Quantity of biodegradable waste (LF)	2.17	57
Average landfill prices (LF)	2.17	43
Charges/taxes for landfilling (LF)	2.17	86
Treatment of incineration residues from hazardous waste (IHW)	2.17	57
Treatment of incineration residues from non-hazardous waste (IHW)	2.17	57
Import of waste (PP)	2.17	86
Export of waste (PP)	2.17	100
Acceptance criteria for wastes (PP)	2.08	43
Information about excluded landfills according to Article 3 of landfill directive (LF)	2.00	43
Quantity of hazardous waste co-incinerated (IHW)	2.00	43
Heat recovery from incineration of non-hazardous waste	2.00	43
Information on collection and treatment of landfill gas (LF)	1.92	43
NACE code	1.83	43
Re-equipped landfills (LF)	1.83	43
Source of waste incinerated (in-house/third parties)	1.83	57
Heat recovery from incineration of hazardous waste	1.83	57
Air emission limit values for incineration plant (IPPC)	1.80	57
Contact person (company/facility)	1.75	71
Authorisations of discharges of dangerous substances (PG)	1.63	29
Contribution of waste treatment to climate change (PP)	1.60	14
Total area of landfills (PP)	1.50	14
E-mail address	1.25	43
Eight-digit EWC code (PP)	1.25	29
URL	0.92	43

(IHW) = Council Directive 94/67/EC on the incineration of hazardous waste
(IPPC) = Council Directive 96/61/EC concerning integrated pollution prevention and control
(LF) = Council Directive 99/31/EC on the landfill of waste
(PG) = Council Directive 80/68/EEC on the protection of groundwater
(PP) = personal proposal

The results of the questionnaire request, presented in Table 4.2, show no clear and homogeneous picture of the NRCs' interests. Neither the data of a certain thematical groups, nor the data of certain directives are prioritised. Therefore it is not possible to state a common rule on which data to integrate into the extended dataset.

Furthermore, the result represents the opinion of only a third of the EEA member countries. The fact that the NRCs are not in favour of an extension of the dataset is also indicated by the very low return rate to this questionnaire.

5. Facilities for non-hazardous waste

5.1. Data request

To gain an impression of the availability of data on facilities for non-hazardous waste, a questionnaire survey within the ETC/W partner countries and regions was carried out. The request included incineration facilities and landfills for municipal and other non-hazardous waste. In order to ask only for data which is part of reporting obligations to the European Commission, data on IPPC-relevant facilities and landfills were requested. This means that only incineration facilities with a capacity of 3 tonnes per hour (about 25 000 tons per year) and landfills with a capacity of more than 10 tons per day (about 3 000 tons per year) were included in the data request. To facilitate work for the national contact persons for this data request the same core dataset with the same questionnaire as those for hazardous waste was used (see Chapter 3.1). For this survey the following two-digit code was used:

AT Austria
BW Baden-Württemberg
CA Catalunya
DK Denmark
IE Ireland

5.2. Data in the catalogue

5.2.1. Overview of delivered core data

The procedure of data processing is similar to the one for data about hazardous waste. The data delivered was validated and revised when necessary. In this case it was also impossible to import all data into the catalogue for software reasons. Therefore the numbers of companies, facilities and landfills in this report in some cases exceed the numbers in the catalogue.

An overview over the reported companies, incineration facilities and landfills is presented in Table 5.1.

Table 5.1: Number and R/D codes of incineration facilities and landfills for non-hazardous waste in the ETC/W partner countries/regions

Country or region	Companies	Incineration facilities			Landfills		
		Total	D10	R1	Total	D1	D5
Austria	75	10	0	10	73	0	73
Baden-Württemberg	n.d.	7	n.d.	n.d.	47	n.d.	n.d.
Catalunya	55	7	2	5	68	0	68
Denmark	131	34	14(1)	13(1)	100	95(2)	0(2)
Ireland	102	0	0	0	102	n.d.	n.d.
Total	**363**	**58**			**390**		

(1) additional seven facilities reported with both codes (D10 and R1)
(2) additional five landfills reported with both codes (D1 and D5)
n.d.: no data available

Baden-Württemberg delivered information about 7 incineration facilities and 47 landfills but failed to connect this information with data about the referring companies. Therefore it was not possible to import the data about the facilities and landfills into the catalogue, because the company is the necessary key code. Furthermore, data about the R/D codes of the facilities/landfills is not available for Baden-Württemberg.

