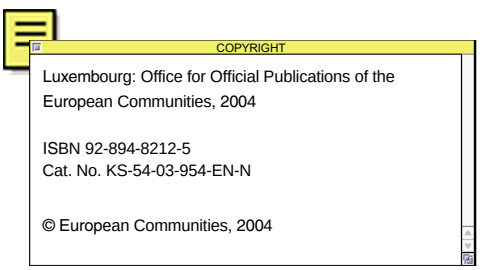
DETAILED TABLES

2003 EDITION

Hazardous and Industrial Waste Management

in accession Countries



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Preface

The European Union is facing one of the biggest challenges of its history: the forthcoming enlargement. It is foreseen that 10 accession countries will enter the European Union in May 2004 and that they can take part in the elections to the European Parliament in 2004 as full members. Enlargement of the European Union will also lead to an expansion of environmental protection.

As part of the accession process, applicants will have to adopt EU environmental legislation.

With regard to waste management nearly all accession countries have already implemented the EU Directives and Regulations into national legislation and are in the process of preparing the forthcoming Regulations. Environmental problems resulting from unsafe and inadequate waste management also still exist in the EU Member States. In addition, negative news items regularly appear which show that waste management will surely remain on the environmental policy agenda. Accurate supervision of and precise information on waste management are necessary. The legacy of inadequate waste management exemplified by dangerous dumping sites still results in human health and ecological problems. Waste management problems in the accession countries are extreme compared to EU countries. EU countries were able to slowly develop their capacities to treat and dispose of waste in an adequate way and, in addition, they have developed strategies for waste prevention, strongly supported by the Commission.

Contrary to this favorable situation in the European Union, production processes in accession countries did result up to the end of the 1980s in enormous amounts of wastes produced, stored and disposed far from appropriate. In order to restructure and modernise waste management, the accession countries need, first of all, technical and financial support. But the establishment of a high quality and efficient information and reporting system is just as important. Without such an information system waste management will decrease in quality. The accession countries are aware of the importance of information and reporting on waste management and they are improving their systems continuously. It is important that accession countries are also fully integrated into the European Statistical System so that information which is needed by policy makers and the general public is available in a harmonised form, and is comparable among countries. For a number of years the accession countries have been fully integrated into the environment statistics data collection activities of Eurostat. The availability of data has increased substantially in the last few years and is, with a few exceptions, comparable to that provided by the Member States. Timeliness and freshness of the data reported are often superior to data from the Member States.

The study presented here is the result of a PHARE Multi-country project on hazardous waste and non hazardous industrial waste carried out by LANDSIS g.e.i.e. in co-operation with ARGUS GmbH between March 2002 and August 2003. The study assembles the information available on waste management of industrial and hazardous waste in Accession Countries. In addition to the harmonised statistical waste information regularly collected via the Eurostat/OECD Joint Questionnaire also additional information is given. The intention was to give a thorough and comparable picture on waste management in the accession countries. The picture includes also the description of state-of-the-art with relation to:

- Waste legislation;
- Institutional framework and
- Waste information collection.

In addition, national pilot studies which were carried out in the framework of this project are described. The pilot study reports which are considerably improving the situation on waste information will be soon available at Eurostat web site.

The study is concluded with a country comparison based on the information from Eurostat/OECD Joint Questionnaire. We hope that the study will help to increase and improve the efforts towards reaching an efficient information system on waste and will stress the importance of building up harmonized waste information.

Rainer Muthmann
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Introduction

General Remarks

This publication has been prepared as a result of a multi-country project within the PHARE environment statistics support programme, addressed to the EU Accession Countries. This project was divided into two phases. Phase I of this project dealt with municipal waste. Within the frame of Phase I a publication on 'Municipal Waste Management in Accession Countries' was compiled [(1)]. The present publication is based on Phase II of the project, entitled 'Harmonised Environment Statistics Phase II on Hazardous and Non-hazardous Industrial Waste'. The project was carried out over a period of 18 month from March 2002 until August 2003. The topics of Phase II were directly related to the reporting obligations on waste statistics as stipulated in the new EU Commission Regulation on Waste Statistics. Objectives were to identify precisely the problems regarding data availability, data quality, classifications and economic breakdown of waste management companies. In this context support activities were carried out and projects were initiated to improve the situation on waste statistics significantly.

During the project eight Accession Countries conducted pilot projects dealing with country specific problems in the field of data management and statistics for hazardous and non-hazardous industrial waste. The contents and the outcomes of the different pilot projects will be described in the respective country chapter.

In addition two workshops were held:

- Waste information quality with regard to EWC/EWCStat application (October 2002 in Bled, Slovenia);
- Data survey on hazardous and non-hazardous industrial waste under special consideration of 'register improvement', 'questionnaire design' and 'information generation from reporting forms' (March 2003 in Berlin, Germany).

The countries were represented by members of the ministry of environment and the statistical office.

The discussions and analyses within the project about current and future data collection systems on hazardous and non-hazardous industrial waste served as a basis for the compilation of the present publication.

This publication provides an overview of the data situation regarding hazardous and non-hazardous industrial waste in ten EU Accession Countries. The main data source for this issue is the Eurostat/OECD Joint Questionnaire (JQ). In addition all information available on national and EU level was used to describe the legislative basis, the role of administration and the applied methodology for data collection and processing of hazardous and non-hazardous industrial waste. Furthermore the Phase I publication on municipal waste [1] served as a general source for the description of legislative and institutional framework in the different countries.

Information collected using Eurostat/OECD Joint Questionnaire

The Eurostat/OECD Joint Questionnaire (JQ) on waste is collecting information in a 2-yearly periodicity from OECD countries including European countries. Eurostat exploits only the information from the EU Member States and the Accession Countries.

The data collection on hazardous waste and non-hazardous industrial waste comprises four different tables of the JQ. The structure of the JQ is mainly responsible for the consistency, degree of aggregation and the quality of the reported data. The JQ considers generation of waste amounts according to economic sectors. The economic sectors are specified according to NACE sections (Statistical Classification of Economic Activities in the European Community, Rev 1).[(2)]

The following tables of the JQ served as the basis for the present publication:

- **Table 1** is asking for the total waste generation of a country by various economic sectors. Table 1 explicitly asks for waste generation in the NACE sections A (agriculture, hunting and forestry), C (mining and quarrying), D (manufacturing), E (energy production, water supply), F (construction) and O (sewage and refuse disposal). Other sections such as wholesale and retail trade, hotels and restaurants, public administration etc are not mentioned but can be subsumed in the category 'other sectors'. On the other hand the waste from 'manufacturing' (NACE section D) is subdivided into various NACE divisions (15-37). For each waste amount the share of hazardous waste shall be specified in the table.
- **Table 3** is named 'generation, treatment and disposal of non-hazardous industrial waste' but actually refers to waste from manufacturing industry only. The amounts reported should refer to waste from the manufacturing industry sector (only NACE D) and be consistent with amounts reported in table 1, i.e. total amounts from NACE divisions 15-37 minus the share of hazardous waste. The JQ contains no tables on the treatment and disposal of non-hazardous waste from other sections.
- **Table 4a** is asking for generation, treatment and disposal of hazardous waste. Treatment and disposal operations shall be specified according to the R / D codes as listed in the Waste Framework Directive. Total amounts of hazardous waste reported in table 4a should be consistent with those reported in Table1.
- **Table 6** collects data on the number of existing waste treatment and disposal installations for hazardous and non-hazardous waste, the related treatment capacity and the annual input. Table 6 specifies landfills, incineration plants (with and without energy recovery), treatment plants, permanent storage and others. A specification according to R / D codes as in Table 4a is not required.

(1) Eurostat: Municipal Waste Management in Accession Countries, Theme 8 Environment and Energy , Luxembourg 2002
(2) The NACE classification comprises main branches (sections), represented by the section codes A-Q. The sections are subdivided into divisions, represented by a two digit number.

Definitions

This publication focuses on hazardous waste and on non-hazardous industrial waste. For the term industrial waste no official definition exists. For this reason, the following definitions clarify how the terms 'industrial waste' and 'hazardous waste' have been used in the present publication.

Industrial waste: Waste from enterprises as requested by the JQ. Industrial waste covers the NACE sections C (mining and quarrying), D (manufacturing), E (energy production, water supply), F (construction) and O (sewage and refuse disposal). In addition the rubric 'other sectors' was considered. The types and amount of wastes subsumed in this category depend on the specifications of the different countries. Excluded is waste from section A (agriculture, hunting and forestry) and municipal waste.

Hazardous waste: hazardous waste of all sources mentioned in the JQ, including NACE section A (agriculture, hunting and forestry) and municipals waste.

Current Situation of Waste Management in Accession Countries

Bulgaria

Basic information

Bulgaria covers an area of 110 994 km² and is the third largest of the candidate countries. With a population of about 8 million Bulgaria is quite sparsely populated. More than 70 % of the population lives in cities of which Sofia, the capital of Bulgaria, is the biggest with about 1.2 million inhabitants. The Bulgarian population decreased significantly during recent years. Bulgaria consists of 28 districts and six planning regions.

Following the economic crisis in 1996/97 with negative real GDP growth, the currency board arrangement introduced in July 1997 has helped to stabilise the economy and to achieve real GDP growth of close to 4 % on average since 1998 [1]. Nevertheless, Bulgaria has one of the lowest GDP per capita among the candidate countries.

Table 2.1

Macroeconomic indicators in Bulgaria

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	8 312	8 257	8 211	8 170	7 915
GDP at current prices (million euro)	9.2	11.4	12.2	13.7	15.2
GDP per capita at current prices (euro)	1 100	1 400	1 500	1 700	1 900
Change of GDP over previous year (%)	– 5.6	4.0	2.3	5.4	4.0
Structure of production(% of gross value added)					
Agriculture	26.6	20.2	16.2	13.8	
Industry	25.4	23.9	21.6	23.0	
Construction	2.8	3.6	3.5	3.5	
Services	45.2	52.4	58.7	59.8	

Source: *[1]*

The most important economic sectors are the chemical industry, food, beverages, tobacco, metal industry, fabricated metal products and machinery, glass and porcelain industries, coal mining, steel production, power industries and tourism.

Waste legislation

The framework for Bulgarian waste legislation is defined by the Reduction of the Harmful Impact of Waste upon the Environment Act (RHIWEA) (State Gazette No 86/1997, as amended by State Gazette No 28/2000). The RHIWEA creates the legal basis for secondary legislation. In accordance with this framework law a number of regulations on hazardous waste and non-hazardous industrial waste have been developed and adopted. They regulate specific aspects of waste management and administrative procedures, institutions, reporting obligations, etc.

Permits and licenses

Permits and licenses for the collection, transportation, storage and treatment of hazardous waste as well as non-hazardous industrial waste are issued and handled by the regional inspectorates of the environment and water (RIEWs) for regional activities. In case of activities that concern the territory of more than one RIEW (national activities), permits and licenses are issued and handled by the Ministry of the Environment and Water (MoEW). The legal basis for issuing permits is Decree No 53 (regulation on the requirements for treatment and transportation of industrial and hazardous waste, State Gazette No 29/1999) and Decree No 249 for approval of a tariff for fees, collected in the system of Ministry of the Environment and Water and by municipalities for issuing of permits according to the RHIWEA (State Gazette No 137/1998, as amended State Gazette No 25/2003).

Record-keeping and reporting obligations

Regulation No 10 on the filling out of the report and the waste management information documents (State Gazette No 151/1998) sets out the procedure for the filling out of all documents concerning the reporting and information related to the waste management activities. As regards industrial waste and hazardous waste the following annual reports have to be compiled by persons who generate hazardous waste, who generate industrial waste (more than 100 kg/d or 0.1 m³/d) or who treat waste:

- industrial waste report — information card for each year (previous year);
- hazardous waste information card — information card for each year (previous year);
- hazardous waste declaration — information card for each year (current year).

Regarding different waste management activities the following forms have to be filled out:

- report card for delivery, transportation and reception of hazardous waste;
- report book for industrial and hazardous waste — to be kept by persons who generate hazardous waste, who generate industrial waste (more than 100 kg/d or 0.1 m³/d) or who treat waste. The report books have to be filled in autographically at least once a week. They have to be inspected and certified by an RIEW at least once a year;
- report book for landfill — to be filled out for landfills by responsible persons of municipalities or operating companies;
- form for the notification of transboundary movement of waste (according to regulation for the cases that require a

permit for the import, export and transit transportation of waste, and the conditions and procedures for permit issuance, State Gazette No 66/2000).

The regional inspectorates (RIEWs) keep registers on waste management permits at the regional level. The Ministry of the Environment and Water (MoEW) keeps a register of waste management permits at the national level as well as a register on permits for import, export and transit transportation of waste. The RIEWs control the fulfillment of requirements according to the issued permits.

Waste classification

Until 1998 a waste nomenclature according to the National Statistical Institute (NSI) was used for the monitoring of industrial waste, comprising 82 types of waste. In addition a classification on hazardous waste was used, which was included in Decree 153 on collection, transportation, storage and treatment of hazardous waste (State Gazette No 70/1993).In 1998 the European waste catalogue (Decision 94/3/EC and Decision 94/904/EC) was adopted as national legislation on the basis of Order No RD-323/1998 on waste classification. In the near future a new national waste classification according to the European waste list (Decision 2001/118/EC) will be introduced.

Pending regulations

A new Waste Management Act is currently undergoing the approval procedure in the Bulgarian Parliament. The Act will repeal the existing Reduction of the Harmful Impact of Waste upon the Environment Act (RHIWEA) and on this basis a new secondary legislation will have to be issued within the next year. To this end a new regulation on waste documentation and reporting, which will replace the existing Regulation No 10 (regulation on the filling out of the report and the waste management information documents), is under development. In addition, a new national waste classification system corresponding to Decision 2001/118/EC will be introduced.

Institutional framework

The **Ministry of the Environment and Water** (MoEW) is responsible for development and implementation of national waste management policy.

The **Executive Environment Agency** (EEA) is responsible for collection and processing of waste management data.

Some **15 regional inspectorates of the environment and water** (RIEWs) are responsible for environmental control. They issue waste management permits at the regional level and conduct periodic inspections of waste disposal installations.

The **National Statistical Institute** (NSI) conducts annual surveys on municipal waste and non-hazardous industrial waste.

Waste information collection

Since 1998 data on waste management has been surveyed according to the classification system of the European waste catalogue (EWC). The data surveys are conducted by two different institutions:

- National Statistical Institute (NSI); and
- Executive Environment Agency (EEA).

The NSI conducts surveys on non-hazardous industrial waste and on municipal waste. The surveys are carried out once a year and about 6 500 companies are considered within the survey on industrial waste.

The Executive Environment Agency (EEA) handles the annual enterprise waste reports with relation to hazardous waste and non-hazardous industrial waste. In compliance with Regulation No 10 (on the filling out of the report and the waste management information documents) annual waste reports (information cards) have to be provided by:

- persons whose activity generates industrial waste in quantities over 100 kg/day or 0.1 m³/day;
- persons whose activity generates hazardous waste, unless generated only once as a result of household related activities;
- persons who treat waste.

The regional inspectorates (RIEWs) check and certify the reporting books. In addition they collect, verify and certify the annual reports (information cards) and send a copy to the EEA. The EEA processes and analyses the collected data on waste and publishes the results in the *Annual bulletin on the state of the environment in Bulgaria*. The IT department of the EEA keeps a register on waste management enterprises based on the statistics register, which is updated once a year.

Regarding the Eurostat/OECD joint questionnaire (JQ) the EEA provides data on hazardous waste to the NSI. The NSI links this data with NACE codes according to economic activities. Data on non-hazardous industrial waste is provided by both, the EEA and the NSI. The NSI adjusts the data and fills in the JQ. It is envisaged that the future cooperation between EEA and NSI in the field of waste data surveys will intensify.

Currently a national hazardous waste information system is under preparation and is expected to be in operation by the end of 2003. This database system will support the work of the EEA in the following ways:

- development of a hazardous waste registration system;
- development of the organisational and financial structure for hazardous waste facilities;
- logistic analysis for transportation of hazardous waste.

Pilot project

Within the Phare multi-country statistical cooperation programme, Phase II, Bulgaria conducted a pilot project which is entitled 'Improvement of the reporting system on hazardous waste through enhancement of the hazardous waste information system'. The work on the pilot project is nearly finished. The preliminary report of the pilot project comprises the following conclusions [2]:

Within the framework of the project, a number of analyses on the existing situation and practices for documentation and reporting related to hazardous waste activities were prepared. The analyses covered:

- the provisions in the existing national legislation in this field, as well as the provisions in the respective decisions, directives and regulations of the European Community;
- the existing administrative structure providing for the information system activities;
- reporting obligations of generators and holders of hazardous waste and resulting problems;

- specific requirements as regards the reporting on the so-called 'widespread types of hazardous waste' such as waste oils, batteries and accumulators, sludge from waste water treatment plants and luminescent lamps.

Following the analyses, the main problems caused by violation of the legislative requirements, lack of funding, problems related to the generation and treatment of hazardous waste and insufficient control on the indicated activities were specified. Therefore, no significant improvement in the information system's activities could be expected unless the implementation of respective changes in the whole hazardous waste management in Bulgaria and the introduction of adequate measures for legislation enforcement as well as provision of the necessary human resources, software and equipment take place.

Based on the identified weak points, proposals for the improvement of the hazardous waste information system were formulated. The proposals outline the main steps and conditions for improvement of the information system, including incorporation of additional data into the existing information cards and use of specialised questionnaires for the collection of information.

The proposal respects to a certain degree the elements of the existing information system. The additional data, which shall be included in the annual reports (information cards), take into account the changes in the national legislation after 1998.

One important point within the pilot project was the development of the proposal to amend the existing 'Regulation No 10 on the filling out of the report and the waste management information documents'. During the preparation of the proposal the provisions of the new draft Waste Management Act were considered. The proposed amendments aim at:

- stating more precisely the obligations of persons who generate hazardous wastes and persons collecting, storing, treating and disposing hazardous waste;
- specifying the formats of the documentation for the reporting and the information about waste activities;
- specifying the obligations of the competent authorities in accordance with the collection and processing of information about hazardous waste activities.

The most important activities pointed out in the pilot project were described in an action plan. The implementation of the measures in the proposed action plan and the adoption of the proposed amendments to the national legislation shall, in the short term, guarantee a significant improvement in the quality of the information collected and, in the long term, provide for the necessary conditions for sustainable reporting to the European institutions.

Data on waste management

The information on non-hazardous industrial waste and hazardous waste is based on the information cards submitted to the Executive Environment Agency (EEA) by enterprises with activities dealing with the generation and/or treatment of hazardous and non-hazardous industrial waste. In addition, data from the survey on industrial enterprises of the National Statistical Institute (NSI) according to economic sectors (NACE) is available.

Waste generation

Data on waste generation in Bulgaria are available from the joint questionnaire [5] only for the year 2001. Although such information has been collected regularly for years, Bulgaria did not provide data on this subject. One of the reasons is that the collected data come from different surveys and institutions (NSI, EEA) and were, up to this point, not compiled in accordance with the formats required by the joint questionnaire.

For the year 2001, Bulgaria reports a total waste generation of 90.4 million tonnes. Industrial waste amounts to 87.1 million tonnes (96.4 %) whereas municipal waste accounts for 3.2 million tonnes (3.6 %). For waste from agriculture and forestry a generated amount of 62 000 tonnes is reported (0.1 %).

The largest amount of industrial waste arises in the mining and quarrying industry and results in particular from the mining and processing of ore. Although quantities decreased considerably in recent years due to the closure of mining sites, the waste generated in 2001 still amounted to 68 million tonnes or 78 % of the industrial waste total. This amount corresponds to a per capita arising of 8.6 tonnes and exceeds the quantities reported by other candidate countries considerably. This is probably due to the fact that Bulgaria includes rock and soil from excavation in the reported figures which is not done by all countries in the same way.

Besides the mining sector, the energy producing industry is the largest waste generator. Waste from energy production amounts to 15.8 million tonnes or 18 % of the industrial waste total. The manufacturing industry contributes 3.6 % to the industrial waste total, with metal production and the chemical industry being the major waste-producing sectors. The remaining sectors, including the construction industry, come to only 0.1 %.

In the Annual bulletin 2000 [3] of the Executive Environmental Agency the industrial waste generation in 2000 is analysed more deeply (not considering mining and quarrying waste). It is stated that more than 90 % of the industrial waste was generated by only 30 of the 546 enterprises surveyed. The main generated waste types were inorganic wastes from thermal processes (EWC Chapter 10) and wastes from inorganic chemical processes (EWC Chapter 6).

Hazardous waste generation

Figure 2.2 shows the development of hazardous waste generation in Bulgaria for the period 1992 up to 2001. The data for 1992–97 is based on the national waste classification system according to Decree No 153 (State Gazette No 70/1993). The waste amounts for 1993 and 1994 include about 13 million tonnes of waste from excavation, production and treatment of mineral resources. Since 1996 the amount of hazardous waste from excavation, production and treatment of mineral resources have been excluded from the data analyses of industrial and hazardous waste due to their large share in the waste generation structure.

The changes in waste classification and the move from the national waste nomenclature to the European waste catalogue (EWC) complicates the comparison between the data received before and after 1998.

Not considering mining waste, the hazardous waste arising in Bulgaria amounted to 756 000 tonnes in 2001. The breakdown of this amount according to economic sectors is shown in Figure 2.3. Hazardous waste originates mainly from the manufacturing industry, in particular from metal works and refineries.

Figure 2.1

Breakdown of industrial waste generation (including hazardous waste) in Bulgaria by sectors in 2001 [5]

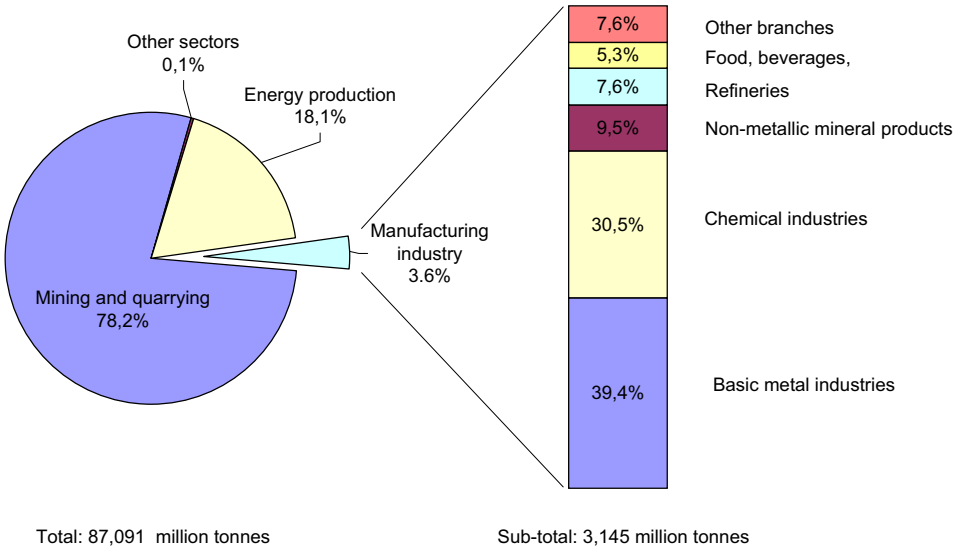


Figure 2.2

Development of hazardous waste generation in Bulgaria [5]

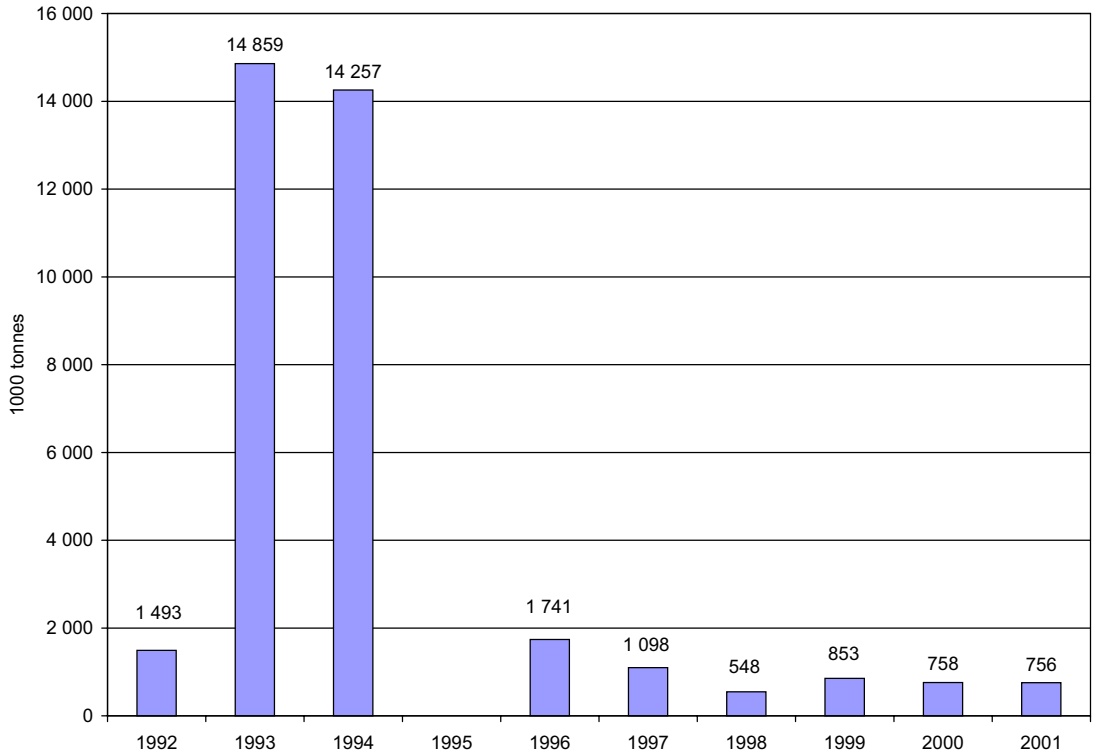
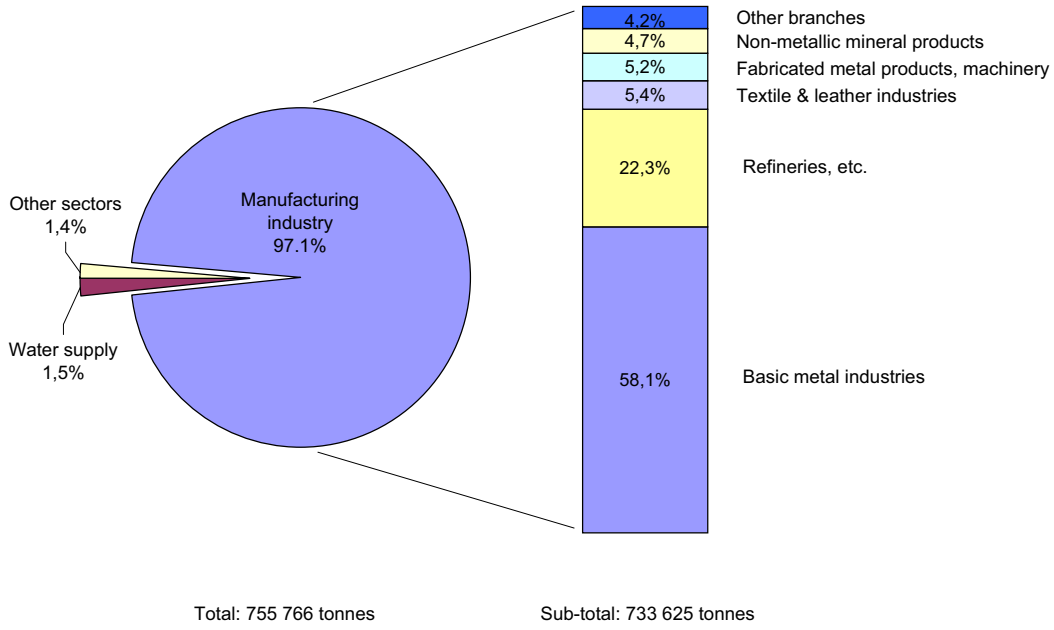


Figure 2.3

Breakdown of hazardous waste generation in Bulgaria by sectors in 2001 (excluding hazardous waste from mining and quarrying) [5]



In 2000, only 30 enterprises were the source of 97 % of the total of hazardous waste, and two companies (the steel works Kremkovtsi in Sofia and the refinery Lukoil-Neftochim in Bourgas) reported 57 % of the annual quantity of hazardous waste. Inorganic waste from thermal processes, oil waste and waste from waste water treatment accounted together for about 80 % of the hazardous waste total in 2000 [3].