Denmark reported seven incineration facilities and five landfills with a combination of the two relevant R/D codes (D10/R1 and D1/D5).

In Ireland no incineration facility for non-hazardous waste is in operation. Data about the R/D codes of the landfills is not available.

The number of R/D codes for landfills shows the different understanding of R/D codes in the countries. While Austria and Catalunya classified all of their landfills as D5, Denmark used almost exclusively code D1. There are probably no large differences in the technical standard of the landfills between these countries, thus the discrepancy seems to derive from different use of R/D codes.

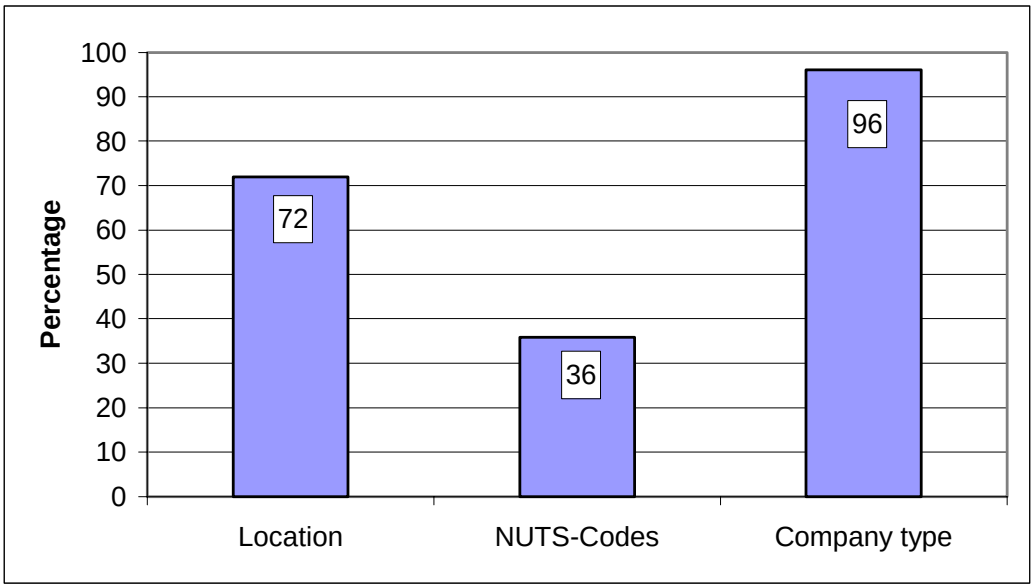
5.2.2. Completeness of datasets

The procedure for showing the completeness of datasets is similar to the one for data about hazardous waste. The percentage of delivered data of a specific parameter in relation to the number of delivered companies, facilities or landfills was calculated.

For companies, incineration facilities and landfills the same set of parameters is used as for data on hazardous waste. This procedure allows a comparison of the availability of data from the two core datasets.

The comparison of the completeness of the datasets for companies (see Diagram 3.1 and Diagram 5.1) shows that the availability of data about the location is at the same level, while for NUTS codes data availability in the non-hazardous waste sector is much lower and for company type is much higher.

Diagram 5.1: Completeness of company data (non-hazardous waste)



Concerning facilities and landfills both datasets show the same structure (see Diagram 3.2, Diagram 3.3, Diagram 5.2 and Diagram 5.3). Availability of data about location and R/D codes is always much higher than for the other parameters, in most cases it is nearly up to 100 %. Data completeness concerning total capacity of facilities is higher than total disposal volume for landfills. Very specific information about capacities/disposal volume referring to R/D codes and waste types is low for all facilities/landfills. Availability of data concerning treated waste types vacillates between 30 and 60 %.

Diagram 5.2: Completeness of incineration facility data (non-hazardous waste)

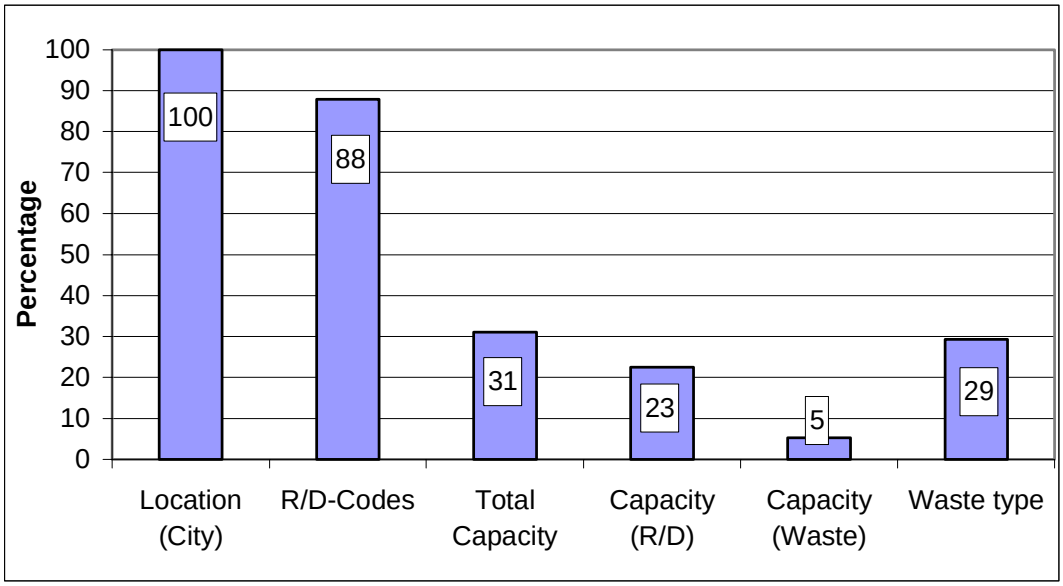
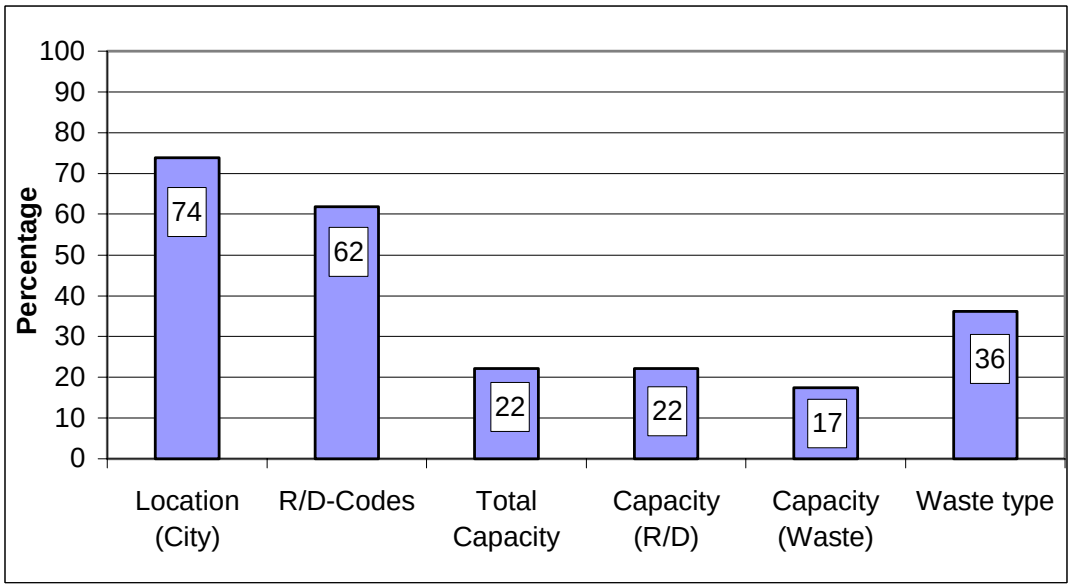


Diagram 5.3: Completeness of landfill data (non-hazardous waste)



In summary, it can be stated that the availability of data for selected facilities and landfills for non-hazardous waste is in the same range as the data for facilities and landfills for hazardous waste.

6. Conclusions — further activities

6.1. Conclusions concerning the extension of the catalogue

There are many possibilities to extend the existing dataset in the catalogue on waste management facilities. Two extensions were investigated in this report.