Waste treatment and disposal

Non-hazardous industrial waste

Figure 2.2 shows the data on treatment and disposal of non-hazardous waste from the manufacturing industry as reported to Eurostat [5]. However, it has to be indicated that only the generated total refers to the manufacturing industry while the data on recovery and disposal include the amounts of all economic sectors. It also has to be pointed out that figures on non-hazardous waste do not include amounts which are internally recycled. To complement the information from the joint questionnaire, additional information on recovery and disposal was taken from the Annual bulletin 2000 [3].

In Bulgaria, landfilling is still the predominant disposal option for non-hazardous industrial waste. In the manufacturing industry the share of landfilled waste amounted to 75 % in 2001. The share of landfilled waste is highest for inorganic waste from thermal processes and waste from inorganic chemical processes. About 90 % of these wastes is deposited. The predominant part of the landfilled industrial waste, about 95 %, is disposed of on specialised landfills or other storage facilities operated by industry. The remaining 5 % is deposited together with municipal waste on municipal landfill sites [3].

In 2001, 366 000 tonnes of non-hazardous industrial waste were recycled. The predominant part of the recycled waste originates form manufacturing industry. According to the EEA's Annual bulletin recycling focuses on ferrous and non-ferrous metal waste and on waste paper. The EEA also reports that waste from food production and processing are used in agriculture as fodder or fertiliser.

In the joint questionnaire no data are reported on energy recovery of industrial waste. This might be due to the fact that the data on treatment and disposal of industrial waste do not include amounts which are internally recycled or reused. However in the Annual bulletin, the EEA reports that in 2000 about 60 000 tonnes of wastes were incinerated, mainly by the generating enterprises themselves. This was especially true for waste from wood processing and waste from food processing. According to Table 2.2, about 42 000 tonnes of non-hazardous industrial waste were incinerated without energy recovery. Thermal treatment of waste does not play an important role in waste disposal so far.

Information on available treatment and disposal installations for non-hazardous industrial waste is very poor, as Bulgaria did not provide data on this subject in the joint questionnaire.

Hazardous waste

The treatment and disposal operations for hazardous waste, as reported to Eurostat, are depicted in Table 2.3. In 2001, a total amount of 238 000 tonnes of hazardous waste was recovered in Bulgaria. This corresponds to a recovery rate of 31.5 %. The recovery operations, however, were not specified.

The EEA's Annual bulletin reports that in 2000 zinc slags and ashes, lead slags, lead accumulators and waste oils were among

the more important recycled wastes. In addition, waste from gas cleaning is used internally as secondary raw material by a cement enterprise, and Lukoil-Neftochim in Bourgas incinerated the major part of the generated oil sludges.

Table 2.2

Treatment and disposal of non-hazardous waste from manufacturing industry in Bulgaria in 2001 [5]

	1 000 tonnes	%
Total amounts generated by manufacturing industries of which designated for	2 411	
Recovery operations		
Recycling	366 (a)	
Incineration with energy recovery		
Disposal operations		
Incineration without energy recovery	42 (a)	
Landfill total amounts	85 142 (a)	
of which controlled landfill		

(a) Data refer to the non-hazardous industrial waste total.

Table 2.3

Treatment and disposal of hazardous waste in Bulgaria in 2001 [5]

	1 000 tonnes	%
Total amount generated	756	100.0 %
Recovery operations total, of which	238	31.5 %
Incineration with energy recovery (R1)	-	-
Recycling, composting, etc. (R2-6)	-	-
Other recovery operations (R7-11)	-	-
Preparatory activities (R12-13)	-	-
Disposal operations total, of which		-
Physico-chemical treatment (D9)	-	-
Biological treatment (D8)	-	-
Direct incineration without energy recovery (D10-11)	-	-
Landfill and other deposit into or onto land (D1-5)	518	68.5 %
Release into water bodies (D6-7)	-	-
Permanent storage (D12)		
Preparatory activities (D13-15)		-

The main method for hazardous waste treatment, however, is still landfilling. In 2001, 518 000 tonnes (68 %) of hazardous waste were disposed of, mainly in landfills on the premises of the generating enterprises. Most of these sites have exceeded their capacity and do not comply with the requirements laid down in the national waste legislation that is harmonised with the requirements of the respective EC directives [4]. Hazardous waste is also disposed of on municipal landfill sites. This applies mainly to sludge from waste water treatment facilities (municipal and industrial treatment plants), casting core sands, and flue gas dust [3].

Although no thermal treatment of waste is reported in the joint questionnaire, the Annual bulletin states that hospital waste is usually incinerated. Hospital waste incineration partially takes place in small facilities. Most of them do not comply with the current requirements for facilities of this type [3].

Information about the number of treatment and disposal installations for hazardous waste is not available as Bulgaria did not report on this subject in recent years due to a poor data situation.

Institutions and contacts

Institution	Contact
Ministry of the Environment and Water (MoEW)	www.moew.government.bg
Executive Environment Agency (EEA)	http://nfp-bg.eionet.eu.int/ncesd/index.html
National Statistical Institute (NSI)	www.nsi.bg

Relevant regulations

- Reduction of the Harmful Impact of Waste upon the Environment Act (RHIWEA), (State Gazette No 86 /1987, as amended — State Gazette No 28/2000);
- Order RD-323/1998 of the Minister of the Environment and Water and the Minister of Health on waste classification (State Gazette No 120/1998);
- Regulation No 10 on the filling out of the report and the waste management information documents (State Gazette No 151/1998);
- Decree No 53 of the Council of Ministers: Regulation on the treatment and transportation of industrial and hazardous waste, State Gazette No 29/1999)

References

[1] *2002 Regular report on Bulgaria's progress towards accession*, European Commission, October 2002

[2] *Improvement of the reporting system on hazardous waste through enhancement of the hazardous waste information system in Bulgaria*, preliminary report within the Phare multi-country statistical cooperation programme, Phase II, EEA Bulgaria, Sofia, 2003

[3] Annual bulletin 2000, Executive Environment Agency, Sofia, 2002 (http://nfp-bg.eionet.eu.int/eea/en/publicat/yearbook1/wastes/index.htm)

[4] Indicator report, Executive Environment Agency, Sofia, 2003 (http://nfp-bg.eionet.eu.int/eea/en/publicat/report/wastes/index.htm)

[5] Eurostat/OECD joint questionnaire (JQ) on waste

Czech Republic

Basic information

The Czech Republic consists of the three historical regions Bohemia, Moravia and Silesia. It covers an area of 78 864 km². The country is divided into 76 administrative districts and, since 1 January 2001, into 14 administrative regions. The population is 10.2 million with 1.3 million inhabitants living in Prague.

After the Velvet divorce with Slovakia in 1993, the Czech Republic experienced the so-called Czech miracle, a combination of a rapid transfer of ownership to the private sector, low unemployment and no hyperinflation. The country's mineral resources include coal and lignite, deposits of mercury, antimony, tin, lead, zinc and iron ore, and uranium. Processing industries (particularly for machinery, steel, chemicals, glass, and food) are highly developed. The country's main exports include manufactured goods, machinery, cars and transport equipment, and beer. Agriculture plays a comparatively small role alongside the traditional engineering and other industries [1].

Table 2.4

Macroeconomic indicators for the Czech Republic

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	10 304	10 295	10 283	10 273	10 224
GDP at current prices (million euro)	46.8	50.6	51.6	55.8	63.3
GDP per capita at current prices (euro)	4 500	4 900	5 000	5 400	6 200
Change of GDP over previous year (%)	– 0.8	– 1.0	0.5	3.3	3.3
Structure of production (% of gross value added)					
Agriculture	4.4	4.6	4.2	4.3	4.2
Industry	34.1	32.5	31.8	32.3	32.9
Construction	8.0	7.2	7.2	7.1	7.2
Services	53.4	55.7	56.8	56.3	55.8

Source: *[2]*

Following a balance-of-payments crisis the country experienced a recession between 1997 and 1999. Since 2000, the Czech economy has resumed growth in a context of low inflation but significant unemployment [1].

Waste legislation

Act No 125/1997 on waste, in effect since 1 January 1998, formed the legal framework for waste management in the Czech Republic. On 31 December 2001 it was repealed by the new Waste Act No 185/2001. The new Waste Act brought Czech waste legislation in line with the *acquis* by eliminating discrepancies with regard to definitions and by regulating issues that were not covered by the old Waste Act. The new Waste Act came into force on 1 January 2002 together with a number of implementing decrees defining selected waste streams, introducing obligations on hazardous waste and transposing the European waste list (EWL) into national law. The regulations on permits, record-keeping and reporting remained essentially the same. Changes that are relevant for waste statistics concern the introduction of the new waste classification and the transfer of competencies from district to regional level as a result of the administrative reform.

Permits and licences

Article 14(1) of the new Waste Act stipulates that waste recovery, disposal, collection and purchase facilities may only be operated based on the approval of the facility and the rules of operation by the regional authorities. This obligation does not apply to production facilities that are using waste that meets the requirements of raw materials (Article 14(2)). In the old Waste Act, the responsibility for approval of waste recovery and disposal facilities rested with the district offices.

Waste producers that handle hazardous waste need an approval by the competent district office, unless their activities are covered by an approval of the regional authority to operate a facility pursuant to Article 14 (see above) (Article 16 (3)).

Record-keeping and reporting

Record-keeping and reporting obligations for waste generators and operators handling waste was introduced into Czech waste legislation with the Act on Waste No 125/1997 (Part 5, § 20) and came into effect on 1 January 1998. Since 1 January 2002, these issues have been regulated in Part 6, Section 39 of the new Waste Act No 185/2001.

The Waste Act stipulates that waste generators and persons authorised to manage waste have to keep records on their wastes and on the methods of waste management. Records must be kept separately for each management unit.

Producers of waste and licensed persons producing or managing more than 50 kg of hazardous waste or more than 50 tonnes of other waste per year, are obliged to submit annual reports to the respective district office. They have to list type and quantity of waste, waste management methods and, as far as waste management companies are concerned, give information about the waste generators. The reports have to be submitted to the competent district office by 15 February of the following year. Based on these reports the district office has to keep records on waste and waste management, waste facilities, facilities for the use of secondary raw materials, waste collection and storage locations which have to be sent to the Ministry each year by 30 April.

The sender and the receiver of the waste have to fill out a hazardous waste identification form for the shipment of hazardous waste. The sender is obliged to send the identification form to the respective district office responsible for the starting point of the transport. After reception of the hazardous waste, the

receiver has to send the identification form back to the sender and to the district offices responsible for the starting and destination point of the transport.

Classification

Before 1998, waste statistics were based on a national classification in place since 1991 that distinguished three waste categories, namely non-hazardous waste, hazardous waste and special waste. Until 1998, statistics included only data on hazardous and on special waste.

With effect from 1 January 1998 the Waste Act No 125/1997 and the new catalogue of waste types (Regulation No 337/1997) came into force. This national catalogue is basically harmonised with the European waste catalogue (EWC) and the hazardous waste list (HWL). Differences exist with regard to the classification of hazardous waste which is stricter in the national catalogue. While the European hazardous waste list contains 236 waste types the Czech catalogue classifies 388 types of waste as hazardous.

The European waste list (EWL) was transposed into Czech law with the Waste Act No 185/2001 with effect from 1 January 2002. Hence, the first data collection according to the European waste list will take place in 2003 with 2002 as the reference year.

Institutional framework

The **Ministry of the Environment** (MoE) is the central public administration in the waste management sector and executes supreme State supervision in this field. The individual tasks of the MoE are fixed in Section 72 of the Waste Act No 185/2001. The MoE executes the function of a Basel Convention focal point and is the competent body for the import, export and transit of waste. It has to keep and process summary records on waste types and quantities, methods of waste management and waste management facilities and to make these reports available to the public. It has to draw up the waste management plan of the Czech Republic and takes decisions in cases, when an unambiguous classification pursuant to the waste classification is impracticable.

The **14 regional authorities** are part of the Ministry of the Environment. They were created in the course of the administrative reform that came into force in 2001. The regions approve the operation of facilities, draw up and keep records of the issued approvals and control the compliance of legal entities and natural persons and municipalities with legal obligations. They draw up regional waste management plans and perform changes thereof (see Waste Act No 185/2001, Section 78).

The **district offices** of the 76 districts have to keep and compile the waste records handed over to them by companies under the reporting obligation. They issue the approval for waste generators handling hazardous waste. They control compliance with legal regulations and may ban production activities of waste generators and operation of disposal facilities if these should fail to comply with legal regulations.

The **Czech Environmental Institute (CEU)** is one of the grant service organisations of the Ministry of the Environment. The task of the CEU is to provide information and expertise in the field of environmental protection for local government and to give support in the field of implementation of the acquis in waste management. The CEU also deals with the information system on waste (ISO) and is the Czech national focal point to the European Environment Agency and to the EIONET. So far, the work on waste issues has been managed by a small team within the Environmental Institute. To strengthen administrative capacity in this field the **Centre for Waste Management (CWM)** was founded in autumn 2001 and is currently involved in the framework of a twinning project between the Czech Ministry of the Environment and Austria, Italy and France. The Centre shall support the development and implementation of waste management plans at the regional and district level and to manage the waste information system. It shall also be responsible for tasks related to the handling of hazardous waste (e.g. licensing) and the shipment of waste. The CWM is planning to build an administrative unit with about 50 to 100 employees as an independent section of the Czech Water Research Institute (WRIM). The Water Research Institute is part of the Environmental Institute [3], [4].

The **Czech Statistical Office (CSO)** has carried out annual waste surveys since 1992 and reports data to Eurostat and the OECD. The CSO's survey is based on the Statistics Act No 85/1995 and on the programme of statistical surveys. The programme on statistical surveys is agreed upon once a year by the Czech Parliament. The programme has to be published before the beginning of every year.

Waste information collection

In the Czech Republic, data on hazardous and industrial waste are collected in parallel by the environmental administration and by the Statistical Office.

Administrative data

As described above, waste generators and persons managing waste in an amount exceeding the thresholds set by law are obliged to send annual reports to the respective district offices. After verification, the district offices submit the records to the Ministry that hands them over to the Czech Environmental Institute (CEU). The CEU feeds the data into their waste information system (ISO) and processes them. Data from the ISO are handed over to the Czech Statistical Office for the statistical yearbooks and are published in the regular reports on the state of the environment in the Czech Republic.

Statistical data

The Czech Statistical Office (CSO) has conducted regular statistical surveys on waste since 1992. Until 1997 the survey focused on hazardous and so-called special waste. Since 1998, the data refer to the Czech catalogue of waste types and cover all waste types.

The survey includes waste generators, waste management companies and waste treatment and disposal installations using one standard questionnaire (ODP 5-01). The selection of reporting units is done on the basis of the CSO's business register. The survey covers the economic sectors listed in Table 2.5. Small companies are exempt from the survey if:

- they have less than a certain number of employees. The threshold depends on their economic activity (see Table 2.5);
- they do not generate more than 50 kg of hazardous waste or more than 50 tonnes of non-hazardous waste per year.

Persons who are entitled to treat or dispose of waste are obliged

to answer the questionnaire irrespective of the company's size or the amount of waste managed.

Table 2.5

Economic activities and size of enterprises covered by the waste survey of the Czech Statistical Office

Threshold for size of companies	NACE codes covered
Enterprises with 20 employees or more	01, 02, 10–36, 40, 41, 45, 50.2, 55, 60.1, 60.2, 62, 64.2, 74.7, 74.81, 85.1, 85.2, 92.11, 93 [(a)]
Enterprises with 5 employees or more	37, 51.57 [(b)]
Enterprises irrespective of number of employees	90 [(c)]

(a) The designation of NACE sections is shown in the annex.
(b) 37 Recycling; 51.57 Wholesale of waste and scrap.
(c) 90 Sewage and refuse disposal, sanitation and similar activities.

About 400 enterprises (glassworks, steelworks, construction enterprises, etc.) are provided with an annex to the questionnaire asking for information on the use of secondary raw materials in their production process. In addition, the standard questionnaire contains questions on the companies' costs for hazardous and non-hazardous waste management.

Altogether, the CSO addresses about 15 000 companies of which 12 000 usually respond. The returned questionnaires are checked and processed. Quality control consists of logical checks on different levels of the data processing. The Statistical Office does offer the possibility of electronic reporting to companies. However, this possibility is limited due to technical reasons. Data are published in the statistical yearbook and special statistical publications.

Data on waste management

The established data collection system enables the Czech Statistical Office to comply to a large extent with the requirements of the joint questionnaire and to provide a rather comprehensive data set. The latest data submitted to Eurostat with the 2002 joint questionnaire [7] and presented below refer to the year 2001. Additional information is taken form the 'Report on the environment in the Czech Republic in 2000' [5] which is based mainly on the administrative data evaluated by Czech Environmental Institute.

Waste generation

Industrial waste

In 2001, the Czech Republic generated a total of 45.5 million tonnes of waste. Thereof, 34.1 million tonnes or 75 % were industrial waste, 8.6 million tonnes (19 %) agricultural waste and 2.8 million tonnes (6 %) municipal waste. The reported industrial waste total includes the quantities which are internally recovered by the waste generators.

Figure 1 shows the development of the generated industrial waste, including hazardous waste, in the period between 1995 and 2001. A look at the years since 1998 shows a reduction in the industrial waste amounts from 1998 to 1999 and a subsequent yearly increase until 2001. From 1998 to 1999, waste generation fell particularly in the manufacturing industry (mainly in the food industry, the basic metals industry and the chemical industry). Construction waste increased constantly from 1998 to 2001, whereas the amount of waste from mining and quarrying activities remained constant during the same period.

Comparison of developments in recent years and the time period from 1995 to 1997 is hindered by the introduction of reporting requirements and a new waste classification in 1998. The resulting break is clearly visible in the graph.

More detailed data on the share of economic sectors in waste generation are shown in Figure 2.5. Nearly 80 % of the industrial waste total is generated by three economic sectors, namely manufacturing industry (29 %), energy production (28 %) and the construction sector (22 %). Within manufacturing industry, the metal industry and the food sector are the most significant waste generators.

With an amount of 3.3 tonnes per inhabitant and year, industrial waste generation in the Czech Republic is quite similar to Poland (3.2 tonnes per capita), but higher than in most other candidate countries. In particular, the quantities of construction waste and waste from energy production exceed the respective amounts of most candidate countries considerably.

Hazardous waste

The generation of hazardous waste, which is shown in Figure 2.6, indicates basically the same trend as the industrial waste generation. A sharp decrease from 1998 to 1999 is followed by a subsequent growth of waste quantities. This development is mainly due to fluctuations of hazardous waste from energy production. The hazardous waste generation is clearly dominated by the manufacturing sector which accounts for nearly 60 % of all hazardous waste. The main generating sectors within manufacturing industry are the metal industry and the chemical industry.

In 2001, the hazardous waste total in the Czech Republic amounted to 2.8 million tonnes or 276 kg per capita and year. This figure lies clearly above the values of most other candidate countries. The high amount is at least partially attributed to the fact that the Czech waste classification that was applied until 2001 contains more waste types classified as hazardous than the European hazardous waste list [5]. Comparability with other countries will increase with the application of the European waste list starting with the reference year 2002.

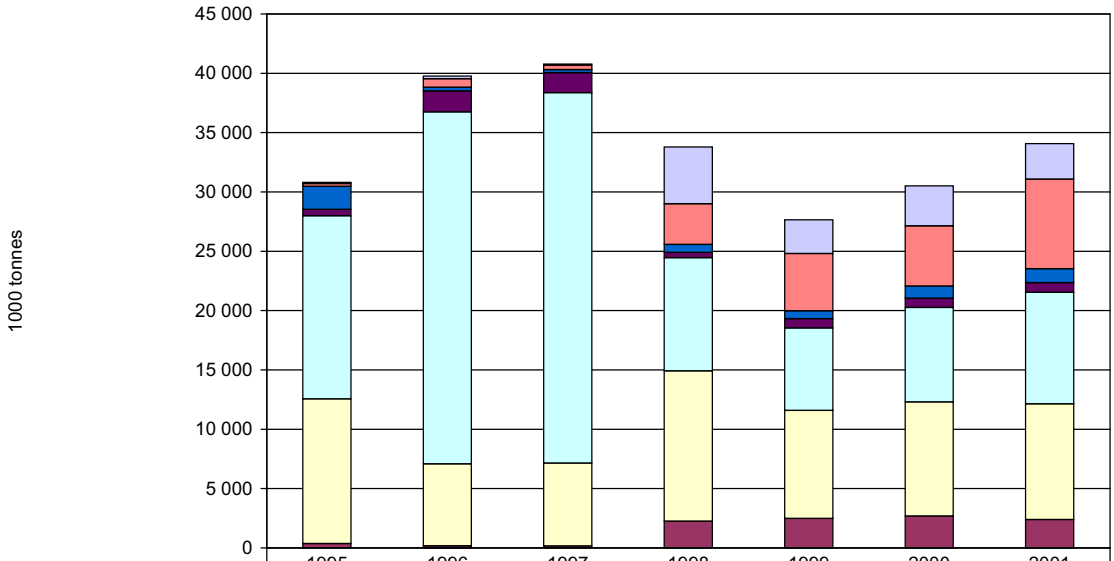
Waste treatment

Recovery

In the *State of the environment report 2002* the authors point out that recycling and use of waste as secondary material is increasing but is still low compared to more developed countries. The survey of the Statistical Office on the use of secondary raw materials in industry determines the amount of used materials at 2.7 million tonnes in 2001, which is an increase of 0.7 million tonnes compared to 2000. The main sources for recycling are iron-containing wastes, construction and demolition waste and glass waste [6]. There has also been an increase in the amount of power-plant ash used in the construction industry [5].

Figure 2.4

Development of industrial waste generation (including hazardous waste) in the Czech Republic [7]



	1995	1996	1997	1998	1999	2000	2001
Other sectors	108	234	96	4 783	2 841	3 373	2 994
Construction	233	718	367	3 421	4 835	5 083	7 565
Sewage and refuse disposal	1 934	299	269	676	659	1 023	1 167
Water supply	539	1 766	1 674	450	782	777	810
Energy production	15 439	29 675	31 214	9 537	6 945	7 967	9 398
Manufacturing industry	12 193	6 900	6 990	12 663	9 107	9 618	9 758
Mining and quarrying	361	176	165	2 256	2 484	2 678	2 386

Figure 2.5

Breakdown of industrial waste generation (including hazardous waste) in the Czech Republic by sectors in 2001 [7]

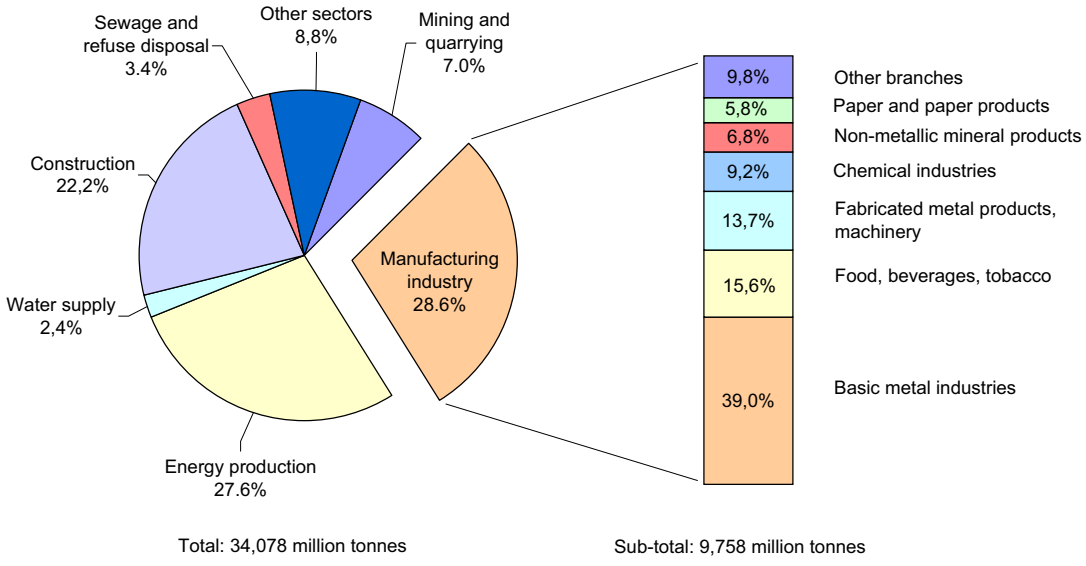
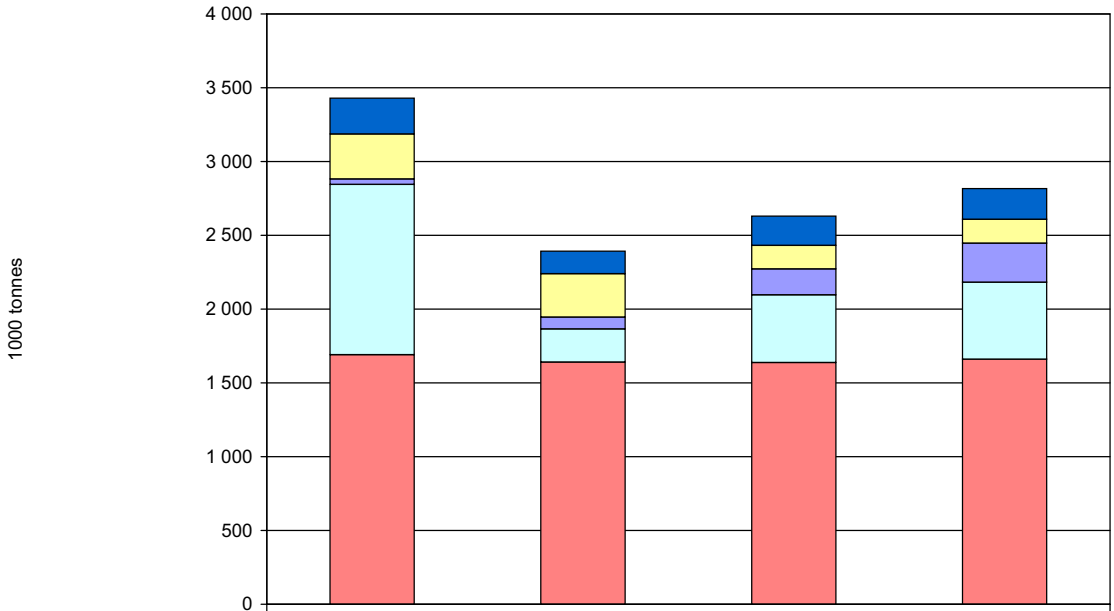


Figure 2.6

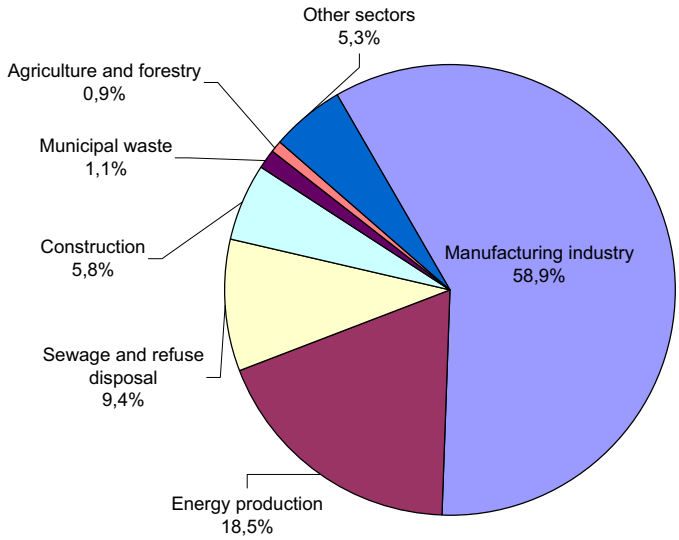
Development of hazardous waste generation in the Czech Republic [7]



	1998	1999	2000	2001
Other sectors	242	153	198	208
Construction	305	294	160	162
Sewage and refuse disposal	37	81	175	265
Energy production	1 154	224	459	522
Manufacturing industry	1 691	1 641	1 638	1 660

Figure 2.7

Breakdown of hazardous waste generation in the Czech Republic by sectors in 2001 [7]



Total: 2,817 million tonnes

However, the data on recycling of non-hazardous industrial waste reported to Eurostat and presented in publications of the CSO are difficult to interpret because of the parallel use of the terms 'recycling' and 'use of secondary raw material'. According

to the reported data, only 162 000 tonnes or 2 % of the 8.1 million tonnes of non-hazardous waste generated in the manufacturing industry are recycled (see Table 2.6). Not included in the table is a considerable amount of waste reported in the joint questionnaire under the category 'other recovery operations' and labelled as 'use of secondary raw material' in the respective comment. The distinction between these two terms is not clear.