Extension of the core dataset
Experiences from the questionnaire request show that data collection even on basic data is very time consuming and takes a lot of effort by the NRCs. Therefore the core dataset about facilities for hazardous waste should be extended very carefully. The following two extensions are possible:

- environmental impacts of waste management facilities;
- transfrontier shipment of hazardous waste.

Facilities and landfills for non-hazardous waste
The questionnaire request showed that data about incineration facilities and landfills for non-hazardous waste relevant to the IPPC directive in principle is available. This experience is supported by a report from the international solid waste association (ISWA) that investigated waste incineration facilities in detail (ISWA 1997). Therefore it should be possible to obtain at least basic information about waste incineration facilities and landfills for non-hazardous waste in all EEA member countries. The core dataset should comprise the following parameters:

- name
- location (zip code, city, address)
- R/D code
- NUTS code level 3
- total capacity / total disposal volume
- free disposal volume for landfills.

Experience shows that more detailed information is not available for most member countries.

The availability of data about other facilities for hazardous waste (landfills for inert waste, facilities for sorting of waste, etc.) has not yet been investigated. However, taking into consideration the high number of such facilities, it does not seem possible to include them into the catalogue. Also the low interest expressed by the NRCs to provide additional data has to be considered.

Accession countries
In addition to the above extensions, it will be necessary to include the accession countries into the existing system of waste data collection. As a number of accession countries are expected to become EEA members in the near future, this objective is very important and acute. The first step will be the establishment of an information network with contact persons in every country. More detailed investigations about this objective have to be elaborated.

6.2. Further activities

The further development of the catalogue on waste management facilities should clearly reflect the needs of the relevant stakeholders, especially the Environment DG and EEA member countries. For the time being these needs are identified as follows:

Member countries
As mentioned before, waste data collection demands much time and efforts. Therefore data delivery should be streamlined in the best possible way to avoid duplication of work. The data content of the catalogue for hazardous waste management facilities is identical with the format of information to be provided pursuant to Article 8 (3) of Council Directive 91/689/EEC on hazardous waste (Commission Decision 96/302/EC). Therefore the best way to save time and effort of the EU Member States would be the decision to make the catalogue on waste management facilities a tool with which they can fulfil the above mentioned reporting obligations.

The Environment DG
At the moment the Environment DG receives information about hazardous waste management facilities in EU Member States from 15 individual reports according to the above reporting obligations. This crude data, however, has to be processed and evaluated before it can be used for policy-making. The catalogue on waste management facilities in the 18 EEA member countries is already equipped with a number of evaluation tools. Therefore, this catalogue will be very useful for the Environment DG to obtain necessary information about the treatment of hazardous waste in Europe, and has to be updated annually.

To summarise, the catalogue for waste management facilities will bring its best results, if all relevant stakeholders decide to make it a tool for the EU Member States to fulfil their reporting obligations according to Article 8(3) of Council Directive 91/689/EEC on hazardous waste. To reach this target the following work steps have to be taken:

- discussion and agreement with the Environment DG;
- discussion with selected member countries;
- development of an input template;
- test phase of the new reporting tool in selected EU Member States;
- implementation of the new reporting tool.

Through discussions with the Environment DG and the EU Member States further needs for information concerning the catalogue for waste management facilities can be identified and included in the future development of the catalogue.

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'ISWA Working Group on thermal treatment of waste' (Ed.), *Energy from waste, state of the art report, statistics 1993–96* (3rd Edition). Copenhagen, 1997.

Annex 1: Completeness of datasets (hazardous waste)

Annex 1.1 Completeness of company data (hazardous waste) (in %)

Country	Name	Zip code	City	Address	NUTS code	Company type
AT	100	100	100	100	100	100
BE	100	98	98	98	98	100
DE	100	100	100	95	0	0
DK	100	100	100	100	100	97
ES	100	100	100	100	100	0
FI	100	100	100	96	100	100
FR	100	100	100	94	100	100
GR	100	69	92	77	23	100
IE	100	100	100	100	100	100
IS	100	100	100	100	0	100
IT	100	0	0	0	99	8
LI	100	100	100	100	0	100
LU	100	100	100	100	100	100
NL	100	100	100	100	0	0
NO	100	100	100	91	100	100
PT	100	100	100	100	100	100
SE	100	100	100	80	100	100

Annex 1.2 Completeness of facility data (hazardous waste) (in %)

Country	R/D code	Capacity ref. to R/D code	Zip code	City	Address	NUTS code	Total capacity	In operation since	Waste types	Capacity ref. to waste types
AT	100	0	100	100	89	100	50	3	100	0
BE	99	0	100	100	100	100	36	0	91	0
DE	100	0	100	100	96	0	66	0	0	0
DK	100	2	100	100	100	100	2	78	96	0
ES	100	67	100	100	100	100	65	0	92	55
FI	100	55	100	100	100	100	61	4	95	45
FR	100	0	100	100	0	100	0	0	0	0
GR	100	0	0	38	38	38	0	38	31	0
IE	100	8	100	100	100	100	75	83	0	0
IS	100	100	100	100	100	0	100	100	100	0
IT	100	0	73	73	66	99	45	0	98	54
LI	100	0	100	100	100	0	0	100	100	67
LU	100	67	100	100	100	100	100	100	100	33
NL	100	0	100	100	100	0	25	0	100	0
NO	100	0	100	100	92	100	8	100	89	5
PT	100	0	100	100	100	100	0	100	71	0

Annex 1.3 Completeness of landfill data (hazardous waste) (in %)

Country	D-code	Disp. vol. ref. to R/D code	Zip code	City	Address	NUTS code	Total disp. vol.	In operation since	Waste types	Disp. vol. ref. to waste types	Available disp. vol.
BE	100	100	89	89	56	89	56	0	11	0	56
DE	100	0	100	100	86	0	0	0	0	0	0
DK	100	8	100	100	100	100	8	8	92	0	0
ES	100	100	100	100	100	100	90	0	60	40	0
FI	100	0	100	100	100	100	0	22	100	0	0
FR	100	0	0	100	0	0	0	0	0	0	50
IT	100	0	97	100	97	97	82	0	97	97	62
NL	100	0	100	100	100	0	0	0	100	0	82
NO	100	100	100	100	100	100	100	100	100	100	100
PT	100	100	100	100	100	100	100	100	100	0	100

Annex 2: Questionnaire 'Extended dataset'

Possible extensions for the dataset of the catalogue on waste management facilities

Requested information	Description of the extended data	Priority 1 = low 3 = High	Data available? (Y/N)
Common data on companies and facilities			
NACE code	Classification according to Council Regulation (EEC) No 3037/90 of 9 October 1990 on the statistical classification of economic activities in the European Community (PP)		
Contact person (company/facility)	Name of the contact person of a company or facility, telephone number and fax number (PP)		
URL	The homepage of the company or facility (PP)		
E-mail address	The e-mail address of the company or facility (PP)		
Common data according to the authorisation permit			
Operating capacity	Operating capacity of an incineration plant for hazardous waste (IHW)		
Air emission limit values	Air emission limit values for incineration plants for hazardous waste and for waste management facilities according to the IPPC directive (IHW, IPPC)		
Emissions concerning air	Emissions concerning air of waste management facilities and landfills that have to be reported according to the IPPC directive		
Emissions concerning water	Emissions concerning water of waste management facilities and landfills that have to be reported according to the IPPC directive		
Emissions concerning soil	Emissions concerning soil of waste management facilities and landfills that have to be reported according to the IPPC directive		
Technology and other techniques for preventing or reducing emissions	Technology and other techniques for preventing or reducing emissions of waste management facilities and landfills that have to be reported according to the IPPC directive		
Authorisations of discharges of dangerous substances	Authorisations of discharges of substances in list I and II of Directive 80/68/EEC into groundwater indicating geographical locations and date of authorisation (PG)		
Acceptance criteria for wastes	Acceptance criteria for wastes at a facility (e.g. certain waste types) (PP)		
Input of wastes	Input of wastes in a facility (waste types and quantities according to authorisation permit) (PP)		
Output of wastes	Output of wastes out of a facility (waste types and quantities acc. to authorisation permit) (PP)		
Specific data on landfills			
Quantity of biodegradable waste	Quantity of biodegradable waste deposited on a certain landfill (LF)		
Information about excluded landfills according to Article 3	E.g. address and total disposal volume of excluded landfills according to article 3 of the landfill directive (LF)		
Number of landfills	Number of landfills related to the classes of landfill (LF)		
Complying with directive	Is the landfill complying with the demands of the Directive (related to the classes of landfill)? (LF)		
Closed/to be closed	Is the landfill closed or to be closed (related to the classes of landfill)? (LF)		
Re-equipped	Is the landfill re-equipped (related to the classes of landfill)? (LF)		
Rest capacity	rest capacity of the landfill (related to the classes of landfill) (LF)		
Average landfill prices	landfill price at a key date (LF)		