Of the generated hazardous waste, about 1 million tonnes or 35.6 % are subject to recovery operations (see Table 2.7). The major part of the recovered amount is assigned to the recovery operations R7 to R11 (1).

Table 2.6

Treatment and disposal of non-hazardous waste from manufacturing industry in the Czech Republic in 2001 [7]

	1 000 tonnes	%
Total amounts generated by manufacturing industries (a)	8 098	100.0 %
of which designated for		
Recovery operations		
Recycling	162	2.0 %
Incineration with energy recovery	197	2.4 %
Disposal operations		
Incineration without energy recovery	69	0.9 %
Landfill total amounts	944	11.7 %
of which controlled landfill		

(a) The generated total does not necessarily equal the sum of the recovery and disposal operations.

Incineration and energy recovery

In the Czech Republic, incineration is very expensive compared to landfilling. Hence, only a small percentage of waste, mainly liquid wastes and high-caloric wastes are incinerated [5].

For municipal waste, there are at present three incinerators in operation with a total capacity of 646 000 tonnes per year (Brno: 240 000 tonnes, Prague-Malesice: 310 000 tonnes and Liberec: 96 000 tonnes) (see Table 2.8). The construction of further municipal waste incinerators is considered, especially in the Northern Moravian and Southern Bohemian regions [5].

Industrial waste incinerators are mainly employed for hazardous waste and health-care waste. In the joint questionnaire, the Czech Republic reports 75 incineration plants for hazardous waste with a capacity of 121 000 tonnes for the year 1999 (see Table 2.8). In four cement kilns, waste is used as fuel. In 1999 about 150 000 tonnes of plastic waste, waste oils, solvents and tars were energetically recovered in cement kilns [3], [5].

In spite of the considerable number of incineration plants, the share of waste incineration and energy recovery is still low. In 2001, a total amount 618 700 tonnes of non-hazardous industrial was incinerated of which 291 200 tonnes were energetically recovered and 327 500 tonnes were thermally treated [6].

The figures for non-hazardous waste from the manufacturing industry as reported in the joint questionnaire are shown in Table 2.6. Of the generated total of 8.1 million tonnes, 197 000 tonnes (2.4 %) were energetically recovered and 69 000 tonnes (0.9 %) were designated to thermal treatment.

The quantity of incinerated hazardous waste amounted to 51 000 tonnes or 2.1 % of the hazardous waste total. The major part (46 000 tonnes) was energetically recovered while 5 000 tonnes were thermally treated (see Table 2.7).

Table 2.7

Treatment and disposal of hazardous waste in the Czech Republic in 2001 [7]

	1 000 tonnes	%
Total amount generated (a)	2 817	100.0 %
Recovery operations total, of which	1 003	35.6 %
Incineration with energy recovery (R1)	46	1.6 %
Recycling, composting, etc. (R2-6)	60	2.1 %
Other recovery operations (R7-11)	897	31.8 %
Preparatory activities (R12-13)		
Disposal operations total, of which	1 371	48.7 %
Physico-chemical treatment (D9)	555	19.7 %
Biological treatment (D8)	269	9.5 %
Direct incineration without energy recovery (D10-11)	5	0.2 %
Landfill and other deposit into or onto land (D1-5)	394	14.0 %
Release into water bodies (D6-7)		
Permanent storage (D12)		
Preparatory activities (D13-15)	148 (b)	5.3 %

(a) The generated total does not necessarily equal the sum of recovery and disposal operations.
(b) Only temporary storage.

Landfilling

Landfilling is the most widely used method of waste disposal in the Czech Republic. In 1999, a total of 347 landfills were in operation of which 295 are designed for non-hazardous waste whereas 52 have facilities for disposal of hazardous waste (see Table 2.8). These landfills have permits for operation in accordance with the valid regulations. The overall capacity of landfills for non-hazardous and hazardous waste is assumed to be adequate for the present and the foreseeable future [5].

One of the major achievements in Czech waste management has been the restriction, since 1996, of land-filling to only those landfills which are provided with adequate technical measures. The first wave of closure and reclamation of old unsuitable landfills has been completed. Considerable difficulties are still associated with decontamination and reclamation of old landfills that were closed. So far, decontamination and reclaiming have been carried out on about 50 % of closed landfills. Faster progress is limited by the lack of financial means [5].

(1))The designation of R and D codes is shown in the annex.

Table 2.8

Waste treatment and disposal installations for hazardous and non-hazardous waste in the Czech Republic in 1999 [7]

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)	74	172	
Capacity (1 000 tonnes)	2 742	2 692	
Incineration plants			
Number (n)	3	75	
Capacity (1 000 tonnes)	646	121	
Landfill sites			
Number (n)	295	52	
Remaining capacity (1 000 tonnes)			
Permanent storage			
Number (n)			
Capacity (1 000 tonnes)			
Other			
Number (n)			
Capacity (1 000 tonnes)			

Import and export of waste

Import of waste into the Czech Republic for the purpose of disposal is prohibited by Waste Act No 185/2001. Accordingly, waste is imported only for the purpose of further use and processing. In 2000, imports of waste that was classified as hazardous according to the Czech classification amounted to 19 969 tonnes. Imports consisted mainly of ash from combustion of coal. In addition, aluminium skimming and lead batteries were imported.

Waste Act No 185/2001 does not allow the export of waste unless disposal within the Czech Republic should be impracticable. In this case waste may be exported to EU member countries or to member countries of the European Free Trade Association that are contracting parties to the Basel Convention. In 2000, this option was used for 3 768 tonnes of hazardous waste, namely for PCB-containing oils and equipment, aluminium skimmings, waste organic solvents and metal-containing ashes [5].

Institutions and contacts

Institution	Contact
Ministry of the Environment	www.env.cz
Czech Environmental Institute/ Centre for Waste Management	www.ceu.cz
Czech Statistical Office	www.czso.cz

Selected regulations

- Act No 125/1997 on waste, came into force with effect form 1 January 1998 (repealed by the Act mentioned below)
- Act No 185/2001 on waste and amendment of some other Acts, became effective on 1 January 2002 (except some sections)

References

[1] Country profile — Czech Republic', European Commission, Enlargement DG, http://europa.eu.int/comm/enlargement/czech/index.htm

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[5] Report on the environment in the Czech Republic in 2000', Ministry of the Environment of the Czech Republic (http://www.env.cebin.cz/publikace/3_zprava2000_e/aobsah_p.htm)

[6] *Generation, treatment utilisation and disposal of waste in 2001*, Czech Statistical Office

[7] Eurostat/OECD joint questionnaire (JQ) on waste

Hungary

Basic information

The Republic of Hungary covers an area of 93 036 km² and has a population of 10.2 million inhabitants. Approximately 1.8 million (18 %) inhabitants live in the capital Budapest. Hungary is administratively divided into 19 counties.

The economic structure of the country has changed considerably since the political transformation has taken place. The coal and steel industry collapsed, resulting in high unemployment in the north-eastern part of the country. The contribution of industry to GDP declined sharply in the first eight years after the end of communist rule. However, economic growth from the mid-1990s has been fuelled mainly by a revival of the manufacturing industry, as Hungary established itself as a component production base for EU-based supply chains. The share of agriculture in the economy has also shrunk significantly and accounts for less than 5 % of GDP. The service sector was neglected under communism, but since 1990 Hungary has rapidly become a service-based economy. Expansion in services compensated for the slowdown in industry in 2001, helping to sustain economic growth. In 2000 total services already accounted for around 62 % of GDP (up from about 40 % in the late 1980s) and 60 % of employment. The Hungarian economy has now been growing steadily for six years [1].

Table 2.9

Macroeconomic indicators for Hungary

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants) [(a)]	10 291	10 267	10 238	10 211	10 190
GDP at current prices (million euro)	40.4	41.9	45.1	50.6	58.0
GDP per capita at current prices (euro)	4 000	4 200	4 500	5 100	5 700
Change of GDP over previous year (%)	4.6	4.9	4.2	5.2	3.8
Structure of production(% of gross value added)					
Agriculture	5.9	5.5	4.9	4.3	.
Industry	28.1	28.2	27.7	28.7	.
Construction	4.6	4.6	4.7	4.6	.
Services	61.4	61.7	62.9	62.4	.

(a) Provisional figures.

Source: *[2]*

Waste legislation

The framework of waste management in Hungary is defined by Act XLIII of 2000 on Waste Management. It will be referred to subsequently as the Waste Management Act. The Waste Management Act has been in force since 1 January 2001. It defines the principles of waste management and contains authorisation for the regulation of individual waste types, waste treatment activities and waste treatment facilities by government or ministerial decrees.

Permits and licenses

According to Article 14(2) of the Waste Management Act, waste treatment activities may be carried out exclusively with a permit from the environmental protection authority. The term 'waste treatment activities' covers collection, gathering, transportation, pre-processing, storage, recovery and disposal of waste. Permits are also required for imports and exports of hazardous waste. They are issued by the Chief Inspectorate.

Record-keeping and reporting obligations

Information requests are stipulated in Act XLIII of 2000 on Waste Management and in the government decree on waste statistics.

Hazardous waste

Public and private enterprises, including health care institutions (clinics, laboratories, etc.) have to be registered if they generate or handle more than 1 000 kg of hazardous waste per year. According to Article 32, Sections 3, 4 and 5 of the Waste Management Act the generators and collectors of hazardous waste have to document their activities and to supply the environmental protection authorities with data on the generation, collection, transportation, management, transfer and acceptance of hazardous waste. The supervising and data collecting administrative bodies are the 12 regional environmental inspectorates and the Institute for Environmental Management.

In addition, generators of hazardous waste have to draw up a waste management plan for a period of at least three years.

Non-hazardous industrial waste

According to Article 51(1) of the Waste Management Act, producers, holders and operators of waste have to keep records on waste amounts and composition and on the treatments carried out. All the information has to be reported to the regional environmental inspectorates. The content of the records is provided for in a separate legal rule. On the basis of these reports national data on waste are produced.

Waste classification

Until the reporting year 1999, Hungary used a national waste classification that was fairly identical with the former German LAGA classification. Since 1999, Hungary has applied a classification that is based on a European waste catalogue (EWC) and the hazardous waste list (HWL) in combination with a national classification, the so-called B-list. In the B-list, some types of wastes are classified hazardous that are regarded as non-hazardous in the EWC. The European waste list (EWL) was transposed into Hungarian legislation by the ministerial decree on the list of wastes (16/2001) that entered into force in January 2002.

Institutional framework

The **Ministry of the Environment** formulates the waste management policy. In case this policy affects economic issues like batteries and accumulators, packaging, waste oils and PCB, the Ministry of Economic Affairs is responsible for its implementation. The Ministry of the Environment is establishing national data-aggregates concerning hazardous waste by utilising the database of the hazardous waste information system (HAWIS). In addition, the Ministry is reporting to the Basel Secretariat on transfrontier movements of hazardous wastes.

The 12 **regional environmental inspectorates (REIs)** are subordinated to the Ministry of the Environment and responsible for the licensing, inspection and implementation of waste management. They issue permits for the handling of hazardous waste and collect data on the management of hazardous waste. Another important task is the monitoring of waste disposal sites. The inspectorates have their own laboratories, which are all accredited. They have the power to impose fines and close facilities.

The **Institute for Environmental Management** is subordinated to the Ministry of the Environment. The Institute manages HAWIS. It receives the waste reports of obligated parties from the regional environmental inspectorates and processes them.

Waste information collection

The Hungarian waste information system is currently in a phase of transition. At present, data collection is divided between several institutions depending on the type of waste as follows:

Ministry for the Environment and Water:	Hazardous waste (including hazardous health care waste and agricultural waste)
Ministry for Economic Affairs:	Non-hazardous industrial waste
Statistical Office:	Municipal waste
Ministry of Health:	Health care waste
Ministry of Agriculture:	Agricultural waste

Due to this distribution of responsibilities, different data collection and information systems are in place for specific waste types. The systems are only partially harmonised with one another and are in some cases incomplete [3].

Hazardous waste

Data on hazardous waste are collected by the 12 regional environmental inspectorates together with the Institute for Environmental Management that runs HAWIS. Data collection is based on self-declaration of the obligated enterprises, i.e. enterprises generating or handling more than 1 000 tonnes of hazardous waste per year. The required registration forms are available in shops. Obligated generators and collectors have to report annually. The deadline for submission of registration forms is 1 March. Waste management operators have to report quarterly on the eighth day following the quarter. Altogether, the inspectorates receive about 15 000 reports per year.

Data are collected annually since 1996. The survey covers all hazardous waste, including hazardous waste from health care and agriculture. Data are collected and checked by the inspectorates. Processing and aggregation is done in the IT department of the Institute for Environmental Management.

Non-hazardous industrial waste

The survey on non-hazardous industrial waste is carried out under the responsibility of the Ministry for Economic Affairs by a consulting company. Since 1996, the survey has been based on the reports of waste generators with more than 10 employees. For the energy production and water supply sectors no such threshold exists.

Until 2001, the data were collected according to the name of the wastes, no consequent coding was applied. The coverage of the survey is assumed to be poor. Estimates say that about 10 % of the generators are covered. Questionnaires are sent out three months prior to their return deadline, which is 30 June.

Outlook

The complex system of data collection leads to the overlapping of surveys on the one hand and to data gaps on the other hand. In addition, the surveys are not harmonised and lack compatibility. In order to create a uniform and complete system, the development of a comprehensive waste management information system was the subject of a Phare twinning project. The project aimed, *inter alia*, at the establishment of an EU-conforming waste management information flow.

The key element of the future concept will be a 'central environmental body' dealing with the waste data for all types of waste. The 'central body' will collect data either directly or receive them from the regional environmental inspectorates and the Ministry of Health (data on health care wastes). The central body will process the data and report them to the ministries and municipalities and will make them available to the public via the Internet.

Data will be collected from:

- waste collectors and operators of treatment facilities directly by the central body;
- waste generating companies and municipalities by the regional environmental inspectorates;
- medical institutions and doctors by the Ministry of Health.

The business register of the Central Statistical Office and the database on treatment and disposal facilities that is available at the Ministry of the Environment, will act as a basis for the selection of reporting units.

The legal basis for the new system will be laid down in a separate regulation, the government decree on waste management reporting, which is currently under preparation. As regards waste generation, companies which exceed certain thresholds will be addressed by questionnaires. It is estimated that about 900 000 companies will have to report. For small and medium-sized companies falling below the thresholds an additional sample survey will be carried out.

No thresholds will apply to waste treatment and disposal facilities but all operators will be obliged to report. Treatment facilities for hazardous waste will have to report quarterly, facilities dealing with non-hazardous waste annually.

The first data collection according to the new system is due to be carried out in 2004 with the data referring to 2003. However, this will depend on whether the new database system, which is planned to be operational at the end of 2003, is up and running. The new system is expected to provide a complete and consistent set of information that will meet the information needs of ministries, inspectorates and municipalities which in turn will facilitate reporting according to the EU waste statistic regulation and other EU directives.

Data on waste management

Waste generation

Industrial waste

Hungary has carried out regular surveys on industrial waste generation according to economic sectors for a long time. However, the data reported to Eurostat in the joint questionnaire [4], which are shown in Figure 2.8 and Figure 2.9, show some gaps and shortcomings. This is reflected by the fact that Hungary has difficulties in determining the total amount of generated waste. In recent years, Hungary either did not report on the generated total or gave estimates that lay much higher than the sum of the waste from the different economic sectors covered by the survey.

It was indicated in the previous section that the survey on industrial waste has an inadequate coverage which leads to underestimates. This assumption is supported by comparison with other countries. From 1997 to 2000, the quantities of industrial waste

were around 10 million tonnes. The resulting per capita amount of 974 kg for the year 2000 is considerably lower than the figures for most other candidate countries.

For the development of the national waste management plan (NWMP) [3] that is currently under preparation, the Ministry of the Environment proceeds from higher figures. Generation of non-hazardous industrial waste in 2000 is supposed to amount to about 21.5 million tonnes, which is more than double the quantity than from the regular survey.

The largest waste generating sectors are the energy production, the mining and quarrying sector and the manufacturing industry, particularly the metallurgical sector (see Figure 2.9). Slag from power stations and metallurgical plants, mining refuse, industrial waste water sludge and sludge from water treatment make up nearly 90 % of the industrial waste.

Both the data reported to Eurostat and the figures cited in the draft NWMP indicate a decrease of industrial waste during the 1990s. The NWMP reports a decline from 34.6 million tonnes in 1990 to 21.5 million tonnes in 2000.

Hazardous waste generation

For the discussion of data on hazardous waste the underlying waste classifications have to be considered. The hazardous waste total that Hungary reports to Eurostat refers to the Basel definition covering the codes Y1 to Y47. These quantities are shown in Figure 2.10. For national statistics Hungary has used the LAGA catalogue (and later on the EWC) in combination with a national classification that has a wider definition of hazardous waste. As a result, the hazardous waste amounts based on the national definition are about three to four times higher than those based on the Basel definition. The data on hazardous waste generation reported to Eurostat are not specified by economic sectors.

In 2000, the generated total of hazardous waste according to the Basel definition amounted to 951 000 tonnes, corresponding to 93 kg per capita. According to the hazardous waste information system (HAWIS) the national classification resulted in a total quantity of 3.393 million tonnes of hazardous waste in the same year. One quarter of the waste produced (0.835 million tonnes) is made up of red mud originating from alumina production. Nearly 1.5 million tonnes of hazardous waste come from the manufacturing industry. Within it, the largest amounts are metallurgical and metal finishing slags and sludges, and wastes resulting from the processing and use of petroleum products. Combustion residues from power stations and incinerators account for another 1 million tonnes [3].

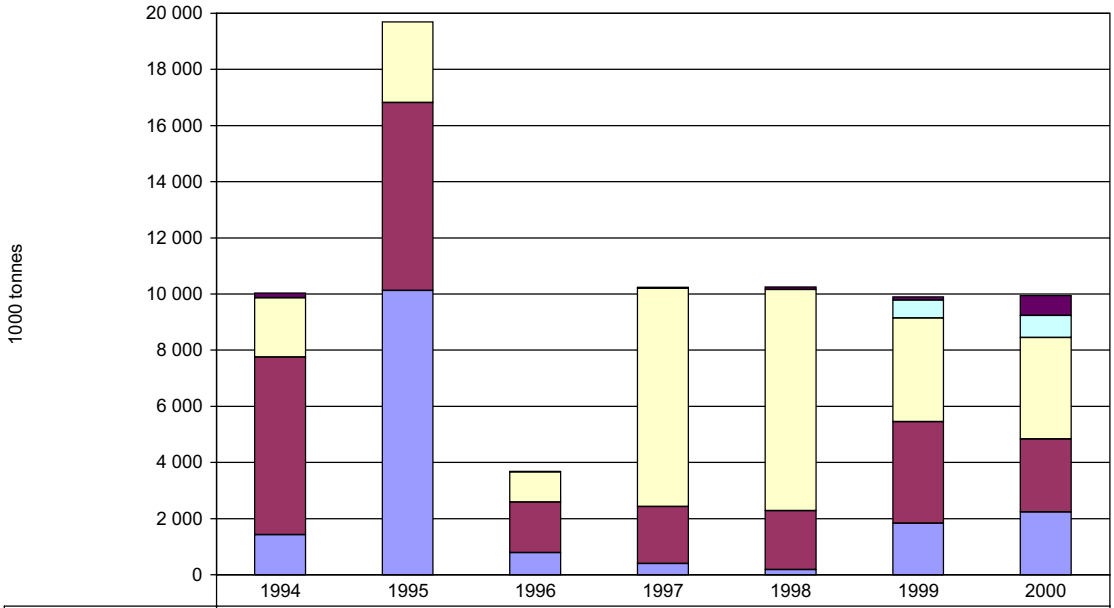
It is assumed that the application of the European waste list starting in 2002 will yield an amount of about 1.1 million tonnes of hazardous waste, not including red mud form alumina production [3].

Waste treatment and disposal

The Hungarian data collection system provides insufficient information on the destination of waste and on the available treatment and disposal facilities. Data are particularly poor for hazardous waste. Hungary fails completely to report on the treatment and disposal of hazardous waste as well as on the infrastructure. In the following, the draft national waste management plan was consulted to provide additional information.

Figure 2.8

Development of industrial waste generation in Hungary **[4]**



	1994	1995	1996	1997	1998	1999	2000
Other sectors			10	15	10		
Construction	170		5	21	81	113	707
Water supply						644	790
Energy production	2 108	2 878	1 080	7 780	7 884	3 685	3 612
Manufacturing industry	6 328	6 692	1 795	2 022	2 099	3 618	2 605
Mining and quarrying	1 428	10 123	790	404	182	1 838	2 233

Figure 2.9

Breakdown of industrial waste generation in Hungary by sectors in 2000 **[4]**

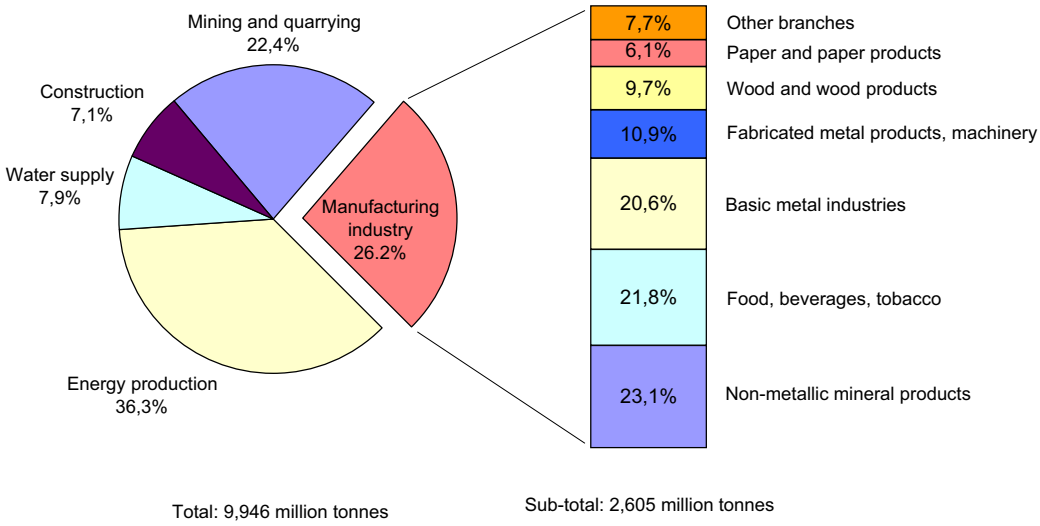
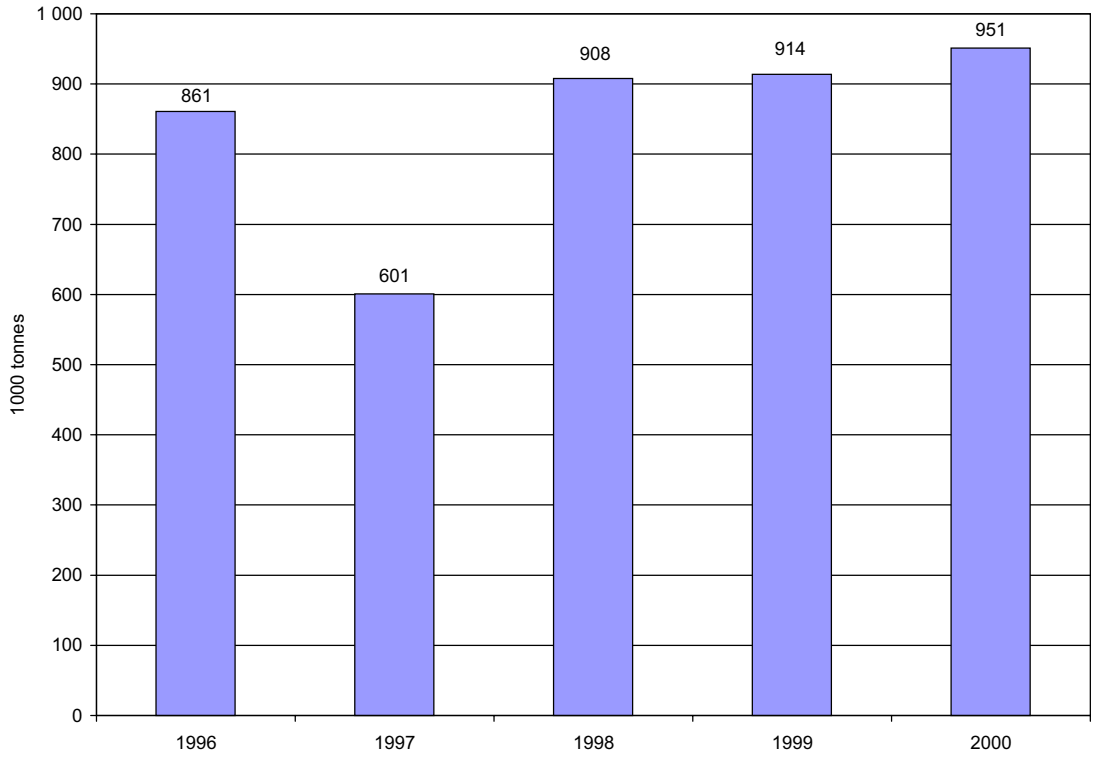


Figure 2.10

Development of hazardous waste generation in Hungary **[4]**



Recovery

The authors of the draft NWMP state that recovery of industrial waste in general is low when compared to international levels. The recovery rate is assumed to be below 30 % for non-hazardous industrial waste and below 20 % for hazardous waste. A higher recovery rate of 76 % is reported for non-hazardous waste from the manufacturing industry (see Figure 2.9). According to the data reported to Eurostat, 70 % of the total of 2.6 million tonnes were recycled and 6 % energetically recovered in 2000.

The NWMP declares promotion of recycling an important target. Increased efforts should be made to use non-hazardous slag and fly-ash from power stations and slag from metallurgical plants in the building industry and in road construction.

Table 2.10

Generation, treatment and disposal of non-hazardous industrial waste in Hungary in 2000 [4]

	1 000 tonnes	%
Total amounts generated in manufacturing industries [(a)] of which designated for	2 605	100.0%
Recovery operations		
Recycling	1 832	70.3 %
Incineration with energy recovery	149	5.7 %
Disposal operations		
Incineration without energy recovery	< 1	< 0.1 %
Landfill total amounts		
of which controlled landfill	345	13.3 %

(a) The generated total does not necessarily equal the sum of recovery and disposal operations.

Incineration

Hungary operates one incineration plant for municipal waste in Budapest with a capacity of 353 000 tonnes per year. The plant disposes of more than half of the municipal waste of Budapest. Incineration rates for non-hazardous industrial waste are low. According to the Eurostat data only some 360 tonnes of waste form the manufacturing industry were incinerated in 2000.

For the thermal treatment of hazardous waste an incineration capacity of about 85 000 tonnes per year is established. Nearly one third of the capacity is made up of low capacity hospital incinerators and facilities burning spent oil. However, some smaller incinerators do not meet the required emission standards. They will have to be modernised or closed down by 2005. Hungary has been granted transitional arrangements with regard to the *acquis* on the incineration of hazardous waste until 31 December 2005. For 2008, a required treatment capacity for hazardous waste of 170 000 tonnes is forecast. Thus, the construction of new incinerators is needed [3].

Landfilling

The predominant treatment option for the generated waste is landfilling. About 60 % of industrial waste and 75 % of hazardous waste are going to landfills. Waste from power stations, metallurgical plants and mines that are produced in large quantities, are landfilled mainly at the production site or in refuse dumps established in the vicinity. Non-hazardous industrial waste is also disposed of together with municipal waste in one of the 665 registered municipal waste landfills. Only about 15 % of these landfills can be considered as specially engineered landfills. In addition to these, however, about 620 illegal landfills of mainly low capacity are in use. According to the draft NWMP, industrial landfills that were not constructed as required, should be closed or substituted by 2009 [3].

Table 2.11

***Waste treatment and disposal installations for hazardous and non-hazardous wastes in Hungary in 2001* [4]**

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)			
Capacity (1 000 tonnes)			
Incineration plants			
Number (n)	1		
Capacity (1 000 tonnes)	353		
Landfill sites			
Number (n)	665		
Remaining capacity (1 000 tonnes)	15 389		
Permanent storage			
Number (n)			
Capacity (1 000 tonnes)			
Other			
Number (n)			
Capacity (1 000 tonnes)			

Institutions and contacts

Institution	Contact
Environmental Statistics Department of the Hungarian Central Statistical Office (HCSO)	www.ksh.hu
Ministry of the Environment	www.ktm.hu
Institute for Environmental Management	

Selected regulations

- Act XLIII on Waste Management, 2000
- Government decree on waste statistics
- 3/2001 government decree on incineration of waste
- 98/2001 government decree on hazardous waste
- 22/2001 decree of Minister on the landfill of waste
- 50/2001 government decree on agricultural use of sludge
- 16/2001 decree of Minister on list of waste

- 1/2001 decree of Minister on health care waste
- Government decree on waste management reporting (proposal)

References

[1] http://www.economist.com/countries/Hungary/

[2] *2002 Regular report on Hungary's progress towards accession*, European Commission, October 2002

[3] National waste management plan 2003–08 (draft), November 2002

[4] Eurostat/OECD joint questionnaire (JQ) on waste

Estonia

Basic information

Estonia is the smallest of the Baltic States and has a population of 1.36 million inhabitants. Over 70 % of the population is concentrated in urban areas. The capital Tallinn with its surroundings has more than 550 000 inhabitants and produces over 60 % of the country's gross domestic product. Administratively, Estonia is divided into 15 counties that are subdivided into 241 self-governing municipalities. Since 1993, the country has had a negative net population growth, due mainly to the emigration of Russian-speaking residents. As a result the total population diminished by 8 % between 1993 and 1999 [1].

In the process of regaining independence Estonia faced a severe adjustment shock. In 1992, manufacturing and trade output fell sharply and a structural crisis began. Since 1995, the export trade has recovered and the industrial production has steadily risen. The new economic situation has changed the nature of productive activity and increased the importance of the service sector. In 1998, the main industrial production came from the food industry (24.5 %), the metal and machinery industry (16 %) and the wood, paper and furniture industry (16 %) [1].

Estonia has the largest accessible oil shale deposits in the world. Although oil shale production has almost halved since 1990, the current exploitation amounts to 10 million tonnes annually. At present almost 100 % of Estonia's electric power is produced from oil shale [1].

Table 2.12

Macroeconomic indicators in Estonia

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	1 400	1 386	1 376	1 370	1 364
GDP at current prices (million euro)	4.1	4.7	4.9	5.6	6.2
GDP per capita at current prices (euro)	2 900	3 400	3 600	4 100	4 500
Change of GDP over previous year (%)	9.8	4.6	– 0.6	7.1	5.0
Structure of production(% of gross value added)					
Agriculture	7.9	7.2	6.7	6.1	5.8
Industry	23.0	22.6	21.1	22.4	22.8
Construction	6.3	6.7	6.0	6.1	5.9
Services	62.8	63.5	66.2	65.4	65.5

Source: *[1]*

Waste legislation

The EU framework directives on waste (75/442/EEC) and on hazardous waste (91/689/EEC), and the key policy instruments such as the waste management plan have been incorporated into the Waste Act, which came into force on 1 December 1998. Various EU directives concerning certain types of waste or waste management have been included in specific national regulations.

Permits and licenses

According to Chapter 6 of the Waste Act a permit is required for the disposal of waste, the recovery of waste, the collection and transport of hazardous waste (save for the collection of hazardous waste generated in households), and for the transport of non-hazardous waste. Applicants for waste permits to provide hazardous waste services need a hazardous waste handling licence.

A waste permit is also required for waste generators belonging to selected economic activities [(1)] with environmentally relevant wastes. This applies to those branches that need an 'integrated environmental permit' according to the Estonian Act on Integrated Pollution Prevention and Control.

Waste permits are issued by the county environmental authorities, and the Ministry of the Environment gives hazardous waste handling licenses. Information on permits and licenses shall be kept in the State environmental register which is currently under development. All information on environmental (including waste) permits and licenses is available to the public through an Internet-based information system on environmental permits.

Record-keeping and reporting

Chapter 7 of the Waste Act stipulates record-keeping and reporting obligations for any person who holds a waste permit and for producers of hazardous wastes. Records have to be kept on type, quantity, and properties of generated waste, on collection, storage, recovery and disposal. Reports have to be submit-

(1) Energy and fuel processing industry; metal production and processing; mineral materials production and processing; chemical industry; timber, pulp and paper industry; animal husbandry and food industry; mining and enrichment of mineral resources; tanning and processing of leather, textiles and fibre; surface treatment and finishing by using organic solvents; storage of hazardous chemical, including fuel.

ted at least once a year. The reporting obligation was included in the Waste Act in 1999 and entered into force on 1 January 2000. The form and frequency of the reports and other details of waste reporting are dealt with in the regulation on the waste report form and submission procedure that came into effect in January 2002.

The delivery of hazardous waste has to be accompanied by consignment notes. A consignment note contains information concerning holder, producer, transporter or receiver of the waste and also concerning the type and main characteristics of the hazardous waste. It has to be prepared by the person who delivers the waste and must be submitted to the receiver with every consignment of waste. The format and the procedure for preparation, processing and registration of consignment notes is established in a special regulation.

Waste classification

With the government regulation on the approval of the lists of waste categories, waste types and hazardous waste from 24 November 1998 Estonia has implemented the European waste catalogue and the hazardous waste list. The harmonised Estonian waste catalogue has been used since 1999 and replaced the material-oriented German LAGA-type classification system. For one year, 1999, data were collected according to both classifications. Data reported to Eurostat have been based on the Estonian waste catalogue since 2000.

A government regulation establishing the Estonian list of wastes, which was approved in June 2002, transposed the European waste list (Commission Decision 2000/532/EC) into national law. The Estonian list of waste has been used for reporting and data collection since the beginning of 2003 for the data concerning the year 2002.

Institutional framework

The **Ministry of the Environment (MoE)** is responsible for Estonian environmental policy, including waste management policy, and for environmental administration. According to the Environmental Register Act that came into effect on 1 January 2003, the Ministry is chief processor of the State environmental register. The environmental register will contain data on waste management as well as a list of waste management facilities designated for waste disposal. The implementation of the Register will be done step by step. Data on waste management facilities will be included from 1 July 2004, data on waste management from 1 July 2006.

The **Estonian Environmental Information Centre (EEIC)** is subordinated to the MoE. It is responsible for the collection and processing of environmental data and keeping databases on waste, air pollution as well as water use and pollution. The EEIC is the national focal point of the European Environmental Agency (EEA). The Estonian State environmental register is being established at the EEIC according to the time schedule stipulated in the Environmental Register Act.

The 15 **county environmental authorities (CEAs)** are subdivisions of the MoE. They issue waste permits for waste generators, collectors, transporters and waste treatment operators according to the regulations of the Waste Act. They collect and check waste data from obligated enterprises.

The **Statistical Office of Estonia** cooperates with the MoE and the EEIC in the field of waste data collection. The procedures are regulated in a contract between the Statistical Office and the MoE.

Waste information collection

The Estonian waste information collection is based on the reports of the companies that are subject to reporting obligations pursuant to the Waste Act. Accordingly, data are collected from holders of waste permits, i.e. waste collectors, transporters, treatment and disposal facilities, and waste generators of selected economic activities. Furthermore, the county environmental authorities (CEAs) may collect data from other enterprises that are not holding waste permits but are considered to be important waste generators.

Data collection is carried out by the CEAs using a questionnaire according to the regulation of the Minister of the Environment on the waste report form and submission procedure. The CEAs send out the questionnaires to the reporting units in the beginning of January. Returned waste reports (on average about 800 per year), are checked by the CEAs and handed over to the Estonian Environmental Information Centre (EEIC). The EEIC processes the data and prepares a publication containing aggregated data and other relevant information. The survey results are submitted to the Ministry of the Environment. The data are also given to the Statistical Office of Estonia, including the full amount of primary data. The Statistical Office compiles special outputs and publications.

Data checks are carried out by the CEAs and by the EEIC. Mass balances and some other features are checked automatically in the course of data entry. Additional checks by waste streams are carried out in the Statistical Office in the process of compiling various outputs.

Pilot project

In Estonia, data on waste generation are collected from enterprises that carry out certain economic activities, and from selected other companies that are considered to be important waste generators. Accordingly, the coverage of the survey is limited and does not provide complete information on industrial waste generation by economic sectors. Estonia carried out a pilot project to improve survey coverage and data quality, and to adapt the waste information collection to the requests of the European waste statistics regulation. The main objectives of the pilot project were:

- to identify waste generators that are not covered by waste reporting obligations and to estimate the waste amounts generated by these companies;
- to specify the waste generation by economic sectors; and
- to develop an estimation procedure for filling up data gaps.

The project focused on enterprises whose activities belong to the NACE divisions 10 to 36 (mining and quarrying industry, manufacturing industry). In the first step, the list of reporting companies was compared with the business register of the Statistical Office to identify the companies that submitted no waste reports. Subsequently, a special survey was carried out to determine types and amounts of waste generated by the identified companies. Based on the survey results, different methods for the estimation of missing data were developed and assessed with regard to their suitability. As a result, the total industrial waste generated by the investigated economic sectors was estimated.

Data on waste management

Waste generation

Industrial waste total

In Estonia, a total of 11.6 million tonnes of waste was generated in 2000. Some 95 % of this amount or 11.0 million tonnes respectively was industrial waste [(1)]. Municipal waste accounts for 0.6 million tonnes or 5 % of the generated total. As pointed out above, the data reported to Eurostat contain no specification of the origin of industrial waste according to economic sectors. Thus, additional information on types and origin of waste is taken from the OECD's environmental performance review [1] and the report of the EEIC on the state of the environment in Estonia [3].

With a per capita amount of about 8 tonnes, the industrial waste generation in Estonia exceeds the quantities of other candidate countries by far. The reason for this is the waste-intensive oil shale industry. Estonia has the largest accessible oil shale deposits in the world. and produces almost 100 % of its electric power from oil shale. Most of the industrial waste — about 9.4 million tonnes in 1999 — comes from oil shale related activities. Oil shale mining (underground and in quarries), oil shale based energy production and shale oil production in the chemical industry are the largest waste sources. The predominant waste types are mining waste, slag and fly ashes from power stations and semi-coke from oil shale processing (see Table 2.13). With about 6 tonnes of oil shale waste per capita and year, Estonia shows the highest waste generation from energy production in Europe [1]. In 1999, oil shale wastes accounted for 87 % of the total waste generated. Among other industrial branches, the Estonian construction industry, the wood processing and the food industry are the most important waste generators [3].

Table 2.13

Waste generation from mining, energy production and chemical processing of oil shale in 1 000 tonnes

	1995	1996	1997	1998	1999
Oil shale slags, fly ash and dust	5 714	5 933	5 819	5 193	4 963
Oil shale semi-coke, fuses (pitch waste)	1 227	1 293	1 374	931	631
Oil shale gangue, tailings	5 137	5 885	5 999	5 271	3 807
Oil shale waste total	12 078	13 111	13 192	11 395	9 401
of which hazardous waste	6 933	7 216	7 170	6 110	5 588

Source: *[3]*

Figure 2.11 shows the development of industrial waste generation since 1995. In the period from 1996 to 2000, industrial waste amounts were decreasing strongly, from 14.1 million tonnes in 1996 to 11 million tonnes in 2000. This development reflects the reduction of oil shale exploitation. Since 1990, the production of oil shale has nearly halved [1]. The volume of generated waste decreased accordingly (see Table 2.13).

Hazardous waste

Of the industrial waste total of 11 million tonnes, about 6 million tonnes are classified as hazardous waste. Thus, hazardous waste accounts for more than 50 % of the generated industrial waste total. Oil shale related industries produce about 94 to 98 % of this amount. Most oil shale wastes from energy production and chemical industry are considered hazardous due to their high alkalinity. In the former Estonian classification system these wastes were mainly classified as 'wastes of minor hazard'.

Following the reduction of oil shale exploitation, hazardous waste amounts decreased from 7.7 million tonnes in 1996 to 6.0 million tonnes in 2000. Another reason for the decrease of hazardous waste quantities is the restructuring of the economy and the accompanying alteration of production in several branches or the closure of production sites [3]. Hazardous waste generated outside the oil shale industry decreased from 0.34 million tonnes in 1995 to 0.27 million tonnes in 1999 [1].

Waste treatment and disposal

Non-hazardous industrial waste

Waste disposal in Estonia is still mainly based on landfilling. The number of landfills is considerable and uncontrolled landfills are frequent. In order to get an overview of the number and the actual condition of landfills, Estonia started in 1995 to build up a register of landfills. By March 1999, a total of 565 landfills (active or closed) has been registered of which 351 were landfills for municipal waste. The number of active landfills has decreased steadily in recent years. In 2000, a total number of 170 landfills (hazardous and non-hazardous waste) were in operation, including 144 landfills for non-hazardous waste, mainly for the disposal of municipal waste (see Table 2.15). After the enforcement of the Estonian landfill regulation the total number of operating landfills fell to 55 by 2002, of which 18 are internal landfills of industrial enterprises. The draft of the national waste management plan suggests that in future only 5 to 10 modern municipal landfills will be sufficient [1].

Estonia has no special incineration plants for municipal and non-hazardous waste. The incineration plants reported in the respective table of the joint questionnaire (see Table 2.15) are combustion plants that co-incinerate separated fractions of waste such as paper, cardboard and PE and PET plastics.

(1))In the OECD/Eurostat joint questionnaire Estonia reports data on the total amount of waste generated and on municipal waste arising. In the text, the difference of both figures is referred to as 'industrial waste'. The economic sectors that are covered by this figure are not specified. This has to be considered when comparing industrial waste generation in Estonia with other countries.

Figure 2.11

Development of waste generation (including hazardous waste) in Estonia

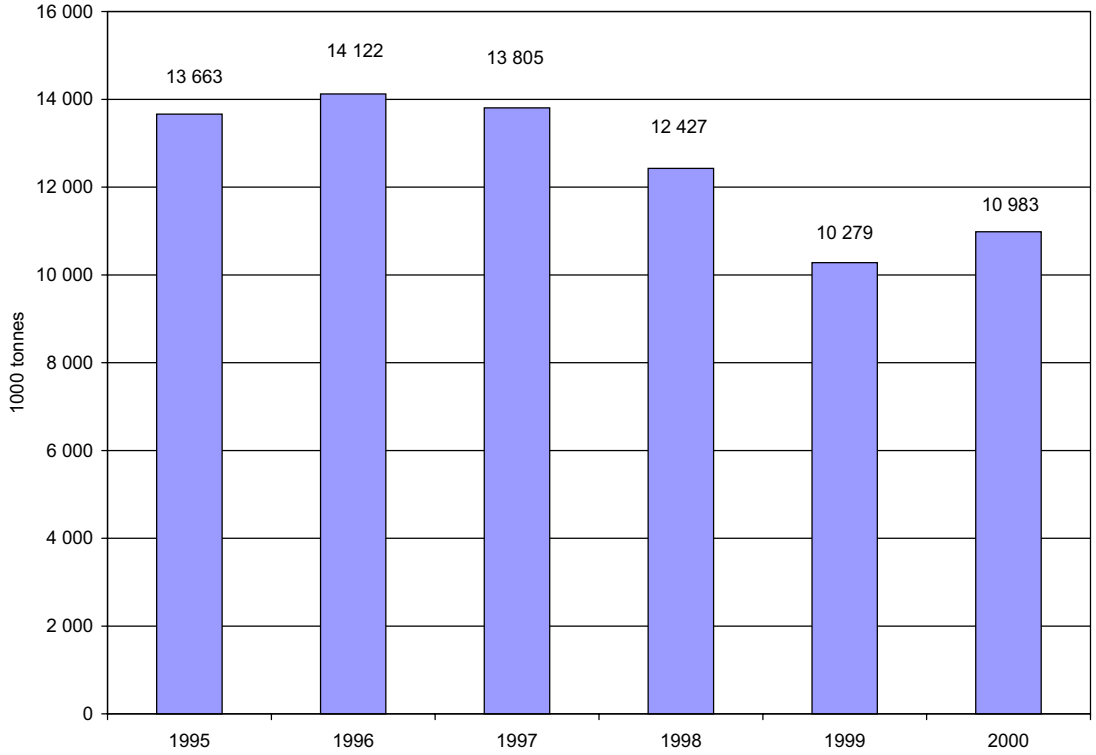
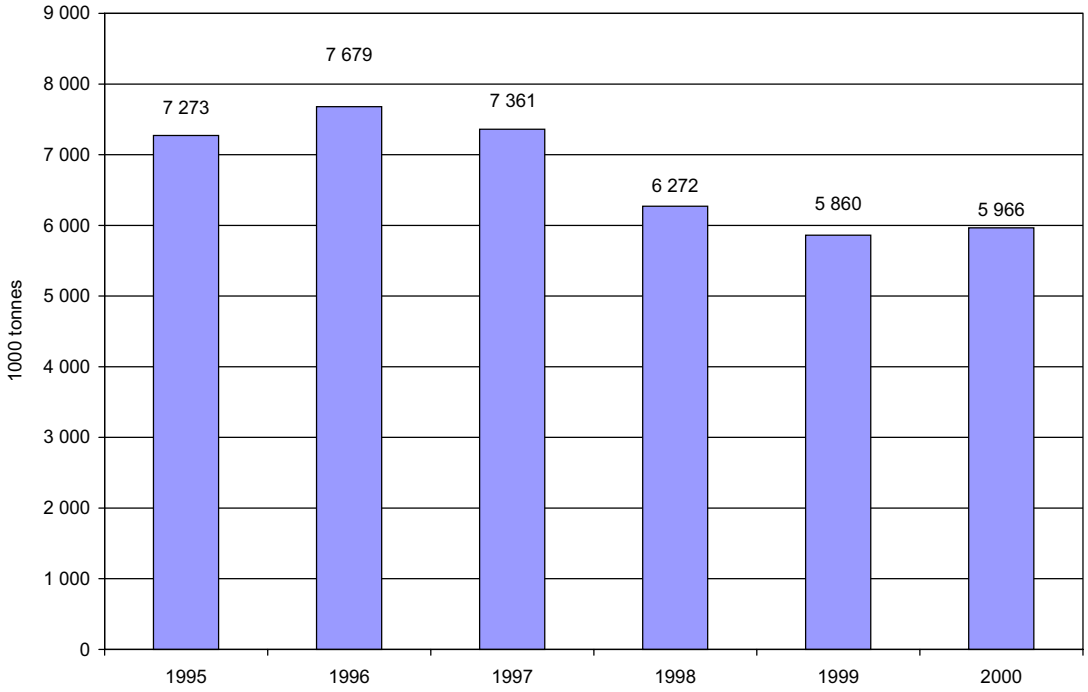


Figure 2.12

Development of hazardous waste generation in Estonia, in 1 000 tonnes



The Estonian environmental strategy specifies that by the year 2001 an overall recovery rate for waste of 50 % should be achieved. This target was clearly missed although recovery was increased in recent years. According to the Estonian Environ-

ment Information Centre, composting and use of waste for soil treatment (mainly manure, sludges from wastewater and combined sewerage, ashes, vegetable waste, etc.) and the use of waste for energy recovery (mainly wood waste) could be increased in the near future.

Hazardous waste

According to the 1998 Waste Act, the Ministry of the Environment is obliged to prepare a national development plan for hazardous waste management [(1)] and to organise the network of hazardous waste management facilities. The national waste management system for hazardous waste is still under development and not yet fully implemented. But compared to the situation in 1995 when Estonia was mainly co-depositing hazardous waste in municipal landfills that often did not comply with environmental requirements, the organisation of hazardous waste handling and disposal is much better organised.

Table 2.14 shows the joint questionnaire data on the treatment and disposal of hazardous waste in 2000. According to these data, the major part of hazardous waste (96.8 %) was disposed. Recovery is still low amounting to 141 000 tonnes or 2.4 % of the generated total.

Table 2.14

Treatment and disposal of hazardous waste in Estonia in 2000

	Quantity (1 000 tonnes)	Percentage
Total amount generated	5 966	100.0 %
Recovery operations total, of which	141	2.4 %
Incineration with energy recovery (R1)	3	< 0.1 %
Recycling, composting, etc. (R2-6)	59	1.0 %
Other recovery operations (R7-11)	79	1.3 %
Preparatory activities (R12-13)	1	< 0.1 %
Disposal operations total, of which	5 773	96.8 %
Physico-chemical treatment (D9)	2	< 0.1 %
Biological treatment (D8)		
Direct incineration without energy recovery (D10-11)	0.3	< 0.1 %
Landfill and other deposit into or onto land (D1-5)	5 768	96.7 %
Release into water bodies (D6-7)		
Permanent storage (D12)		
Preparatory activities (D13-15)	3	< 0.1 %

Hazardous waste is incinerated in seven incineration plants (see Table 2.15). One of these plants is especially designed for oil waste. The other facilities are cement kilns, facilities of the oil shale industry or other combustion plants which are co-incinerating oil waste and other organic hazardous wastes not containing halogens and heavy metals. For 2000, a total amount of energetically recovered waste of 3 000 tonnes is reported. However, this way of treatment can only be continued if the incineration plants are able to comply with the directive on the incineration of waste (2000/76/EC).

Table 2.15

Waste treatment and disposal installations for hazardous and non-hazardous waste (2000)

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)			
Capacity (1 000 tonnes)			
Incineration plants			
Number (n)	10	7	
Capacity (1 000 tonnes)			
Landfill sites			
Number (n)	144	26	
Remaining capacity (1 000 tonnes)			
Permanent storage			
Number (n)			
Capacity (1 000 tonnes)			
Other			
Number (n)			
Capacity (1 000 tonnes)			

The Estonian hazardous waste management system does not envisage a centralised incineration plant for hazardous waste due to its costs and the quantities of hazardous waste that require treatment. Sufficient treatment capacity for inorganic hazardous waste and less hazardous organic wastes can be provided within Estonia. For the treatment of organic halogenated hazardous waste Estonia will have to rely on foreign assistance [1].

Some of the main problems of waste management in Estonia relate to the huge amounts of oil shale wastes. Ashes from the burning of oil shale at power plants generate water pollution as hydraulic methods are used to dump them on the ash fields. Semi-coke, also generated from the oil shale industry, has been heaped on industrial landfills, from where it contaminates the underlying aquifers with oil products, phenols, and aromatic compounds [1].