Charges/taxes	charges/taxes for landfilling at a key date (LF)		
Information on collection and treatment of landfill gas	Is landfill gas collected? If yes, is it burned in a torch or used for energy recovery? What is the quantity of recovered energy? (LF)		
Total area of landfills	total area of a landfill in m² (PP)		
Specific data on incineration plants			
Source of waste incinerated	Incineration of own hazardous waste or hazardous waste of third parties (IHW)		
Co-incineration	Quantity of waste coincinerated in an incineration plant for hazardous waste (IHW)		
	Quantity of waste coincinerated in an incineration plant for non-hazardous waste (PP)		
Treatment of incineration residues	Pre-treatment and subsequent recovery or disposal of residues from the incineration of hazardous waste (IHW)		
	Pre-treatment and subsequent recovery or disposal of residues from the incineration of non-hazardous waste (PP)		
Heat recovery	Type of heat recovery and its efficiency from the incineration of hazardous waste (IHW)		
	Type of heat recovery and its efficiency from the incineration of hazardous waste (PP)		
Others			
Eight-digit EWC code	Extension of the EWC code from six to eight digits according to national legislations (PP)		
Comment to the capacity	unit of the capacity (PP)		
Import of waste	Import of waste by a facility (waste type, quantity, recovery/disposal method) (PP)		
Export of waste	Export of waste by a facility (waste type, quantity, recovery/disposal method) (PP)		
Contribution to climate change	contribution of waste management facilities to climate change (PP)		
Room for your proposals			

(IHW) = Council Directive 94/67/EC on the incineration of hazardous waste
(IPPC) = Council Directive 96/61/EC concerning integrated pollution prevention and control
(LF) = Council Directive 99/31/EC on the landfill of waste
(PG) = Council Directive 80/68/EEC on the protection of groundwater
(PP) = personal proposal

Annex 3: Results of the questionnaire request 'Extended dataset'

Annex 3.1 Priority list of requested information

REQUESTED INFORMATION	AT	DK	FR	GR	UK	NO	Arithmet. mean
NACE code	3	1	1	2	1	3	1.83
Contact person (company/facility)	2	1	1	3	0.5	3	1.75
URL	1	1	1	1	0.5	1	0.92
E-mail address	1	1	1	2	0.5	2	1.25
Operating capacity of incineration plant (IHW)	3	3	1	3	3	3	2.67
Air emission limit values for incineration plant (IHW)	1	1		2	3	2	1.80
Emissions concerning air (IPPC)	3	1		2	3	2	2.20
Emissions concerning water (IPPC)	3	1		2	3	2	2.20
Authorisations of discharges of dangerous substances (PG)	1			2	2.5	1	1.63
Acceptance criteria for wastes (PP)	3	3	2	2	1.5	1	2.08
Input of wastes (PP)	3	3	2	3	2	3	2.67
Output of wastes (PP)	3	3	2	3	2	3	2.67
Quantity of biodegradable waste (LF)	1	3	2	3	1	3	2.17
Information about excluded landfills according to Article 3 (LF)	1	3		3	2	1	2.00
Number of landfills (LF)	3	3	3	3	2	3	2.83
Landfills complying with directive (LF)	1	3	2	3	2	3	2.33
Landfills closed / to be closed (LF)	3	3	3	3	1	1	2.33
Landfills re-equipped (LF)	1	3	2	3	1	1	1.83
Rest capacity of landfills (LF)	3	3	1	3	1	3	2.33
Average landfill prices (LF)	1	3	2	3	1	3	2.17
Charges/taxes for landfilling (LF)	1	3	2	3	1	3	2.17
Information on collection and treatment of landfill gas (LF)	1	1	2	3	1.5	3	1.92
Total area of landfills (PP)	1	1	1	3	1	2	1.50
Source of waste incinerated (in-house/third parties)	2	1	1	3	1	3	1.83
Quantity of hazardous waste co-incinerated (IHW)	3	1	2	2	1	3	2.00
Treatment of incineration residues from hazardous waste (IHW)	2	3	2	2	1	3	2.17
Treatment of incineration residues from non-hazardous waste	2	3	2	2	1	3	2.17
Heat recovery from incineration of hazardous waste (IHW)	1	3	1	2	1	3	1.83
Heat recovery from incineration of non-hazardous waste (IHW)	1	3		2	1	3	2.00
Eight-digit EWC code (PP)	3	1	1	1	0.5	1	1.25
Comment to the capacity (unit) (PP)	3			3	1	2	2.25
Import of waste (PP)	3	1	1	3	2	3	2.17
Export of waste (PP)	3	1	1	3	2	3	2.17
Contribution to climate change (PP)	2		1	1	1	3	1.60