Currently efforts are being made to change the hazardous properties of oil shale waste. A new technology is expected to be introduced in 2009 and the EU has accepted a transition period for the implementation of the landfill directive (1999/31/EC) concerning liquid and corrosive slurry of oil shale ash.

Import and export of waste

In Estonia, imports and exports are carried out in accordance

(1))The national development plan for hazardous waste management is included in the national waste management plan that was approved in 2002.

with the regulations of the Basel Convention. Waste imports to Estonia are rather low. In 1999, they amounted to 79 900 tonnes or 0.7 % of the generated waste. Scrap metal and other ferrous and non-ferrous metal waste made up 93 % of the imported waste. In addition, accumulators were imported from the other Baltic countries. Metal waste and accumulators are imported for further export.

Waste exports have increased in recent years and amounted to 394 000 tonnes or 3.6 % of the generated total in 1999. Due to the lack of facilities needed for the treatment of some types of recyclable waste exports included mainly metal scrap and metal waste (276 000 tonnes), wood waste (83 900 tonnes), oil shale slag (14 000 tonnes), paper and board waste (10 700 tonnes) and accumulators (5 400 tonnes) [3]. In addition, remarkable amounts of halogenated waste (pesticides, PCBs) have been treated abroad (Ekokem, Finland) in recent years.

Institutions and contacts

Institution	Contact
Ministry of the Environment	www.envir.ee
Estonian Environmental Information Centre	www.envir.ee/itk
Statistical Office of the Estonian Republic	www.stat.ee

Selected regulations

- Waste Act, entered into force 1.12.1998 (RT I 1998, 57, 861)
- Regulation No 2 of 11.1.2002 on the waste report form and submission procedure
- Regulation No 263 of 24.11.1998 on the approval of the lists of waste categories, waste types and hazardous waste (RT I 1998, 103, 1705)
- Regulation No 34 of 17.3.1999 of the Ministry of the Environment on the enforcement of Article 36 of the Waste Act in issuing a waste permit (RTL 1999, 59, 780)
- Integrated Pollution Prevention and Control Act, entered into force 1.5.2002 (RT[1] I 2001, 85, 512), amended 19.6.2002 with effect from 1.8.2002 (RT I 2002, 61, 375)
- Environmental Register Act, passed 19.6.2002, entered into force 1.1.2003 (RT[1] I 2002, 58, 361)

References

[1] *2002 Regular report on Estonia's progress towards accession*, European Commission, 2002

[2] Environmental Performance Review — Estonia Second Review', *Environmental Performance Reviews Series*, No 12, UN-ECE, New York and Geneva, 2001

[3] *State of the environment in Estonia on the threshold of XXI century*, Estonian Environment Information Centre, Tallinn, 2001

Latvia

Basic information

Latvia is composed of the four historical regions of Vidzeme, Kurzeme, Latgale and Zemgale, and covers an area of 64 600 km². The country is divided into 26 administrative districts. The population in 2001 was 2.37 million of which around 759 000 inhabitants live in Riga, the capital.

The economy of Latvia has been expanding since 1996 with an annual average GDP growth rate of about 6 %. Due to the economic crisis in Russia that effected Latvian exports, growth rates in 1998 and 1999 were modest (3.9 and 1.1 % respectively). However from the middle of 1999, the country's economy began to gradually recover from the negative external impacts. In 2000 the positive trends became even more pronounced, showing that Latvia has overcome the difficulties that were created by external conditions. Currently GDP per capita is just below the average for the candidate countries [1]. Regarding the structure of production, 70.4 % of gross value added in 2001 accounts for services.

Table 2.16
Macroeconomic indicators in Latvia

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	2 433	2 410	2 390	2 373	2 355
GDP at current prices (million euro)	5.0	5.4	6.2	7.8	8.5
GDP per capita at current prices (euro)	2 000	2 200	2 600	3 300	3 600
Change of GDP over previous year (%)	8.4	4.8	2.8	6.8	7.7
Structure of production (% of gross value added)					
Agriculture	5.6	4.4	4.3	4.9	4.7
Industry	27.4	23.4	19.9	18.6	18.7
Construction	4.8	6.9	7.1	6.7	6.2
Services	62.1	65.4	68.6	69.8	70.4

Source: *[2]*

Waste legislation

The Waste Management Law was adopted in December 2000, and has been in force since March 2001. This framework law transposes the basic requirements of the EC waste framework directive and hazardous waste directive, and provides a basis for the development, completion and enforcement of subordinated regulations on waste management. The adoption of the new

Waste Management Law also led to the drafting of a waste management plan (including hazardous waste) in line with the provisions of the relevant directives. The strategic document 'State waste management plan 2003–12' was published in 2003.

Regarding waste classification, Latvia adopted the European hazardous waste list for the classification of hazardous waste. The implementation of a national waste catalogue based on Decision 2000/532/EC (European waste list — EWL) which includes all waste types, was carried out in July 2002 (Regulation No 258 on waste classification and characteristics which make waste hazardous).

Permits and licenses

The obligation to issue permits for waste management activities is stipulated in the Waste Management Law, Chapter IV, Section 11. Regional environment administrations issue permits on treatment of waste, landfilling of waste, collection, storage and reloading of waste. The regional environment administration shall, in accordance with the final destination of the hazardous waste to be transported, issue permits for the transportation of the hazardous waste in the territories under its supervision and inform the relevant city council of such.

According to point 59 of Regulation No 294 on the application of Category A, B and C polluting activities and the issuing of permits for Category A and B polluting activities (9 July 2002) these newly issued integrated Category A and B pollution permits replace other previous permits on air pollution, water use permits and waste management permits (excluding permits on waste transportation). In the present transitional period there are two types of permit in operation: media specific and integrated. For example, if an operator received a permit two years ago on waste management (a permit is usually issued for five years), this permit is still valid for three more years. Operators who now begin to work on waste management activities (excluding waste transportation) or experience significant changes in previous activities requiring a permit will receive an integrated permit (which includes waste management too). According to Regulation No 294 all waste management operators (landfills, waste collecting companies, treatment facilities) are Category A and B operators.

The procedure for issuing permits for waste management activities is stipulated in Regulation of the Cabinet of Ministers No 432 'on the issuing, prolonging and annulling of permits for waste management'.

Record keeping and reporting obligations

According to the Waste Management Law (WML), Chapter V, Section 20, persons who are engaged in waste management have to record the amount (volume), type, origin, frequency of collection, transportation, type of treatment and disposal and place of treatment and disposal regarding waste under management.

The persons who are engaged in waste management shall submit the compiled information annually to the regional environmental boards (the authorised institutions of the Ministry of the Environment) as well as to the relevant local council and shall keep such documents for a period of three years. In addition, the persons have to provide information upon request to State authorities, local councils and the general public.

The Regulation of Cabinet of Ministers No 319 on 'accounting, identification, storage, packaging, labelling and transportation of hazardous waste' stipulates the respective measures for the correct management of hazardous waste. Furthermore, legal persons who store hazardous waste for longer than 12 months and persons who perform the management of hazardous waste are obliged to ensure the recording, packaging, labelling and identification of hazardous waste (WML, Section 14, clauses 2 and 3).

Institutional framework

The **Ministry for the Environment (MoE)** is the competent authority for the development and implementation of the national waste management policy. It is responsible for the elaboration of strategies, plans, programmes and legal acts according to the requirements set by the EU, UN and other international organisations, and for the coordination of international cooperation on environmental matters. Furthermore, it has the overall authority for monitoring and reporting. The MoE is responsible for the organisation and coordination of hazardous waste management.

The **Latvian Environment Agency (LEA)** is a governmental institution subordinated to the MoE. The aim of the LEA is to implement governmental policy in the area of environmental data and information compilation, processing and dissemination. The LEA collaborates with different institutions — data and information stakeholders — to establish and develop the unified environment information system according to Latvian and European Union legislation. The LEA operates as a national focal point for the European Environment Agency and the United Nations Environment Programme and is the national coordinator of the Helsinki Convention.

The **State Environmental Inspectorate** controls the fulfilment of laws and regulations regarding waste, issues authorisation permits for hazardous waste transport activities and hazardous waste transit, and supervises and guides the enforcement work carried out by the regional environmental boards. They participate in hazardous waste inventories and accounting.

The eight **regional environmental boards** control waste management through issuing permits, licensing, inspection, monitoring and data collection.

The **municipalities** are responsible for organising the collection, transportation and disposal of municipal waste, supervising transportation and disposal of industrial waste, deciding on the siting of waste management facilities, issuing local regulations on waste management, financing and supervising dump/landfill closures and termination of waste management facilities, and participating in regional projects (including a share of the cost).

The **Latvian Environmental Protection Fund** is responsible on behalf of the Ministry for managing, revenue gained from the Natural Resources Tax. This fund is used to finance environmental projects, including waste management projects.

Waste information collection

In Latvia annual statistical surveys have been conducted for hazardous waste since 1997 and for municipal waste since 2001 (Form No 3-SA). The data survey on hazardous waste is carried out by means of a special questionnaire (Form No 3-BA), which has to be filled in by all hazardous waste producers. The waste producers have to state their economic activity according to NACE codes. The waste amounts generated per year (volume)

and the respective EWC codes have to be declared. In addition, the method of waste treatment has to be specified. The data is collected by the eight regional environmental boards (REBs). The REBs are responsible for data quality and conduct the primary verification and approval of the collected information. Afterwards the data is verified and approved by the State Environmental Inspectorate. Data and information on hazardous waste are centrally processed by the Latvian Environment Agency (LEA). Final data approval is carried out by the Ministry of the Environment.

Regarding non-hazardous industrial waste, persons who are engaged in waste management shall submit the compiled information (records) annually to the Ministry of the Environment (or its authorised institution) as well as to the relevant local council (WML, Chapter V, Section 20). A separate survey on non-hazardous industrial waste has not been carried out in recent years.

Pilot project

Within the Phare multi-country statistical cooperation programme, Phase II, Latvia conducted a pilot project which was entitled 'Improvement of data processing and reporting on non-hazardous industrial and hazardous waste' [3]. The project was conducted due to the following problems:

- incorrect classification of wastes;
- incorrect classification of waste treatment operations;
- incomplete coverage of waste generators;
- poor control of transportation of hazardous waste.

As a tool to accomplish these information deficits and to improve the procedure of data collection, a new questionnaire for data collection and reporting has been designed. The questionnaire represents the basis for future data surveys on hazardous and non-hazardous industrial and municipal waste and takes account of EU reporting obligations. The questionnaire will be addressed to all enterprises, institutions and organisations who have permits on pollution activities or permits on waste management. This will cover waste generators as well as waste collection, waste treatment and waste disposal companies. It is estimated that the number of reporting operators will increase from 800 (today) to more than 4 000 in the future.

The paper version of the questionnaire is accompanied by an instruction manual explaining what information is required. In addition, an online version of the questionnaire is available which is linked to the waste database (WDB). The questionnaire considers hazardous waste, non-hazardous industrial waste and municipal waste and consists of five parts:

- Part A: information on the company (common for all reporters)
- Part B: Data on waste generators (waste balance on site during reporting year)
- Part C: Data on waste management companies (waste balance during reporting year, separate for collected waste and treated waste)
- Part D: Data on companies performing separate collection or sorting of non-hazardous waste
- Part E: Data on all companies who deliver waste to third parties (allows for the checking of data from Parts B,C,D and avoids double counting of waste)

The questionnaire is coordinated with the Central Statistical Bureau of Latvia and the State Environmental Inspectorate. After adoption of the questionnaire by the Ministry of the Environment it is expected to be used in data collection for the year 2003.

Data on waste management

Data on hazardous waste has been annually surveyed by the regional environmental boards using Form No 3-BA. On the other hand, the data situation on non-hazardous industrial waste in Latvia is very poor because in the past there has been no obligation to report on this type of waste and no surveys have been conducted. Since the adoption of the new Waste Management Law in December 2000, persons engaged in waste management have been obliged to keep records on waste amounts and waste properties and to submit a compilation of this information to the Ministry of the Environment. Waste generators are not obliged to report on their non-hazardous industrial waste.

Data on non-hazardous industrial waste was reported to Eurostat for the first time in 2001. Data is based on the State statistical survey (Form No 3-SA) on municipal waste which partly contains data from industrial enterprises too. The coverage of industrial waste generators (enterprises) was minimal due to the poor dissemination of questionnaires by the REBs. This coverage of enterprises generating industrial waste will be significantly improved by issuing the Category A and B permits on integrated pollution (see the section entitled 'Permits and licenses')

Waste generation

Industrial waste

The following data is based on the OECD/Eurostat joint questionnaire. Data on industrial waste is only available for the year 2001. For the previous years no information on industrial waste had been reported to OECD/Eurostat due to the lack of an industrial waste inventory in Latvia.

For the year 2001, Latvia reports a total waste generation of 1 186 000 tonnes of which municipal waste accounts for 713 000 tonnes and waste from agriculture and forestry accounts for 4 450 tonnes. Industrial waste amounts to 542 000 tonnes. This is equivalent to a per capita amount of 230 kg per annum. Compared with the other candidate countries this is by far the lowest amount. It can be assumed that only a proportion of waste generators reported on their waste amounts, due to missing reporting obligations in the waste management legislation.

Hazardous waste in Latvia is mainly generated by manufacturing industries (96 %). Within this sector the highest proportion stems from 'Basic metal industries' as well as 'Fabricated metal products, machinery'. The biggest hazardous waste generator in Manufacturing industry is the sector that generates the highest proportion of industrial waste (78 %). The remaining sectors are only of low importance but there is a considerable amount of waste from 'Other' sectors (18 %), which is not specified.

Figure 1 depicts the breakdown of industrial waste generation according to sectors. The waste from manufacturing industries is mainly generated by the industry 'Food, beverages, tobacco'.

Figure 2.13

Breakdown of industrial waste generation (including hazardous waste) in Latvia by sectors in 2001

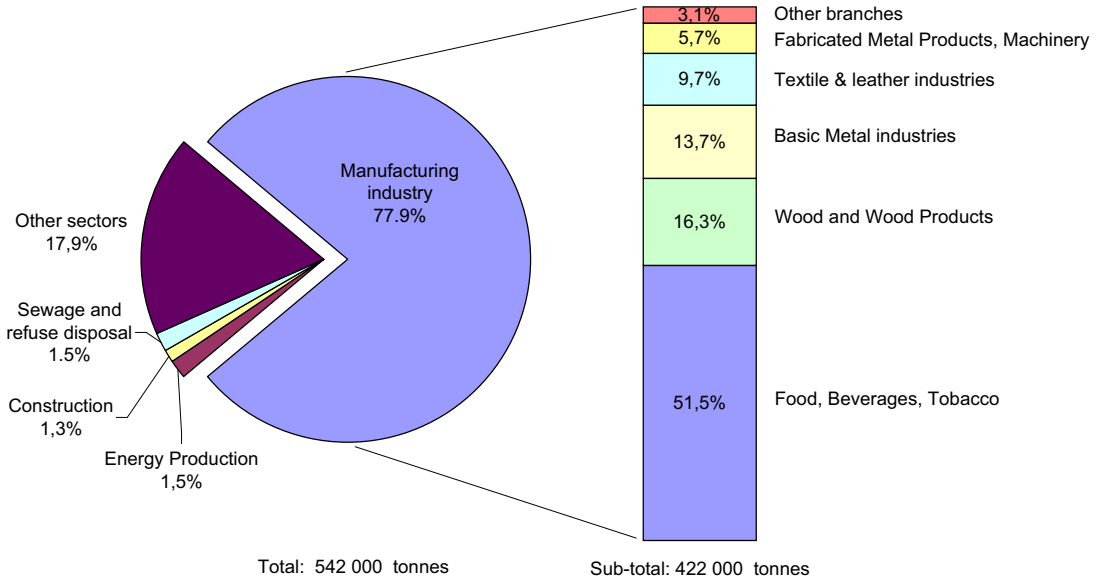
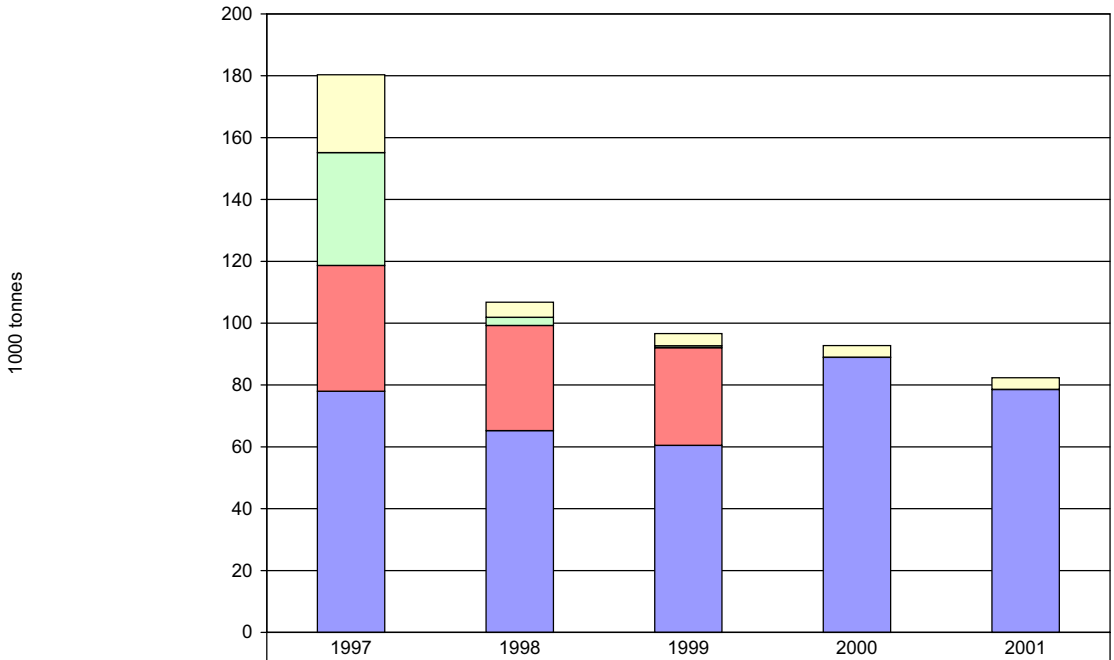


Figure 2.14

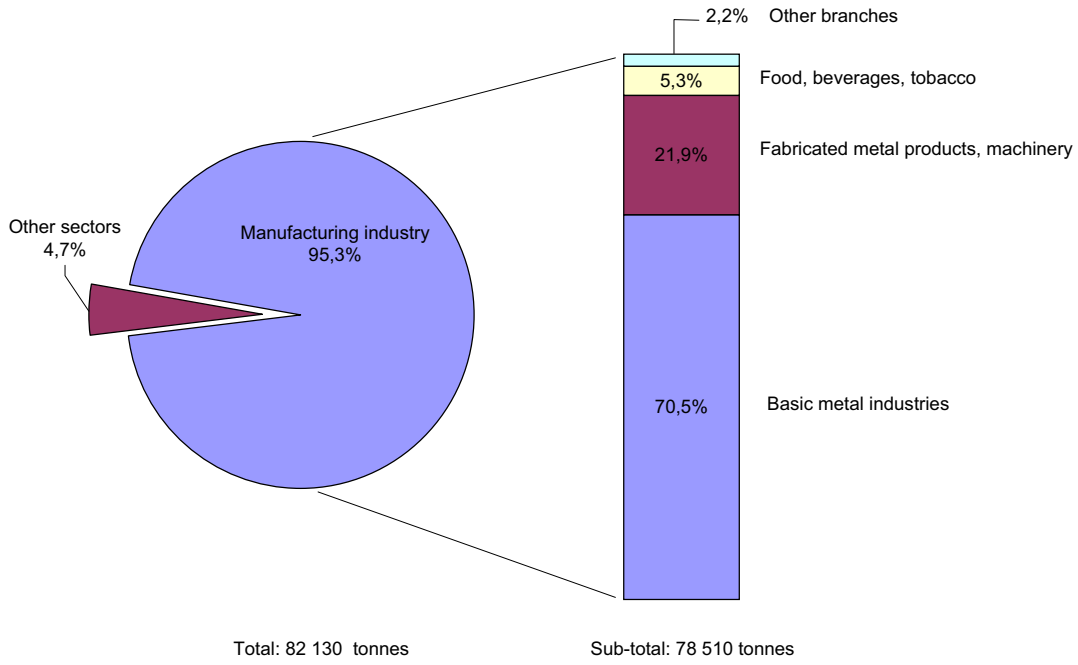
Development of hazardous waste generation in Latvia



	1997	1998	1999	2000	2001
Other sectors	25	5	4	4	4
Sewage and refuse disposal	37	3	1	0	0
Water supply	41	34	32	0	0
Manufacturing industry	78	65	60	89	79

Figure 2.15

Breakdown of hazardous waste from manufacturing industries in Latvia by sectors in 2001



Hazardous waste

The development of hazardous waste amounts in Latvia is depicted in Figure 2. The amount of hazardous waste decreased from 180 000 tonnes in 1997 to 82 000 tonnes in 2001. The development of hazardous waste amounts and waste types is quite inconsistent. While in 1997, 1998 and 1999 waste from water purification and distribution was classified as hazardous waste, this waste did not appear in the hazardous waste statistics of 2000 and 2001.

In the past few years there have been no strictly defined quality criteria for the classification of sewage sludge, therefore significant variations in the statistics on hazardous waste occurred. Since 20 August 2002, when Regulation No 365 on the use, monitoring and control of sewage sludge and its compost came into force, five quality classes of sludge have been identified. Depending on the content of heavy metals, sewage sludge can be definitely classified as hazardous or non-hazardous waste.

Latvia is the smelter in the city of Liepaja that generates about 50 000 tonnes per year.

Waste treatment and disposal

Non-hazardous industrial waste

The total of non-hazardous waste from manufacturing industries in 2001 amounted to 344 000 tonnes. 84 000 tonnes (24.5 %) have been recovered, of which 57 000 tonnes (16.6 %) have been recycled and 27 000 tonnes (7.9 %) were incinerated with energy recovery. The predominant disposal operation for non-hazardous industrial waste is landfilling. In 2001 almost 200 000 tonnes (57.5 %) were disposed of in landfills (see Table 2.17).

Table 2.17

Treatment and disposal of non-hazardous waste from manufacturing industries in Latvia in 2001

	1 000 tonnes	%
Total amounts generated by manufacturing industries [(a)]	344	100 %
of which designated for		
Recovery operations		
Recycling	57	16.6 %
Incineration with energy recovery	27	7.9 %
Disposal operations		
Incineration without energy recovery		
Landfill total amounts	198	57.5 %
of which controlled landfill		

(a) The given total does not necessarily equal the sum of recovery and disposal operations.

The number of landfill sites in Latvia has decreased significantly since 1997. While in 1997, there were 558 waste dumps, in 2001 only 341 were still in operation (see Table 2.19). This decrease was caused by the new waste management legislation which came into force in 2000. Since then permits for the disposal of waste on dumpsites have been required.

In order to minimise the impact of waste management on the environment it is hoped that all dump sites which do not meet

environmental standards will be closed. The number of operating landfill sites will be reduced to 10–12 by 2010.

Hazardous waste

The possibilities for processing of hazardous waste in Latvia are very limited. Table 2.18 shows that only 23 000 tonnes (28 %) of the generated hazardous waste were physico-chemically processed in 2001. Some 5 000 tonnes have been incinerated.

In Latvia 42 enterprises are registered for the collection and processing of hazardous waste. Some 10 treatment plants for hazardous waste are available. The necessary capacity for treatment of hazardous wastes is currently not available. For that reason, hazardous waste which cannot be processed must be stored on the premises of enterprises. Over a long period of time about 1.5 million tonnes of hazardous waste have been accumulated [4] which require future recovery or disposal operations in line with environmental standards.

Table 2.18

Treatment and disposal of hazardous waste in Latvia in 2001

	1 000 tonnes	%
Total amount generated [(a)]	82	100.0 %
Recovery operations total, of which		
Incineration with energy recovery (R1)		
Recycling, composting, etc. (R2-6)		
Other recovery operations (R7-11)		
Preparatory activities (R12-13)		
Disposal operations total, of which		
Physico-chemical treatment (D9)	23	28.0 %
Biological treatment (D8)		
Direct incineration without energy recovery (D10-11)	5	6.1 %
Landfill and other deposit into or onto land (D1-5)		
Release into water bodies (D6-7)		
Permanent storage (D12)		
Preparatory activities (D13-15)		

(a) The given total does not necessarily equal the sum of recovery and disposal operations.

Table 2.19

Waste treatment and disposal installations for hazardous and non-hazardous waste in Latvia in 2001

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)		10	
Capacity (1 000 tonnes)			
Incineration plants			
Number (n)			
Capacity (1 000 tonnes)			
Landfill sites			
Number (n)	341		
Remaining capacity (1 000 tonnes)			
Permanent storage			
Number (n)			3
Capacity (1 000 tonnes)			2
Other			
Number (n)			
Capacity (1 000 tonnes)			

Institutions and contacts

Institution	Contact
Ministry of the Environment	www.vidm.gov.lv
Latvian Environment Agency	www.lva.gov.lv
Baltic Environmental Forum	www.bef.lv

Relevant regulations

- Waste Management Law (the law was adopted in Parliament on 14.12.2000 and came into force on 1.3.2001)
- Regulation of the Cabinet of Ministers No 294 on the application of Category A, B and C polluting activities and the issuing of permits for Category A and B polluting activities (9.7.2002)
- Regulation of the Cabinet of Ministers No 258 on waste classification and characteristics which make waste hazardous (19.6.2001, amendments 23.7.2002)
- Regulation of the Cabinet of Ministers No 529 on the order of waste management for particular types of hazardous waste (18.12.2001)
- Regulation of the Cabinet of Ministers No 319 on accounting, identification, storage, packaging, labelling and transportation of hazardous waste (23.7.2002)
- Regulation of the Cabinet of Ministers No 365 on the use, monitoring and control of sewage sludge and its compost (20.8.2002)

- Regulation of the Cabinet of Ministers No 323 on the requirements for incineration of waste and for operation of waste incineration plants (17.7.2001)
- Regulation of the Cabinet of Ministers No 432 on the issuing, prolonging and annulling of permits for waste management
- Regulation of the Cabinet of Ministers No 191 on types of waste recovery and waste disposal
- Packaging Law (adopted on 9.1.2002, came into force on 1.7.2002)

References

[1] *The national economy of Latvia: Macroeconomic review*, Vol. 1(6), Ministry of the Economy of the Republic of Latvia, 2001

[2] *2002 Regular report on Latvia's progress towards accession*, European Commission

[3] Improvement of data processing and reporting on non-hazardous industrial and hazardous waste', pilot project within the Phare multi-country statistical cooperation programme, Phase II, Latvian Environment Agency, Riga, 2003

[4] *Environment indicators in Latvia 2002*, Latvian Environment Agency, Riga, 2002

Lithuania

Basic information

Lithuania is the most southern of the Baltic States. With an area of 65 301 km² it is also the largest one. Lithuania consists of 10 counties and has a population of 3.5 million inhabitants. Some 68 % of the population lives in urban areas. Major cities are the capital Vilnius with 578 000 inhabitants, Kaunas and Klaipeda.

Industry was Lithuania's major economic sector until 1991. During the first year of independence Lithuania's industry suffered the steepest decline in the Baltic region. The share of industry in per cent of gross value added dropped from 44 % in 1991 to 28 % in 2001. Since 1997, development has been generally positive. On average, real gross domestic product (GDP) has grown annually by 3.6 % and exports by 7.4 %.

Table 2.20
Statistical data on population and economy

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	3 575	3 549	3 524	3 500	3 481
GDP at current prices (million euro)	8.5	9.6	10.0	12.2	13.4
GDP per capita at current prices (euro)	2 400	2 700	2 800	3 500	3 800
Change of GDP over previous year (%)	7.3	5.1	– 3.9	3.8	5.9
Structure of production (% of gross value added)					
Agriculture	11.7	10.3	8.4	7.7.	7.0
Industry	25.2	23.9	22.9	25.8	28.4
Construction	7.7	8.6	8.0	6.1	6.1
Services	55.4	57.3	60.8	60.4	58.6

Source: *[1]*

The main manufacturing industry sectors in Lithuania are food processing, light industry, machine building and metalworking, electronics and electrical appliances, building materials, and energy production. Some of the main industrial branches are dependent on imports of raw material, and production has been disrupted by the breakdown of traditional trade ties. This is not true for the construction industry that uses local materials. Quarries are located in the vicinity of Vilnius and near Kaunas. The biggest cement plant in the Baltic region is located at Akmene in north-western Lithuania. The only refinery in the Baltic region, the Mazeikiai Oil Refinery, is also situated in Lithuania. It is Lithuania's largest industrial complex. More than 50 % of refined products is exported.

Waste legislation

The framework for Lithuanian waste legislation is defined by the Law on Waste Management (1998, amended in July 2002). Most waste management activities regarding hazardous waste and non-hazardous industrial waste are regulated by the waste management regulations, approved in 1999 by the Minister of the Environment (WMR, 1999). The waste management regulations contain provisions on waste management plans, registration of waste managers, waste statistics, hazardous waste management and documentation of waste management activities.

Permits and licenses

Chapter III WMR stipulates that all enterprises engaged in waste collection, transportation, recovery and disposal activities shall be registered in the waste managers register. In the registration certificate form (Annex VII) the enterprises have to specify their activities according to the types of waste management defined in Annex VIII WMR. The registration certificates are issued by the regional environmental protection departments (REPDs). The waste managers register is kept by the Environmental Protection Agency in the Ministry of the Environment.

Hazardous waste collection, transportation, storing, disposal and recovery enterprises need a license on hazardous waste management. Licenses concerning hazardous waste are issued by the Ministry of the Environment. Enterprises have to submit a registration certificate form to the REPD together with the application for a license.

Record -keeping and reporting obligations

Chapter IV WMR stipulates that each company that is engaged in waste management activities and is registered as such in the waste managers register has to keep a primary waste recording log, using the form presented in Annex IX WMR. The same obligation applies to industrial enterprises that have more than 50 employees and carry out one of the economic activities listed in Annex XI WMR [1]. The obligated companies have to record, *inter alia*, the waste accumulated before commencement of the log, waste codes and denominations, waste quantities generated, transferred, received or managed, type of management as well as source and recipient of the waste. Waste recording logs shall be submitted to the authorised officials of the Ministry of the Environment, counties or municipalities upon their request. Since 1 January 2000 the keeping of records is mandatory.

Chapter V WMR builds the legal basis for the Lithuanian waste data collection system. According to clause 36, waste recovery and disposal companies as well as companies who import or export waste are obliged to report annually on waste management issues, using the form of national waste recording report in Annex XIII WMR. Branches or divisions of an enterprise located separately have to fill in individual reports. The reports have to be submitted by 25 January of the following year. The first reports had to be submitted in January 2001 providing data for the year 2000.

Waste classification

Lithuania uses two different waste classifications in parallel, the Lithuanian **list of wastes** (Annex II WMR) and the **statistical classification of wastes** (Annex XII WMR). The Lithuanian list of wastes is prepared in accordance with the European waste catalogue and the hazardous waste list whereas the statistical classification of wastes corresponds to the substance-oriented EWC-Stat as included in the draft Council regulation on waste management statistics (COM(1999) 31 final). Both classifications were established by the regulations on waste management in 1999 and have been valid since the beginning of the year 2000. As of 2004, these classifications will be replaced by the European waste list (Commission Decision 2000/532/EC and subsequent amendments) and the EWC-Stat2 as included in the waste statistic regulation (2002/2150/EC).

Institutional framework

The **Ministry of the Environment** (MoE) is the main institution responsible for legislation and administration in the field of waste management. The Ministry coordinates the activities of State, regional and local institutions and has to prepare the national strategy waste management plan. The Ministry of the Environment is responsible for the compilation of national waste statistics and for reporting on the national level as a competent authority.

Enforcement and control of waste management legislation is carried out by the **State Environment Protection Inspectorate** (SEPI) and the subordinated **8 regional environment protection departments** (REPDs). The regional departments are responsible for permits, environmental impact assessment, laboratory control and enforcement of environmental regulations. To carry out those functions, they have a centrally-based core staff and **56 agencies** at the district or city level [2]. The agencies are responsible for environmental inspections.

The **Environmental Protection Agency** (EPA) was founded only recently by merging the former **Joint Research Centre** and the **Department of Management of Water Resources**. The EPA is subordinated to the Ministry of the Environment. It took over the responsibility for environmental monitoring in general and for waste data collection in particular from the Joint Research Centre. The EPA is also involved in the preparation of legal acts. The final scope of responsibilities of the EPA is still under discussion.

Waste information collection

With the adoption of the waste management regulations in 1999 Lithuania changed its system of waste data collection. By then, data were collected from waste generators and collectors whereas the new system is based on the annual reports of waste recovery and disposal companies as well as companies who import or export waste. Obligated parties have to fill in the **national waste recording report** (Annex XIII WMR) that covers the following items:

- source of waste (geographical code of waste origin, code of industrial origin (NACE), name of waste producer);
- waste characteristics (code of statistical waste classification and code according to waste list, name of waste);
- quantity of waste (quantity accumulated at the beginning of the year, quantity received from elsewhere over the year, quantity managed over the year);
- treatment operation (code and name of treatment method according to the Lithuanian list of waste treatment types).

The local agencies collect the data for the regional environment protection departments (REPDs). The agencies carry out an initial manual checking of the reports. Data entry into electronic data sheets and verification is done by the REPDs. The electronic data sheets are forwarded to the Environmental Protection Agency for additional verification and final data processing. A summary of the results is published in the annual reports on the State of the Environment of the Ministry of the Environment.

The old data collection system had been in place since 1993 and the last reports according to the old system for the year 1999 were due in January 2000.The first survey following the new approach was conducted in 2001 referring to the year 2000. The number of obligated enterprises totalled 571.

Pilot project

Currently, the Lithuanian waste data collection system faces several problems with regard to compliance with the reporting requirements of the EU waste statistics regulation (WSR, No 2150/2002) and the OECD/Eurostat joint questionnaire (JQ).

- The two Lithuanian waste classification systems do not yet comply with the latest versions of the European classifications (EWL and EWC-Stat2).
- It is difficult to assign the waste to the generating sectors because the annual reports of the waste treatment and dis-

(1) Annex XI includes the NACE Sections C to I and selected divisions of K, N and O. The Sections A and B, J, P and Q are not included. For designation of NACE sections please refer to the annex.
(2))The number of agencies will be raised to 60, following the number of municipalities.

posal facilities contain insufficient information on the origin of waste.

- The definitions of recovery and disposal operations in the Lithuanian waste management regulations are not in line with the definitions of the waste framework directive.

Lithuania addresses these problems in a pilot study [1] that was carried out in the framework of the Phare multi-country statistical cooperation programme. The overall objective of the project was to transpose the outcome of the waste data collection system into an integrated and structured set of tables that is able to fulfil EU and OECD reporting obligations. In a first step, the data sources, the quality control processes and the data sets generated by the integrated Lithuanian waste information system were described and compared to the requirements of the WSR and the JQ. In further steps tools were developed to extract the necessary information and to transform it into matrices in line with the reporting requirements. The project was carried out by the Ministry of the Environment, the Environmental Protection Agency and Statistics Lithuania and was finished in August 2003.

Data on waste management

In the following sections, the data on waste management in Lithuania as reported to Eurostat in the joint questionnaire (JQ) [7] are presented. The latest available data refer to the year 2001. Additional information was taken from publications of the Ministry of the Environment, in particular from the state of the environment reports 2000 [2] and 2001 [3].

Waste generation

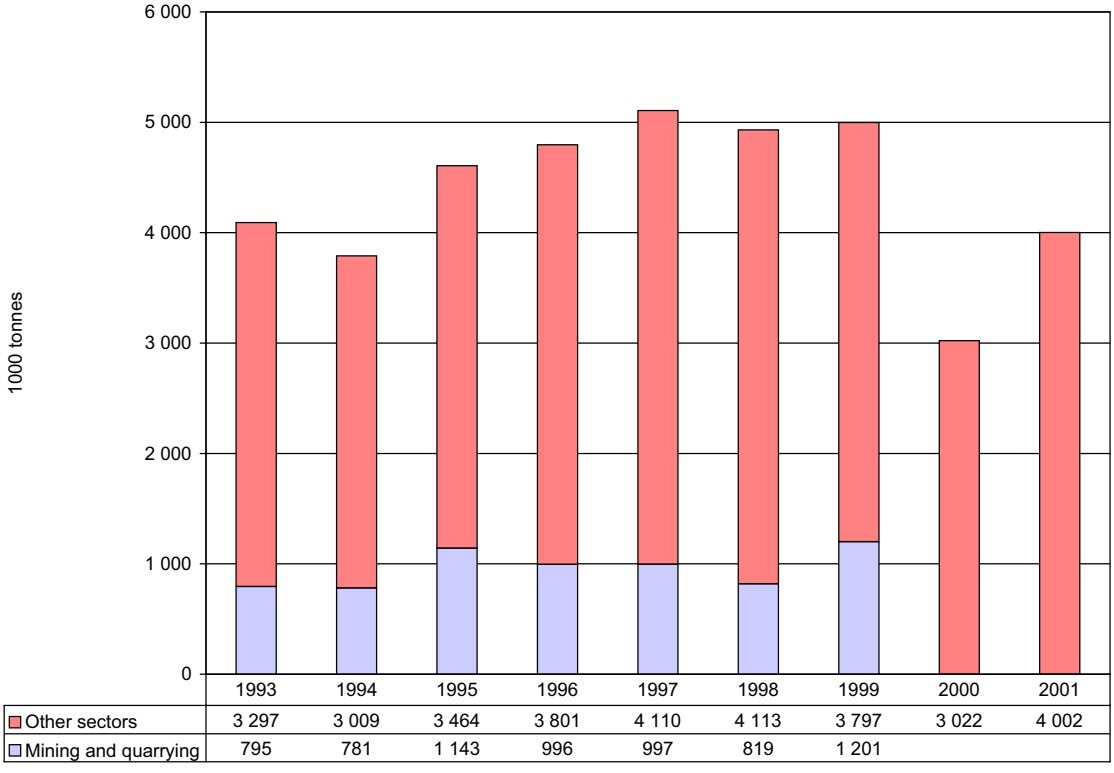
Industrial waste

As outlined above, the new Lithuanian waste information system does not provide detailed information on the origin of waste. For the years 2000 and 2001, the data reported to Eurostat distinguish between **municipal waste** and **waste of other origin**. In the following, waste of other origin is referred to as industrial waste although the originating sectors are not specified. Before 2000, data on waste generation were collected from waste generators and collection companies. However, mining and quarrying is the only industrial activity for which the generated waste amount was specified. It has to be pointed out that Lithuania reports no figures on the total waste generation in Lithuania because the available data are considered to be incomplete.

Figure 2.16 shows the generation of industrial waste in the period between 1993 and 2001. The figures indicate an increase in industrial waste until 1997 and a rather constant generation of about 5 million tonnes until 1999. The introduction of the new data collection system and the change of waste classifications in 2000 caused a break in time series. The generated amount dropped by nearly 2 million tonnes (40 %) but increased again in the following year. These fluctuations are apparently due to the introduction of the new data collection system. It will take some time before the new system is established and will produce reliable results.

Figure 2.16

Development of industrial waste generation in Lithuania (excluding hazardous waste) [7]

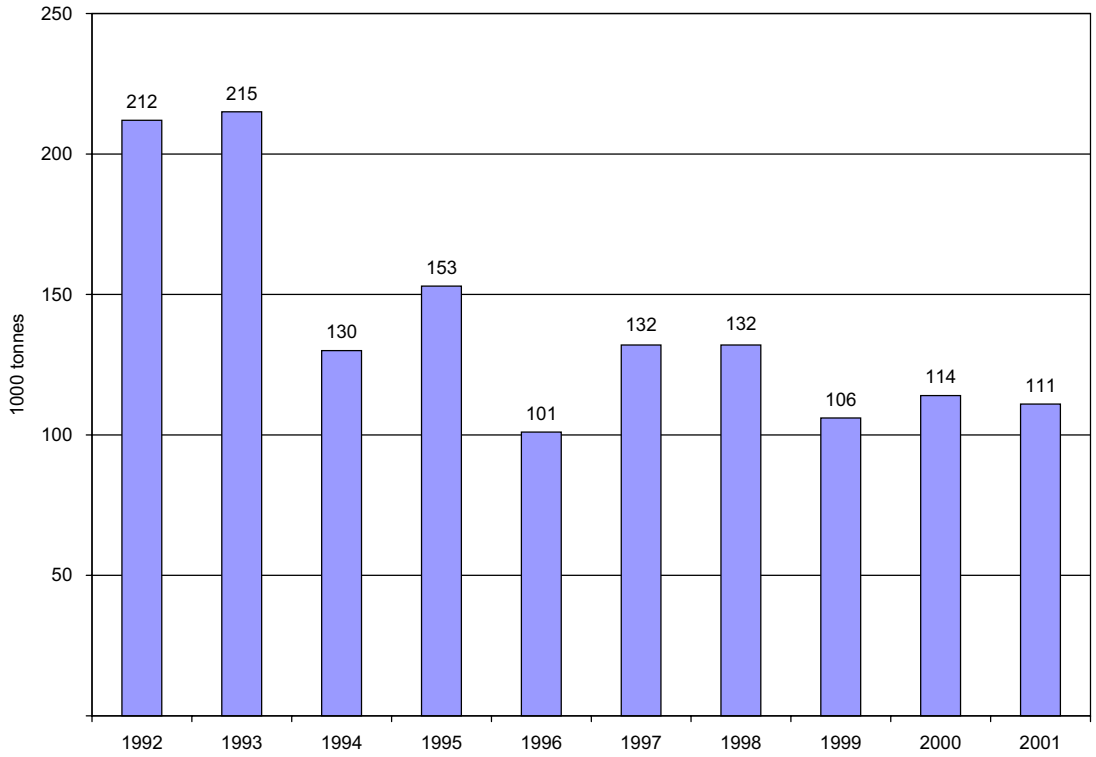


	1993	1994	1995	1996	1997	1998	1999	2000	2001
Other sectors	3 297	3 009	3 464	3 801	4 110	4 113	3 797	3 022	4 002
Mining and quarrying	795	781	1 143	996	997	819	1 201		

(1))'Preparation and transposition of collected waste information into reporting forms requested by the EU waste statistics regulation and the joint questionnaire', Vilnius, August 2003.

Figure 2.17

Development of hazardous waste generation in Lithuania [7]



Hazardous waste

In 2001, hazardous waste generation in Lithuania amounted to 111 000 tonnes which corresponds to 32 kg per capita. Hazardous waste generation is dominated by the Mazeikiai Oil Refinery. The refinery generates up to 50 % of the hazardous waste total. A major part of the generated waste are oil/water mixtures, emulsions and other waste oils. In 1999, oil-containing waste in Lithuania amounted to 56 800 tonnes and accounted for 54 % of the hazardous waste total [4].

Figure 2.17 shows the development of hazardous waste generation since 1992. During the last 10 years the hazardous waste total decreased considerably. From 1992 to 2001 the generated total nearly halved. This development mainly results from a sharp decrease of oil and tannery wastes. Oil-containing waste generation declined from 109 900 tonnes in 1993 to 56 800 tonnes in 1999. In the same period, the amount of tannery waste fell from 14 800 tonnes in 1993 to 1 200 tonnes [4].

Waste treatment

Non-hazardous industrial waste

At present, the Lithuanian data collection system is unable to monitor the treatment and disposal of waste from the manufacturing industry separately. Accordingly, Lithuania did not provide data on that subject to Eurostat. Information on recovery and disposal of non-hazardous industrial waste was taken from other publications.

As regards recycling, the report on the *State of the environment 2001* highlights that the available recycling capacities of most common secondary raw materials (paper, glass and some sorts of plastic waste) are not fully used in Lithuania. Either the waste companies are not able to provide sufficient quantities or the secondary raw materials do not meet the required quality criteria. Thus, cardboard and plastic waste is imported while rather big shares of potential secondary raw materials are disposed of at landfills. In 2000, Lithuania imported 29 500 tonnes of paper and cardboard waste and 11 600 tonnes of plastic waste for recycling [2], [3].

According to the data from the joint questionnaire, non-hazardous waste was incinerated in 2001 in 67 facilities (see Table 2.22). These are mainly industrial facilities that use waste as fuel. Lithuania did not submit any data on landfills to Eurostat for the years 2000 and 2001, although some data were submitted in previous years. According to the Ministry of the Environment more than 800 landfills exist in Lithuania of which about 300 are in operation. Most of the landfills are small, covering an area of less than 1 hectare. Often the landfills are poorly designed and constructed. Many of them are garbage dumps in old abandoned gravel quarries. Therefore, it is intended to close down old dump sites and to replace them by modern regional landfills. The number of landfills shall be reduced to 30 by the year 2010 [4], [5].

Hazardous waste

Table 2.21 shows the data on the treatment of hazardous waste for the year 2001 as reported to Eurostat. For hazardous waste, Lithuania reports a very high recovery rate of nearly 76 % (84 000 tonnes). A minor share of 2.7 % (3 000 tonnes) was energetically recovered. The reported quantity of hazardous waste designated for final disposal is very low and amounted to only 5 000 tonnes or 4.5 % of the generated total. The discrepancy between the generated total and the sum of the treated

waste (about 20 %) in Table 2.21 is mainly due to the temporary storage of waste.

According to the report on the *State of the environment 2000*, the major part of the recovered hazardous waste is oil-containing sludge of the Mazeikiai Oil Refinery. The sludge is treated in centrifuges. Then the separated oil is recycled to crude oil and the remaining sludge is treated biologically. In the year 2000 about 46 170 tonnes of oil sludge were recovered. The recovered amounts in Table 2.21 also include the cleaning of oil-contaminated bilge waters (24 116 tonnes in 2000) and the biological treatment of oil-contaminated soils (15 498 tonnes in 2000). In addition to the treated and disposed of quantities a considerable amount of hazardous waste is temporarily stored in Lithuania. The respective quantities have increased in recent years. In 2000, the stored volume amounted to 90 000 tonnes and was nearly as high as the generated total. About 2 000 tonnes of hazardous waste had to be exported in the year 2000. Lead batteries constituted the major part among the exported wastes [2].

Table 2.21

Treatment and disposal of hazardous waste in Lithuania in 2001 [7]

	1 000 tonnes	%
Total amount generated	111	100.0 %
Recovery operations total, of which	84	75.7 %
Incineration with energy recovery (R1)	3	2.7 %
Recycling, composting, etc. (R2-6)		
Other recovery operations (R7-11)	81	73.0 %
Preparatory activities (R12-13)		
Disposal operations total, of which	5	4.5 %
Physico-chemical treatment (D9)		
Biological treatment (D8)		
Direct incineration without energy recovery (D10-11)	1	0.9 %
Landfill and other deposit into or onto land (D1-5)	3	2.7 %
Release into water bodies (D6-7)		
Permanent storage (D12)		
Preparatory activities (D13-15)		

In the joint questionnaire Lithuania reports that in 2001 hazardous waste was treated and disposed of in 26 treatment plants and 27 incineration plants. However, these facilities are not specifically designed for the handling of hazardous wastes. In addition, hazardous waste is treated and incinerated together with non-hazardous waste in seven treatment facilities and in seven incineration plants. For the permanent storage of hazardous waste three facilities were in operation in 2001 (see Table 2.22).

Lithuania is currently improving its infrastructure for hazardous waste management. In 2001 a regional hazardous waste storage site was constructed in Siauliai. Similar storage sites are being put in place in Alytus, Klaipeda and Vilnius [3]. According to the *acquis* implementation action plan for 2002–03 [6], Lithuania plans to design and construct an incineration plant and a landfill site for hazardous waste. The incineration plant shall start operation in 2006 to 2008. In addition, a system for the management of hazardous medicinal waste shall be developed.

Table 2.22

Waste treatment and disposal installations for hazardous and non-hazardous waste in Lithuania in 2001 [7]

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)	94	26 (a)	7
Capacity (1 000 tonnes)			
Incineration plants			
Number (n)	67	27 (a)	7
Capacity (1 000 tonnes)			
Landfill sites			
Number			
Remaining capacity			
Permanent storage			
Number (n)		3	
Capacity (1 000 tonnes)			
Other			
Number (n)			
Capacity (1 000 tonnes)			

(a) Plants are not specifically designed for hazardous wastes.

Institutions and contacts

Institution	Contact
Ministry of the Environment	www.am.lt
Environmental Protection Agency	aaa.am.lt
Statistics Lithuania	www.std.lt

Selected regulations

- Law on Waste Management 1998, No VIII-787, amended in July 2002
- Waste management regulations (WMR) approved by the Minister of the Environment of the Republic of Lithuania, Decree No 217, 14.7.1999

References

[1] *2002 Regular report on Lithuania's progress towards accession*, European Commission, 2002

[2] *Environment 2000, Part II: State of the environment, main change trends and protection measures*, Ministry of the Environment of the Republic of Lithuania, Vilnius, 2001

[3] *State of the environment 2001*, Ministry of the Environment of the Republic of Lithuania (http://www.am.lt/EN/VI/files/0.919984001036055560.pdf)

[4] *Second Baltic state of the environment report based on environmental factors*, Baltic Environmental Forum, Riga, November 2000

[5] Waste management legislation and its implementation in Lithuania, Cepele/Brazas, Ministry of the Environment, 2002 (http://matdb.jrc.nl/prewin/Dec2002/pres/Lithuania-Wastemanagement.pdf)

[6] The *acquis* implementation action plan for 2002–03' (http://www.am.lt/EN/VI/article.php3?article_id=13)

[7] Eurostat/OECD joint questionnaire (JQ) on waste

Poland

Basic information

With an area of 312 685 km² and a population of 38.6 million inhabitants Poland is the biggest of the candidate countries. The resulting population density is 124 persons per km². The population development has remained at a constant level over the last few years.

The country has a variety of natural resources including coal, copper, zinc, iron, gypsum, lignite and some oil and natural gas reserves. The rapidly developing private sector is now responsible for 70 % of the country's economic activities. Dominant industries include metalwork, steel, chemical and textile production. The service sector is increasingly important for employment and for the restructuring of the national economy. Although about one fifth of the population is employed in agriculture, this sector contributes less than 4 % to the GDP [1].

Since the mid-1990s Poland has achieved considerable economic growth with growth rates above 6 %. This has been interrupted by a sharp slowdown since 2001. Poland's per capita GDP lies slightly above the average for the candidate countries.

In 1999, a new three-level territorial system of the State administration authorities was put in place. The national territory has been structured into territorial units of voivodeships (regions), poviats (counties) and gminas (communes). Some 16 new voivodeships replaced the 49 old ones, including 314 poviats and 66 cities with poviat status (as of 31 December 2002). Poviats and cities with poviat status are subdivided into communes (gminas).

Table 2.23

Macroeconomic indicators for Poland

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	38 650	38 666	38 654	38 646	38 641
GDP at current prices (million euro)	127.1	141.3	145.5	170.9	196.7
GDP per capita [(a)] at current prices (euro)	3 300	3 700	3 800	4 400	5 100
Change of GDP over previous year (%)	6.8	4.8	4.1	4.0	1.1
Structure of production (% of gross value added)					
Agriculture	5.5	4.8	4.0	3.7	3.4
Industry	29.3	27.6	27.1	26.5	25.4
Construction	7.9	8.7	8.8	8.4	7.5
Services	57.2	59.0	60.1	61.4	63.8

(a) Figures have been calculated using the population figures from the national accounts, which may differ from those used in demographic statistics.

Source: *[2]*

Waste legislation

A number of primary and secondary legislative acts constitute the legal framework for waste management in Poland. Major improvements of waste legislation took place twice in the late 1990s.

- With the 1997 Waste Act, Poland introduced a permit system for the management of hazardous waste and for waste-generating economic activities.
- Full compliance with EU legislation was achieved by the adoption of the 2001 Waste Act (Act on Waste, Dz. U. 2001.62.628) together with other regulations. The permit system was extended to the management of non-hazardous waste [3].

Permits and licenses

The responsibilities with regard to issuing permits and controlling waste-generating activities are split up between the voivodeships (regions) and the poviats (counties), depending on a company's impact on the environment. For large facilities that are expected to have especially harmful effects on the environment, the voivodeships are authorised to administer the hazardous and non-hazardous waste permit procedure from application to permit issuance or denial. For other enterprises permits are issued by the poviats. The need for a permit depends on the amount of waste that is generated per year.

- Waste generators are obliged to obtain a permit if they produce more than 1 tonne/year of hazardous waste or more than 5 000 tonnes/year of non-hazardous waste.
- Enterprises that generate more then 0.1 tonnes/year of hazardous waste or more than 5 tonnes of non-hazardous industrial waste but fall below the limits mentioned above need a positive decision for their waste management programme.

Permits for recovery and treatment of hazardous and non-hazardous industrial waste are issued by the voivodeships if the activities may have significant effects on the environment. Oth-

erwise the permits for recovery and treatment are issued by the poviats. The poviats are also the competent authorities for permits on waste collection or transport.

Waste management activities according to the issued permits with regard to hazardous and non-hazardous industrial waste are controlled by the voivodeship inspectorates for environmental protection. The results of the controls are compiled in an annual report that is submitted to the national Chief Inspectorate for Environmental Protection.

Reporting obligations

The 2001 Waste Act stipulates an annual reporting obligation for waste holders (generators, collectors, waste holders conducting operations in the scope of waste recovery, treatment, or transport). The obligatory reports laid down by legislation on waste are the basis for a new administrative data collection system on waste generation and management which is currently under development.