Annex 3.2 Availability of requested information

REQUESTED INFORMATION	AT	DK	FR	GR	IT	UK	NO	Σ Y. S. L
NACE code	N	N	N	Y	Y	N	Y	43 %
Contact person (company/facility)	Y	Y	Y	Y	N	N	Y	71 %
URL	P	Y	N	Y	N	N	N	43 %
E-mail address	P	Y	N	Y	N	N	N	43 %
Common data according to the authorisation permit								
Operating capacity of incineration plant (IHW)	Y	Y	Y	Y	Y	Y	Y	100 %
Air emission limit values for incineration plant (IHW)	N	N		P	Y	Y	Y	57 %
Emissions concerning air (IPPC)	P	N		P	L	L	N	57 %
Emissions concerning water (IPPC)	P	N		P	L	L	N	57 %
Authorisations of discharges of dangerous substances (PG)	N			P	Y	N	N	29 %
Acceptance criteria for wastes (PP)	N	N	Y	N	Y	L	N	43 %
Input of wastes (PP)	Y	N	Y	P	N	L		57 %
Output of wastes (PP)	Y	N		P	N	L		43 %
Specific data on landfills								
Quantity of biodegradable waste (LF)	Y	P		P	L	N	N	57 %
Information about excluded landfills according to Article 3 (LF)	Y	L		N	L	N	N	43 %
Number of landfills (LF)	Y	L	Y	N	Y	P	Y	86 %
Landfills complying with directive (LF)	Y	L	N	P	L	P	N	71 %
Landfills closed/to be closed (LF)	Y	L	N	N	L	Y	N	57 %
Landfills re-equipped (LF)	N	L	N	P	L	N	N	43 %
Rest capacity of landfills (LF)	L	L	N	N	Y	N	N	43 %
Average landfill prices (LF)	P	N	Y	N	Y	N	N	43 %
Charges/taxes for landfilling(LF)	Y	Y	Y	N	Y	Y	Y	86 %
Information on collection and treatment of landfill gas (LF)	L	N	Y	N	N	Y	N	43 %
Total area of landfills (PP)	N	N	N	P	N	N	N	14 %
Specific data on incineration plants								
Source of waste incinerated (in-house/third parties)	Y	N	N	Y	Y	N	Y	57 %
Quantity of hazardous waste co-incinerated (IHW)	P	N	Y	N	N	N	Y	43 %
Treatment of incineration residues from hazardous waste (IHW)	N	Y	Y	N	Y	Y	N	57 %
Treatment of incineration residues from non-hazardous waste	N	Y	Y	N	Y	Y	N	57 %
Heat recovery from incineration of hazardous waste (IHW)	N	N	Y	N	Y	Y	Y	57 %
Heat recovery from incineration of non-hazardous waste (IHW)	N	N		N	Y	Y	S	43 %
Others								
Eight-digit EWC code (PP)	Y	P	N	N	N	N	N	29 %
Comment to the capacity (unit) (PP)	Y			Y	Y	N		43 %
Import of waste (PP)	Y	Y	Y	P	Y	Y	N	86 %
Export of waste (PP)	Y	Y	Y	Y	Y	Y	Y	100 %
Contribution to climate change (PP)	N		N	N	Y	N	N	14 %

Additional proposals:

- residues from waste treatment (DK)
- landfill leachates (GR)

P = partly (regarded as Yes)
L = later (regarded as Yes)