So far, companies have been obliged to report to the statistical and monitoring systems depending on the type and amount of waste that is generated or stored. The following units had to report on their waste management:

- enterprises that generate annually more than 1 000 tonnes of non-municipal waste (all waste types covered by the waste classification with the exception of municipal waste);
- enterprises having 1 million or more tonnes of waste stored on their premises;
- enterprises generating annually more than 30 tonnes of hazardous waste.

The obligated parties have to fill in standardised survey forms and submit them to the competent authorities.

Waste classification

Since January 1998 Poland has used a waste classification that is harmonised with the European waste catalogue and the hazardous waste list. Before 1998 surveys were conducted on the basis of a national waste classification which was quite different to the European one.

With the new regulation of the Minister of the Environment of 27 September 2001 on the catalogue of waste, the European waste list was adopted and came into force at the beginning of 2002.

Institutional framework

The **Ministry of the Environment (MoE)** is the main central institution for development and implementation of the national waste management policy.

The **Chief Inspectorate of Environmental Protection** works under the supervision of the MoE and is, *inter alia*, responsible for the implementation of the national environmental monitoring system and the management of environmental emergency protection. The Chief Inspectorate is the competent authority for the transboundary movement of waste and collects data on hazardous waste . It coordinates the activities that are carried out by the 16 voivodeship inspectorates.

The 16 **voivodeship inspectorates for environmental protection** (regional government) are responsible for implementation of legislation and take decisions on environmental investments. At their level, they are responsible for issuing permits and inspection. They collect data on hazardous waste and submit them to the Chief Inspectorate.

The **poviats** (counties) are responsible for the implementation of environmental policy at county level, including both permits and inspection.

The **Statistical Office (GUS)** carries out annual surveys on industrial waste, on municipal waste and on environmental expenditures. The surveys are based on the statistical programme that is elaborated annually by the Statistical Office and adopted by the Government. So far, the GUS has been the central body for the collection of data on industrial waste but responsibilities in this field are being reorganised.

Waste information collection

Up to now, the collection of data on industrial and hazardous waste has been split between the Statistical Office, which focuses on industrial waste, and the Chief Inspectorate for Environmental Protection which collects data on hazardous waste.

Industrial waste

Data on industrial waste are collected annually by the Statistical Office on the basis of the legal reporting obligations. Accordingly, the survey covers enterprises generating more than 1 000 tonnes or storing more than 1 million tonnes of non-municipal waste.

For the selection of the reporting units, special registers are created at the Regional Statistical Offices. The registers are updated annually. The survey includes enterprises that have their main economic activity in one of the NACE Sections 10 to 37 (mining/quarrying, manufacturing industry), 40 (energy production) or 41 (water supply). The survey does not cover the sectors agriculture and forestry.

The questionnaires on non-municipal waste (OS-6) are sent out to the reporting units annually, in December of the reporting year, and responses are expected by the voivodeship statistical offices by the end of January of the following year. The obligated parties have to report on the types and amounts of generated wastes and have to specify their treatment and disposal methods. The questionnaire distinguishes between recovery, composting, thermal treatment, landfilling, storage and other types of disposal. It does not refer to the R and D codes of the European waste framework directive.

Hazardous waste

Data on hazardous waste are collected annually by the Inspectorate for Environmental Protection within the framework of the State environment monitoring system (sub-system-waste) via the voivodeship inspectorates. The survey addresses all units generating more than 30 tonnes of hazardous waste per year. In addition, 10 % of hazardous waste generators which fall below the threshold are also surveyed.

The registers of reporting units for the hazardous waste monitoring survey are drawn up at the voivodeship inspectorates and are updated annually. Questionnaires are sent out in December/ January and responses are due by 15 March. The collected data do not refer to the classification of economic activities.

Outlook

In October 2001 the new Waste Act came into effect, considerably increasing the requirements on the scope of waste data col-

lected by administrative authorities. The new data collection and evaluation system is currently under development. It is envisaged that the statistical survey will be replaced by a new administrative system. The new system shall be based on information collected at the regional voivodeship level on the topics waste generation, collection, transport, treatment and disposal. Data on treatment operations will refer to the R and D codes as defined by the European framework directive. The information will be submitted to the Ministry of the Environment where the central database system shall be operated. The data will be used for statistical purposes, reporting, waste management planning and for the permit system.

The first data collection according to the new system is to be carried out in 2003. It is assumed that both data systems, the statistical and the administrative one, will work in parallel for two to three years. The statistical system will be phased out subsequently.

Data on waste management

Waste generation

In Poland, regular surveys on waste generation have been carried out for a long time. Annual data on waste generation specified according to economic sectors, have been available since 1980. Data until 1997 were based on the former national waste catalogue. Since 1998, the classification has been in line with the European waste catalogue (EWC) and the hazardous waste list (HWL). Starting with the reference year 2002, the European waste list will be applied.

Industrial waste

Poland started monitoring the generation of industrial waste according to economic sectors in the 1980s. The figures for the years 1991 to 2001 are shown in Figure 2.18. Generation of industrial waste has been quite steady in this period. The most significant change took place between 1997 and 1998 and is most likely due to the introduction of the EWC-based waste classification.

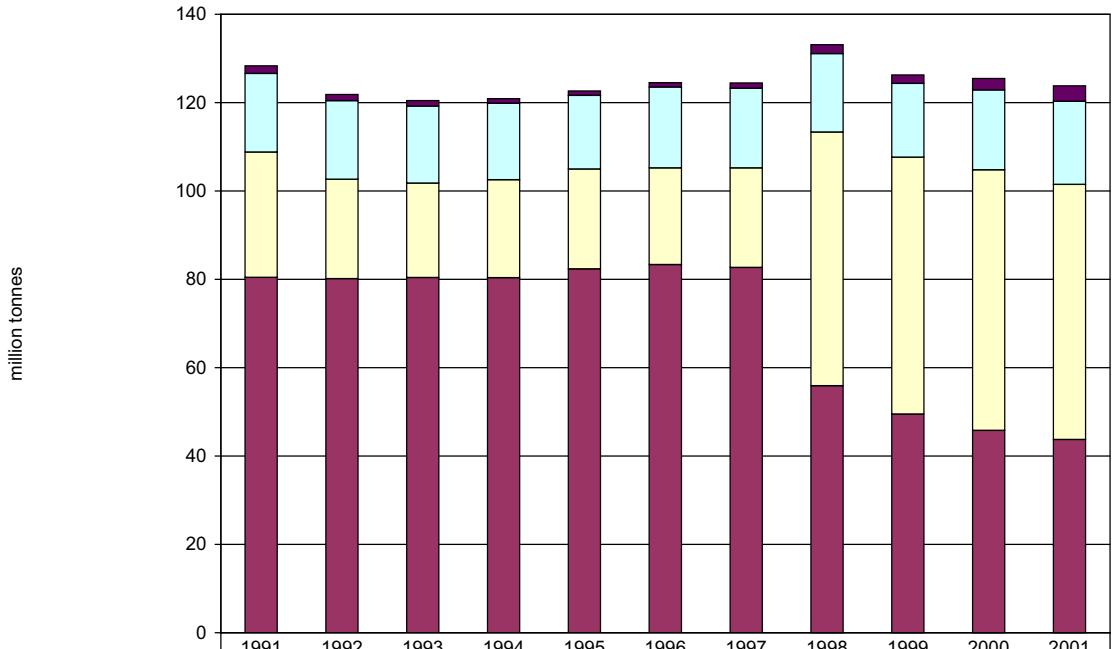
Apparently, the new classification led to a higher industrial waste total and to considerable changes for some economic sectors. For the manufacturing industry the change of classifications resulted in a doubling of reported amounts. This is due to the fact that the EWC is broader than the former national classification and contains types of waste that were not covered before.

Since 1998, industrial waste generation has decreased slightly. Figure 2.18 shows a continuous decrease of mining and quarrying waste that reflects the declining coal production. This trend is likely to continue.

In 2001, Poland had to deal with a total of 134.9 million tonnes of waste. Industrial waste amounted to 123.8 million tonnes and accounted for 91.8 %. Municipal waste generation was 11.1 million tonnes. As shown in Figure 2.19, nearly half of the generated industrial waste, namely 46.6 %, results from activities of the manufacturing industry, in particular from the non-ferrous metal industry, the chemical industry and the food and drinks sector. Coal mining waste and other mining and quarrying wastes account for 35.3 % of the generated total. Ash and slag form power plants, hard coal fly ash and other wastes form energy production contribute a share of 15.2 %.

Figure 2.18

Development of industrial waste generation in Poland



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Other sectors	1,7	1,4	1,3	1,0	1,0	1,0	1,2	2,0	1,9	2,6	3,5
Energy production	17,8	17,8	17,4	17,3	16,6	18,3	18,0	17,8	16,7	18,1	18,8
Manufacturing industry	28,4	22,5	21,4	22,2	22,6	21,9	22,5	57,4	58,2	59,0	57,7
Mining and quarrying	80,4	80,1	80,4	80,4	82,4	83,3	82,7	55,9	49,5	45,8	43,7

Figure 2.19

Breakdown of industrial waste generation in Poland by economic sectors in 2001

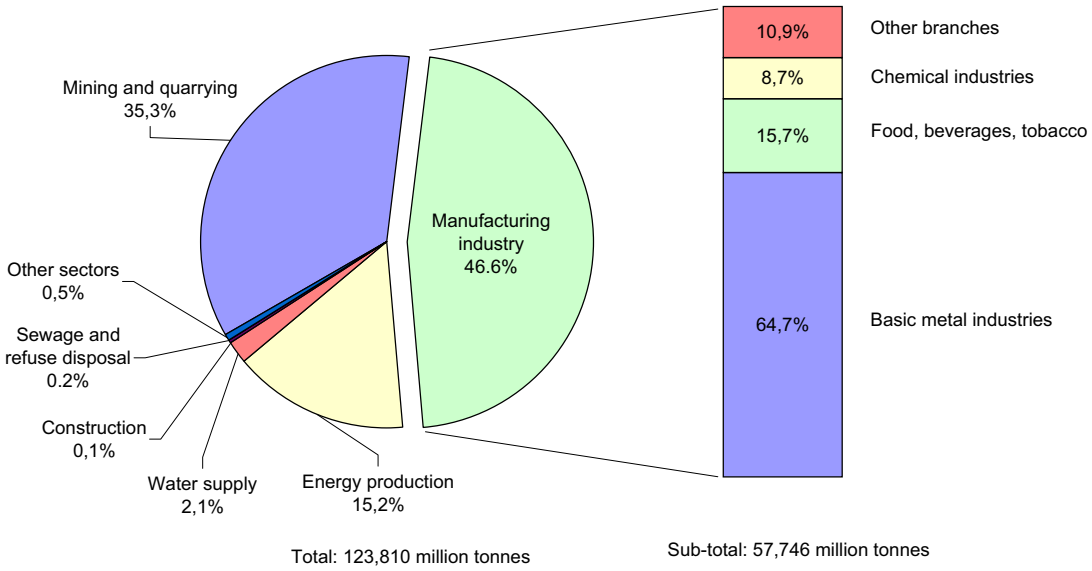
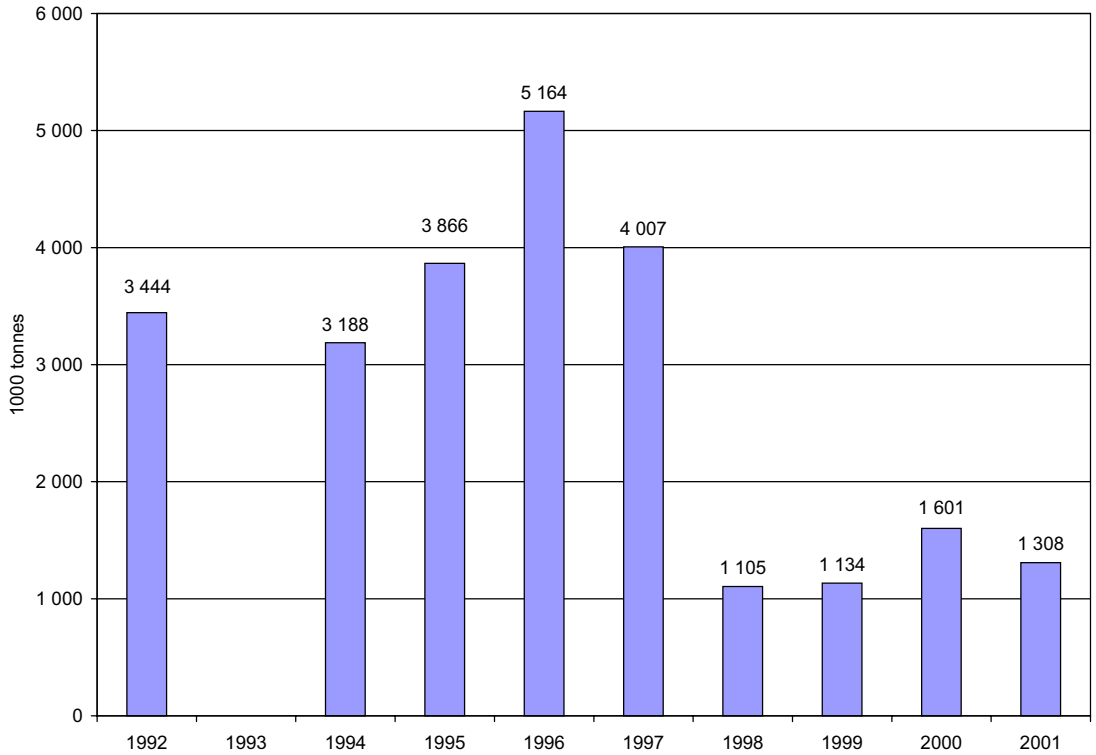


Figure 2.20

Development of hazardous waste generation in Poland



Comparison with other candidate countries shows some particularities. While the per capita generation of industrial waste of 3.2 tonnes is similar to that of the Czech Republic (3.3 tonnes) or the Slovak Republic (2.5 tonnes), considerable differences

consist for individual economic sectors. While the waste generation in the manufacturing and in the mining industry is high compared to other countries, very low figures are reported for the construction sector and for activities related to sewage and waste disposal.

Hazardous waste

Figure 2.20 shows the development of hazardous waste generation in the period from 1992 to 2001. Fluctuation of quantities is higher than for the industrial waste total. Again, the impact of the replacement of the national classification by the EWC/HWL-based catalogue is clearly visible. It led to a reduction of recorded hazardous waste amounts by 75 %. A clear tendency of hazardous waste generation is not visible. So far, data on hazardous waste generation have not been not collected according to economic activities. The available data give no information on the generating sectors.

For 2001, a total of 1.3 million tonnes of hazardous waste was reported which corresponds to a rather low share of 1.1 % of the industrial waste total. The per-capita generation of 34 kg hazardous waste per year is similar to that of Slovenia (34 kg), Latvia (35 kg) and Romania (40 kg).

Waste treatment

Data collection in Poland focuses on waste generators. Data on waste treatment and disposal are sketchy. The data requirements of the joint questionnaire on this subject are only partially satisfied. No data are available on the number and capacity of treatment and disposal facilities for hazardous waste. There are further data gaps with regard to the specification of recovery and disposal operations for non-hazardous but also for hazardous waste (see Table 2.24 and Table 2.25).

Table 2.24
Treatment and disposal of non-hazardous waste from the manufacturing industry in 2001

	1 000 tonnes	%
Total amounts generated by manufacturing industries [(a)] of which designated for	57 746	100.0 %
Recovery operations		
Recycling		
Incineration with energy recovery		
Disposal operations		
Incineration without energy recovery	208	0.4 %
Landfill total amounts	10 173	17.6 %
of which controlled landfill	10 173	17.6 %

(a) The given total does not necessarily equal the sum of recovery and disposal operations.

Recovery

Out of the 124 million tonnes of industrial waste generated in 2001, 97 million tonnes (78 %) were recovered. Over 50 % of the recovered materials was used as secondary raw material for industrial purposes, including the use for generation of power and for construction. Since 1990, the recovery rate has grown steadily from 54 % to 78 % in 2001 and was accompanied by a decrease in the share of landfilled industrial waste. According to the OECD's review report 2003 on Poland [3], recycling rates have increased considerably in the mining/quarrying and utility sector while progress in other sectors has been slow.

For hazardous waste, data on recovery are collected but not specified according to individual recovery operations. The figures for the year 2001 are shown in Table 2.25. Of the hazardous waste total of 1.3 million tonnes, 406 000 tonnes were recovered. This corresponds to a recovery rate of 31 %.

Incineration

In Poland, incineration capacities for thermal treatment of non-hazardous waste are still low. The first and currently only municipal waste incineration plant started operation in 2000 [3]. Plans to construct further incineration plants face strong public opposition. The available incineration capacity amounts to 259 000 tonnes per year (see) which corresponds to far less than 1 % of the total waste arising of the same year. Of the waste from manufacturing industry, 208 000 tonnes or 0.4 % were incinerated in 2001. No information is available on the extent of the use of waste in industrial incineration facilities.

Table 2.25
Treatment and disposal of hazardous waste in 2001

	1 000 tonnes	%
Total amount generated	1 308	100.0 %
Recovery operations total, of which	406	31.0 %
Incineration with energy recovery (R1)		
Recycling, composting, etc. (R2-6)		
Other recovery operations (R7-11)		
Preparatory activities (R12-13)	37	2.8 %
Disposal operations total, of which	902	69.0 %
Physico-chemical treatment (D9)		
Biological treatment (D8)		
Direct incineration without energy recovery (D10-11)		
Landfill and other deposit into or onto land (D1-5)	63	4.8 %
Release into water bodies (D6-7)		
Permanent storage (D12)		
Preparatory activities (D13-15)		

No data are reported on incineration facilities for hazardous waste. According to the OECD review report, major developments regarding hospital waste management took place in the 1990s. Some 23 regional incinerators for hospital waste were built between 1994 and 1999 to replace over 300 small incinerators without pollution control equipment. Although seven of the new modern incinerators never became operational, the incineration capacity exceeds the actual requirements and the average utilisation rate is 30 % [3].

Landfills

In Poland, 1 408 landfills for non-hazardous waste were registered in the year 2001 (see). According to the OECD, technical conditions and maintenance of the landfills for municipal waste is generally unsatisfactory. As of 2000, less than half of the municipal landfills were equipped with leachate and rainwater drainage systems and 21 % had gas venting or recovery capability. Only 70 % of landfills kept records on deposited waste [3].

Landfills for non-municipal waste are owned and maintained by large industries. Most do not meet EU technical standards, although the compliance rate of non-municipal sites is generally higher than that of municipal sites. Government authorities expect full compliance by 2009 [3].

As already outlined above, the volume and share of landfilled industrial waste decreased continuously during recent years. For non-hazardous waste from manufacturing industries the share of waste disposed of on controlled landfills decreased form 26 % in 1995 to 18 % in 2001 (see Table 2.24).

For hazardous waste a similar development is reported. The proportion and volume of hazardous waste sent to landfills decreased in the 1990s and reached 5 % (63 000 tonnes) in 2001 (see Table 2.25). However, no data are reported on operating landfills for hazardous waste.

Table 2.26

Waste treatment and disposal installations for hazardous and non-hazardous waste in 2001

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)			
Capacity (1 000 tonnes)	3 414[(a)]		
Incineration plants			
Number (n)			
Capacity (1 000 tonnes)	259		
Landfill sites			
Number (n)	1 408		
Remaining capacity (1 000 tonnes)			
Permanent storage			
Number (n)			
Capacity (1 000 tonnes)			
Other			
Number (n)			
Capacity (1 000 tonnes)			

(a) Data refer to waste treated in ways other than landfill and incineration.

Import and export

Poland entirely prohibited the import of hazardous waste until 2001, when some recoverable types of hazardous waste were allowed to be imported. Legally authorised export of hazardous waste for safe disposal is limited to certain types of waste and specific countries (for example, asbestos and pesticides to Germany, PCBs to France). Hazardous waste imports and exports have to be authorised by the Chief Inspectorate for Environmental Protection. In 1999, the exports amounted to 14 000 tonnes [3].

Institutions and contacts

Institution	Contact
Ministry of the Environment	www.mos.gov.pl
Chief Inspectorate of Environmental Protection	www.gios.gov.pl
Central Statistical Office (GUS)	www.stat.gov.pl

List of relevant regulations

- Environmental Protection Act of 27.4.2001, Dz.U.2001, No 62, item 627 (entered into force in October 2001)
- Act of 27.4.2001 on Waste, Dz.U. 2001, No 62, item 628 (entered into force in October 2001)
- Regulation of the Minister of the Environment of 27.9.2001 on the catalogue of wastes, Dz.U. 2001, No 112, item 1206
- Regulation of the Minister of the Environment of 11.12.2001 on the scope of information supplied at registration by owners of wastes excluded from the obligation of obtaining permits and methods of registration, Dz.U. 2001, No 152, item 1734
- Regulation of the Minister of the Environment of 11.12.2001 on the types of wastes or quantities of wastes for which there is no obligation to record wastes and categories of small and medium-sized enterprises which may use simplified records of wastes, Dz.U. 2001, No 152, item 1735
- Regulation of the Minister of the Environment of 11.12.2001 on the format of documents used in wastes registration, Dz.U. No 152 item 1736
- Regulation of the Minister of the Environment of 11.12.2001 on the scope of information and format of documents used for preparation and submission of summary set of data, Dz.U. 2001, No 152, item 1737

References

[1] European Commission, Enlargement DG (http://europa.eu.int/comm/enlargement/poland/index.htm)

[2] *2002 Regular report on Poland's progression towards accession*, European Commission, October 2002

[3] *OECD environmental performance reviews Poland*, OECD Paris, 2003

Romania

Basic information

With an area of 238 391 km² Romania is the second largest of the candidate countries. Romania has a population of 22.4 mil-

lion. The Carpathian Mountains cover 30 % of the country's surface. Administratively, the country is divided into eight development regions, 42 judets (counties), and 2 951 towns and communes.

Romania is rich in industrially important natural resources like crude oil, timber, natural gas, brown coal, lignite, ferrous and non-ferrous ores, gold, silver, bauxite ore deposits and salt reserves. Most coal reserves and oil deposits are found along the mountains and the judets of Bacau and Prahova are well known for their oil refineries. In 1981, oil was also discovered in the Romanian part of the Black Sea [1].

Before 1989, Romania's economy focused on heavy and energy-intensive industry. This led to the depletion of natural resources and energy shortages and, subsequently to a heavy dependence on imports of energy and raw materials. So by 1997, 30 % of commercial energy was imported [1].

Table 2.27

Macroeconomic indicators for Romania

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	22 546	22 503	22 458	22 435	22 408
GDP at current prices (million euro)	31.2	37.4	33.4	40.2	44.4
GDP per capita at current prices (euro)	1 400	1 700	1 500	1 800	2 000
Change of GDP over previous year (%)	– 6.1	– 4.8	– 1.2	1.8	5.3
Structure of production (% of gross value added)					
Agriculture	19.6	15.8	14.7	12.2	14.6
Industry	33.5	29.1	27.7	28.2	28.5
Construction	5.7	5.5	5.6	5.6	5.5
Services	41.8	49.3	51.8	54.0	51.3

Source: *[2]*

After a strong economic decline in the early 1990s, GDP started to increase slowly in Romania after 1992. This period of growth was followed by a negative growth rate between 1997 and 2000. Since mid-2000, however, macroeconomic trends have improved distinctly. Growth has resumed and inflation declined. However, Romania has not made progress in real convergence with regards to capita income levels. Romania has, together with Bulgaria, the lowest GDP per capita of the candidate countries [2].

Waste legislation

The provisions of Directive 75/442/EEC have been transposed into national legislation by Law No 426/2001 for the completion and approval of Emergency Ordinance No 78/2000 on waste regime. The same law has created the framework for the adoption of other legislative acts in order to regulate the waste field in a global and unified manner.

Permits and licenses

Law No 426/2001 stipulates that entities that carry out recovery or disposal operations listed in Annexes IIA or IIB of the law [(1)] need to have an environmental permit. The permit has to include information on types and quantities of managed wastes, on the treatment, recovery and disposal operations applied, and on technical requirements and safety measures. Permits are issued by the environmental protection agencies (EPAs) operating under the Ministry of the Environment for a period of up to five years (Article 11, Law No 426/2001). Waste generators that are treating or disposing of their own wastes on their own premises are not obliged to obtain a permit, provided that they already have an environmental permit for another field of activity (Article 12, Law No 426/2001).

A permit is also needed by collectors and transporters of hazardous waste. Permits for hazardous waste collectors are issued by the EPAs whereas the Ministry of Transport is responsible for the authorisation of hazardous waste transporters. Transporters of non-hazardous waste are not subjected to authorisation but have to notify the competent authority (Article 13, Law No 426/2001).

New industrial facilities need to obtain an environmental permit based on an environmental impact assessment procedure. According to the amended Ministerial Order No 125/1996 for approving the assessment of environmental pollution, the identification of the amounts and sources of industrial waste generated at the industrial facilities are part of the assessment [1].

A register on the permitted entities is kept by the waste and hazardous chemicals departments of the local environmental protection agencies.

Record-keeping and reporting obligations

Records have to be kept by waste producers, collectors, transporters, and entities that carry out recovery and disposal operations. The records have to contain information on quantity, nature, origin, and — if applicable — on destination, collection frequency, means of transport and treatment methods. The specified information has to be submitted to the competent authority on request (Article 15, Law No 426/2001, Government Decision No 856/2002).

Each institution and company that receives questionnaires from the environmental protection agencies is obliged to answer in accordance with Government Decision No 9/1992 and Law No 11/1994 on Public Statistics, Government Decision No 856/2002 and Emergency Ordinance No 78/2000. These legal acts stipulate penalties both in case of refusal or delay of data trans-

(1))The operations listed in Annex IIA and IIB comply with the recovery and disposal operations as defined in the European framework directive on waste (75/422/EEC).

mission and in case of wrong or incomplete data.

Waste classification

In Romania waste statistics were introduced in 1993 using a Romanian waste catalogue (1993–95). Since 1995 the waste statistics have been based on the European waste catalogue, although the official adoption of the European classification system was only issued in Government Ordinance No 155 in 1999.

The European waste list has been transposed into Romanian law in 2002 by Government Decision No 856/2002 on keeping records on waste and on introducing a new waste list. The first survey according to the European waste list is to be carried out in 2003 with 2002 as the reference year.

Institutional framework

The main national administrative institution for waste management is the **Ministry of Agriculture, Forests, Water and Environment (MoAFWE)** through its Directorate of Hazardous Substances and Waste Management. The former Ministry of Water and Environment Protection (MoWEP) was incorporated into the Ministry of Agriculture, Food and Forests in 2003.

The **National Research and Development Institute for Environmental Protection (ICIM)** is coordinated by the Romanian Ministry of Agriculture, Forests, Water and Environment and performs research and studies in the field of environmental protection and engineering. ICIM is the central body for waste data collection in Romania. It has monitored waste arisings and management since the early 1990s and manages the Romanian database on waste. ICIM reports in different forms to the MoAFWE, to the National Statistical Institute and to international bodies like Eurostat, UNEP and Basle Convention Secretariat. Furthermore, ICIM is the national reference centre on waste in the EIONET.

On the county level, the 42 **environment protection agencies (EPAs)** (formerly called environmental protection inspectorates) are responsible for issuing permits, inspection, enforcement and monitoring. They keep the registers on permit-holding entities and carry out waste data collection in cooperation with ICIM. Their responsibilities are set up by the MoAFWE through ministerial orders.

Romania plans to establish an **Environmental Agency** that shall take over, among other tasks, the collection of waste data. The Agency is currently under preparation. The starting data and the final profile of the Agency are still under discussion.

Waste information collection

The annual data collection on hazardous and industrial waste is based on questionnaires that are sent to waste producers and waste management companies in each county/judet in Romania by the 42 local environmental protection agencies. Operators, to which the questionnaires are sent, are selected by the local EPAs, based on the environmental impact of the companies, thus including all relevant actors. In 2001 and 2002, about 6 000 companies were addressed. The EPAs submit the data in electronic format to the Solid Waste Department of ICIM, where they are processed.

There are five different types of questionnaires addressing the following issues:

Questionnaire	Description
Generation of waste (Form: GD-PRODDES 1)	• addressed to waste producers in industry and agriculture, including mining and construction; • asks for waste generation, measurement methods (weighing or estimation) and for the treatment methods, including data on the enterprises own disposal sites.
Collection and management of municipal waste (Form: GD-MUN 2)	• addressed to municipalities or sanitation companies; • asks for municipal waste arising distinguishing between household waste, commercial waste and waste from municipal services.
Recycling of waste (Form: GD-RECIC 3)	• addressed to recycling companies; • contains questions on the type and amount of collected and treated waste, the way of treatment or sorting and the storage of waste.
Disposal of waste in landfills (Form: GD-DEPOZ 4)	• addressed to landfill operators, which are not waste producers or municipal waste operators; • asks for the type and amount of waste being landfilled and the characteristics of the landfill.
Incineration of waste (GD-INCIN 5)	• addressed to operators of incinerators, which are not waste producers in industry; • asks for the type and amount of waste being incinerated, the amount of residues produced and the type of the incinerator.

Pilot project

In 2002, ICIM has started a pilot project as part of the Phare multi-country project to raise the accuracy of data on hazardous waste generation and management facilities and to improve the data quality at the national level. A survey was carried out on waste generation and management in oil refineries and chemical and petrochemical industries, which are important hazardous waste generating sectors in Romania. To improve insight into waste and material flows in these sectors a special questionnaire was designed. In addition to data requests of the usual annual reports, the questionnaire asks for information on the raw materials used, the technical processes that generate the waste, the products and by-products obtained, the available waste treatment facilities and other issues. The survey covered all eight Romanian oil refineries and 13 chemical plants representing 70 % of the chemical industry. The survey revealed that 90 % of the hazardous waste contractors was not licensed by the EPAs. In addition, the reported figures showed that in the regular annual surveys the landfilled amounts were overestimated whereas the quantities of sludge were underestimated.

The survey was also the first trial with the application of the new waste classification based on the European waste list (EWL) in Romania. It turned out that the companies had problems with the classification of hazardous wastes and the use of the mirror entries of the EWL. In order to help companies a 'Guidance note for the identification of hazardous waste according to the EWL' has been developed.

For the 2004 survey, collecting waste data on 2003, another pilot project is planned. The main objectives are the sampling of economic entities and the extrapolation of data, and the modification of questionnaires with regard to data requirements for local and regional waste management plans.

Data on waste management

Waste generation

Romania has collected data on waste generation regularly since 1993. Since 1995, data has been collected according to a classification based on the European waste catalogue (EWC), and the methodology has been improved and adapted to European requirements steadily. As a result, a comprehensive and homogeneous set of data is available from 1995 to 2000 without major breaks in time series. The latest data reported to Eurostat refer to 2000. Additional information is available from the draft national strategy for waste management in Romania [3].

Industrial waste total

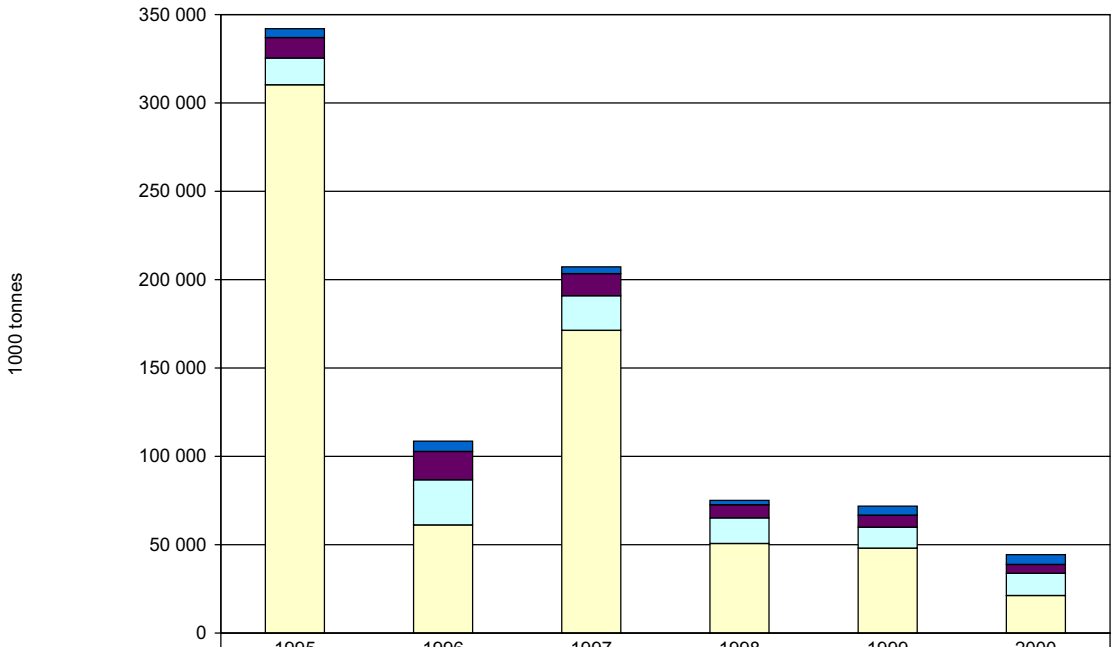
For the year 2000, Romania had to deal with a total of 55.8 million tonnes of waste. Industrial waste accounted for 44.4 million tonnes or 79.5 % of total waste produced. Another 3.5 million tonnes or 6 % were generated in agriculture. Municipal waste amounted to 7.96 million tonnes corresponding to 14 % of the generated total. Due to the lack of weighing facilities in Romania these figures are to a large extent based on volume estimation. Thus their accuracy is limited.

Figure 2.21 shows the development of industrial waste generation in Romania since 1995. The graph suggests a drastic decrease of industrial waste generation. This development is explained by the change in economic structure, namely the closing of mines and quarries and the reduction of activities in the steel industries, but also by the improvement of process efficiency in manufacturing industry and energy production. However, the strength of this effect is biased by the fact that since 1998 considerable amounts of excavation waste from mining and quarrying activities (EWC Section 01 01) have no longer been included in the reported amounts. In the period from 1998 to 2000, the reported amounts of waste from mining activities shown in Figure 2.21 consist mainly of waste of the EWC Sections 01 03 (waste from further physical and chemical processing of metaliferous minerals) or 01 04 (waste from further physical and chemical processing of non-metaliferous minerals).

Figure 2.22 displays the share of economic sectors in waste generation. In spite of the exclusions of excavation waste, mining and quarrying activities still account for about half of the generated industrial waste. Some 28 % of the industrial waste originates from the manufacturing industry (mainly the metal and the wood industry). Energy production contributes 11 % to the industrial waste total.

Figure 2.21

Development of industrial waste generation (including hazardous waste) in Romania



	1995	1996	1997	1998	1999	2000
Other sectors	5 036	5 834	3 904	2 592	5 198	5 622
Energy Production	11 573	16 031	12 485	7 428	6 811	4 977
Manufacturing industry	15 145	25 607	19 514	14 485	11 795	12 596
Mining and quarrying	310 230	61 099	171 326	50 611	48 050	21 214

Figure 2.22

Breakdown of industrial waste generation (including hazardous waste) by sectors in 2000

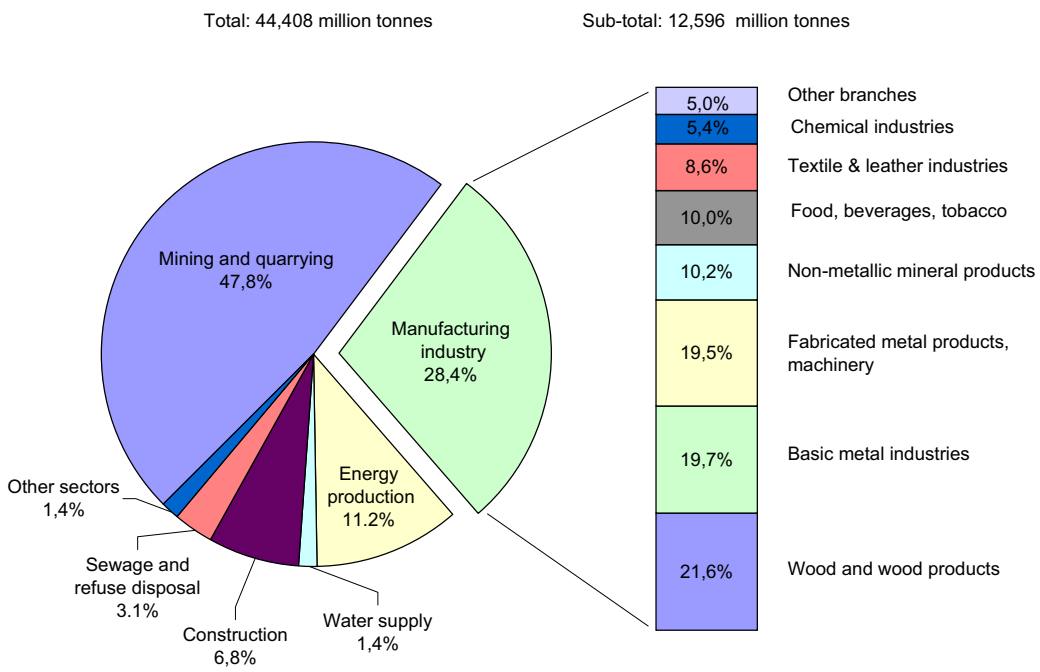


Figure 2.23

Development of hazardous waste generation in Romania

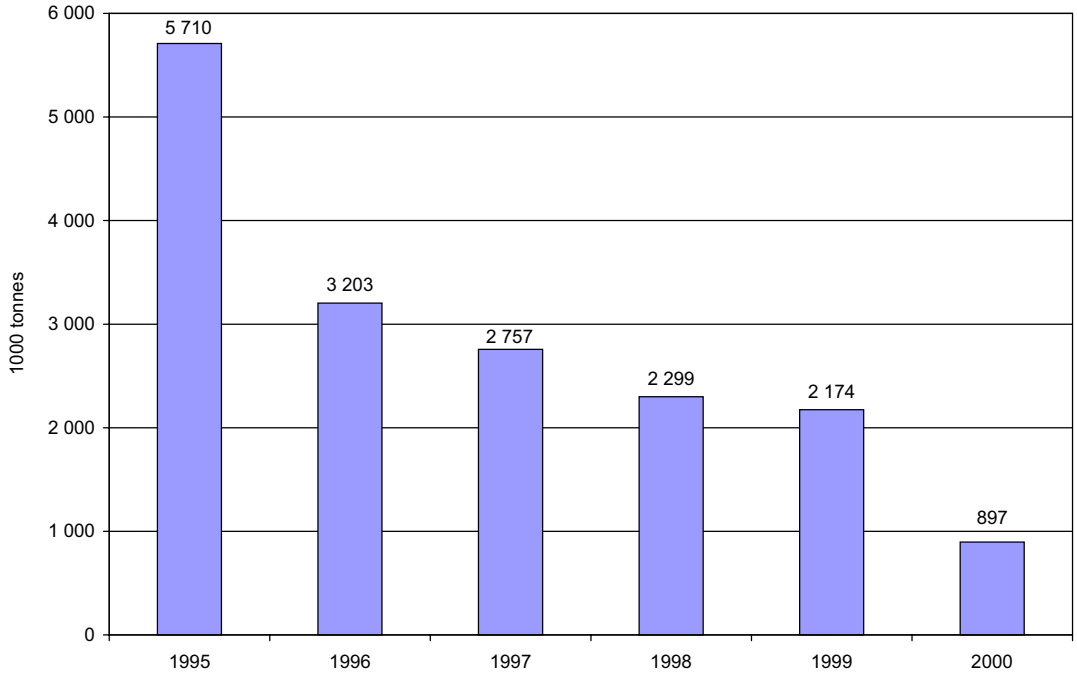
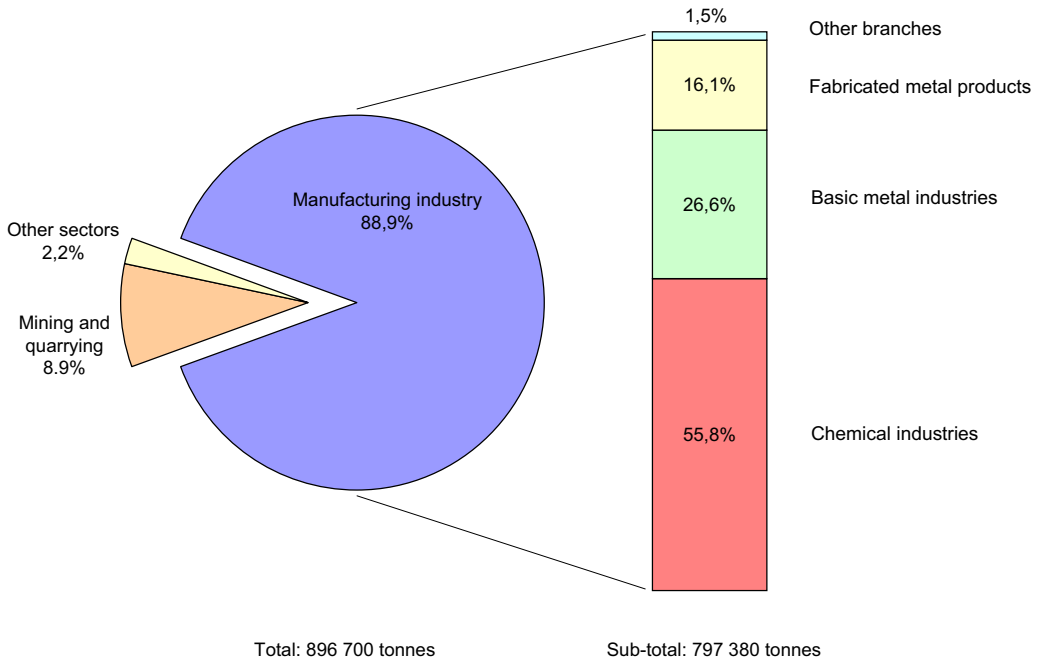


Figure 2.24

Hazardous waste generation according to economic sectors in 2000



According to the waste management strategy the main categories of generated waste are:

- waste from physical and chemical processing of minerals;
- bottom ash, slag and boiler dust from thermo-power and combustion plants;
- waste from inorganic and organic chemical processes;
- metallurgical slags and ashes from ferrous and non-ferrous metallurgy;
- residual sludge from industrial processes and wastewater treatment [3].

Hazardous waste

Figure 2.23 shows the development of hazardous waste generation in the period from 1995 to 2000. According to the reported data, the hazardous waste amounts shrunk continuously from 5.7 million tonnes in 1995 to 0.9 million tonnes in 2000. In 2000, three main chemical waste generators were not operating which might be one reason for the strong decrease from 1999 to 2000. The total hazardous waste arising in 2000 corresponds to 40 kg per capita, a figure which is similar to the amount for other candidate countries. In Romania, hazardous waste adds up to 2 % of the industrial waste total.

Figure 2.24 shows the origin of hazardous waste by sectors. By far the biggest share (almost 90 %) of hazardous waste is generated in the manufacturing industry. Major generating branches are the inorganic and organic chemical industry and the metal industry.

Only a few waste types account for the major part of the hazardous waste total. The largest amounts are represented by phosphogypsum (1), soda and soda/potassium hydroxides from the chemical industry [3].

Waste treatment and disposal

The figures reported to Eurostat on the treatment and disposal of non-hazardous manufacturing waste and on hazardous waste are shown in Table 2.28 and Table 2.29. Information on treatment and disposal facilities is presented in Table 2.30. Additional information was retrieved from the draft national strategy for waste management in Romania [3] and from the report 'Data on waste management in 2002' compiled by ICIM [4].

Non-hazardous waste

In Romania, usually about 25 % to 34 % of the non-hazardous industrial waste (excluding covering material from mining/quarrying) is recovered. About 55 % of this amount is recovered internally by the generating companies. The other 45 % is handed over to waste management companies, to production facilities that are using secondary raw materials and to individuals. In 2000, about 8.4 million tonnes of industrial waste were recovered. About half of this amount falls to the recycling of metals and metal compounds. The amount of recycled waste from the manufacturing industry is 2.3 million tonnes. The manufacturing industry achieves a recycling rate of 19.9 % (see Table 2.28).

(1) In Romania, phosphogypsum is classified as hazardous waste because it is radioactive on account of the used ore.

Energy recovery by co-incineration is carried out in numerous industrial installations like cement kilns, lime ovens and steel works. Depending on the data source, there are between 115 and 243 of such installations [3], [4]. The joint questionnaire reports that about 250 000 tonnes of non-hazardous waste from manufacturing industry was recovered energetically. This equals an energy recovery rate of 2.1 % (see Table 2.28). For the non-hazardous industrial waste as a whole, a higher energy recovery rate of 11 % is reported in the national strategy for the year 2000 [3].

Table 2.28
Treatment and disposal of non-hazardous waste from the manufacturing industry in 2000

	1 000 tonnes	%
Total amounts generated in manufacturing industries, of which designated for	11 799	100.0 %
Recovery operations		
Recycling	2 346	19.9 %
Incineration with energy recovery	250	2.1 %
Disposal operations		
Incineration without energy recovery		
Landfill total amounts	9 203	78.0 %
of which controlled landfill	300	2.5 %

Table 2.29
Treatment and disposal of hazardous waste in 2000

	1 000 tonnes	%
Total amount generated	897	100.0 %
Recovery operations total, of which	218	24.3 %
Incineration with energy recovery (R1)	9	1.0 %
Recycling, composting, etc. (R2-6)	144	16.0 %
Other recovery operations (R7-11)	43	4.8 %
Preparatory activities (R12-13)	22	2.5 %
Disposal operations total, of which	679	75.7 %
Physico-chemical treatment (D9)	40	4.5 %
Biological treatment (D8)		
Direct incineration without energy recovery (D10-11)	1	0.1 %
Landfill and other deposit into or onto land (D1-5)	386	43.0 %
Release into water bodies (D6-7)	4	0.4 %
Permanent storage (D12)	167	18.6 %
Preparatory activities (D13-15)	81	0.1

So far waste incineration plants for municipal and similar waste do not exist in Romania, but it is planned to construct at least three municipal waste incinerators by 2010 [3].

Landfilling represents the main disposal option for industrial waste and is applied for around 70 % of the total generated waste and for 78 % of the waste from manufacturing industry. The industrial waste management is organised by the generating enterprises that are using their own facilities or are handing over their waste to specialised companies. A significant part of production waste (about 2 million tonnes in 2000) is handled by the sanitation companies and deposited together with municipal waste [3].

In the joint questionnaire Romania reports that 512 landfills for non-hazardous waste and another 180 landfills for hazardous and non-hazardous waste were in operation in 2000 (see Table 2.30). This figure includes municipal landfills and landfills that are operated by industrial enterprises. In the national waste management strategy it is stated that most of the industrial landfills are dumps without special facilities. Only a few of them are in line with the requirements for environmental protection. Out of the total number of industrial waste deposits, only 30 % has been authorised by the environmental protection agencies [3].

Table 2.30
Waste treatment and disposal installations for hazardous and non-hazardous waste in 2000

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)			
Capacity (1 000 tonnes)			
Incineration plants			
Number (n)			
Capacity (1 000 tonnes)			
Landfill sites			
Number (n)	512	80	180
Remaining capacity (1 000 tonnes)			
Permanent storage			
Number (n)	250	200	
Capacity (1 000 tonnes)			
Other			
Number (n)			
Capacity (1 000 tonnes)			

Hazardous waste

Table 2.29 shows the data on treatment and disposal of hazardous waste in 2000. Of the hazardous waste total 24 % was recovered. Energy recovery is low and accounted for only 1 % of the generated total.

The major part of hazardous waste is landfilled (46 %) or permanently stored (18 %). Landfilling and storage takes place mainly on industrially owned sites, of which 80 are landfills for hazardous waste, 180 are landfills for hazardous and non-hazardous waste and 200 are permanent storage sites (see Table

2.30). These installations include deposits for metallurgical ash and slag, lagoons for chemical waste, settlement ponds and underground deposits [3].

The amount of hazardous waste that undergoes thermal treatment is low and amounted to only 1 000 tonnes in 2000 (see Table 2.29). According to the joint questionnaire, there are two hazardous waste incineration plants in operation (see Table 2.30). In addition, hospital waste is burned in about 330 crematories. These are small installations burning waste at temperatures of 200 to 400 °C without emission control systems [3].

Institutions and contacts

Institution	Contact
Ministry of Agriculture, Forests, Water and Environment	www.mappm.ro
National Research and Development Institute for Environmental Protection, ICIM	www.icim.ro
National Statistical Institute	www.insse.ro

Selected regulations

- Law No 137/1995 regarding the environmental protection (republished in 17.2.2000)
- Law No 426/2001 for approval and completion of the Emergency Ordinance No 78/2000 on waste regime
- Law No 465/2001 for approval of Emergency Ordinance No 16/2001 on industrial recyclable waste management
- Government Decision No 856/2002 on keeping records on waste and on introducing a new waste list

References

[1] *Environmental performance review of Romania*, UN-ECE, September 2001 (http://www.unece.org/env/epr/studies/romania/welcome.htm)

[2] *2002 Regular report on Romania's progress towards accession*, European Commission, October 2002

[3] National strategy for waste management in Romania', draft final report, May 2002

[4] Date privind gestionarea deseurilor in 2002, ICIM, Bucharest, 2003

Slovakia

Basic information

The Slovak Republic covers an area of 49 035 km^2. From the total area, agricultural soil makes up 50 %, forests 41 %, built-up area 4 %, water area 2 %, and other territories 3 %. The total number of inhabitants was 5.38 million in the year 2001. Some 42 % of the population lives in communities with over 20 000 inhabitants. Density of population is 110 persons per km^2. The population development remains at a constant level. The Slovak Republic is divided into eight regions and 79 districts.

Despite the political changes in 1989 and the collapse of heavy industries, mechanical engineering, the chemical and pharmaceutical industry, energy generation and metal production still account for the main share of industrial production.

The GDP per capita is slightly below the average for the candidate countries. The development of this indicator for the national economy in the period 1997–2001 is shown in the table below.

Table 2.31

Macroeconomic indicators in the Slovak Republic

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	5 383	5 391	5 395	5 401	5 380
GDP at current prices (million euro)	18.6	19.6	18.9	21.3	22.8
GDP per capita at current prices (euro)	3 500	3 600	3 500	4 000	4 200
Change of GDP over previous year (%)	5.6	4.0	1.3	2.2	3.3
Structure of production (% of gross value added)					
Agriculture	5.6	5.3	4.7	4.5	4.6
Industry	27.5	27.1	29.2	28.9	27.5
Construction	7.2	7.1	5.5	5.3	5.2
Services	59.8	60.5	60.7	61.4	62.7

Source: *[[1]]*

Waste legislation

The legal basis for waste management in Slovakia is the new Act of the NC SR No 223/2001 Coll. on Waste and on Amendment to Certain Acts, dated 15 May 2001 (Act on Waste). The Act on Waste regulates, *inter alia*, the operation of State administration bodies and municipalities, the rights and obligations of legal entities and individuals and the establishment of the recycling fund.

In addition, the decree of the MoE SR No 283/2001 Coll. on Implementing Certain Provisions of the Act on Wastes came into force in 2001. It regulates in detail:

- the contents of waste management plans;
- the procedure of keeping and maintaining records for different waste management operations;
- requirements regarding waste-handling and waste-handling facilities as well as details on the operation of waste-handling facilities.

According to decree of the MoE SR No 284/2001 Coll. a waste

catalogue was introduced in 2001 according to Commission Decisions 2000/532/EC and 2001/118/EC. The decree of the MoE SR No 284/2001 Coll. has been amended by the decree of the MoE SR No 409/2002 Coll. implementing all modifications of the new 'European waste list' (EWL) of the Commission Decision 2001/119/EC.

Permits and licenses

Regarding **non-hazardous industrial waste**, district authorities issue permits for waste treatment operators and keep registers of collectors and transporters who are obliged to register within 14 days since the beginning of their activity. A permit for generators of non-hazardous waste is not required.

Regarding **hazardous waste**, the district authorities (covered by the Ministry of Interior) issue permits on waste generation, waste collection and waste treatment operation. With regard to the transportation of hazardous waste there are different competencies: the district authority issues permits on the transport of hazardous waste within the territory of a district, a regional authority issues permits on the transport of hazardous waste crossing the territory of a district and of a region. The Ministry of the Environment issues permits on transboundary movements of wastes listed on amber and red waste lists according to the Basel Convention (decree of the MoE SR No 234/2001 Coll.).

In addition the waste management department of the Ministry of the Environment issues:

- permits for handling hazardous waste on mobile facilities;
- permits on the first introduction of a technology regarding hazardous waste-handling on the Slovak market.

The Centre of Waste and Environmental Management at the Slovak Environment Agency (SEA/CWEM) is keeping registers on waste generators, waste treatment operators, waste collectors and waste transporters. The registers are updated each year on the basis of the annual waste reports (see the following chapter).

Each business activity of legal entities and individuals e.g. handling of waste (hazardous and non-hazardous waste) has to be licensed. A trade licence authority covered by the Ministry of the Interior registers and issues licenses.

Record-keeping and reporting obligations

Pursuant to the decree of the MoE SR No 283/2001 Coll. every waste holder shall keep records according to the waste, regardless of the handled waste amount.

In cases where a waste holder handles annually more than 50 kg of hazardous waste or more than 1 000 kg of non-hazardous (other) waste, a report on waste generation and waste-handling has to be submitted by the waste holder to the competent authority (environmental department at district authorities). For this purpose a standardised form has to be filled in, which is shown as Annex No 4 in the decree of the MoE SR No 283/2001 Coll. In addition, there exists a reporting obligation, regardless of quantity, for selected hazardous waste types according to Annex No 5 of the decree of the MoE SR No 283/2001 Coll. (e.g. wastes containing halogens or heavy metals). Reports on waste generation and waste-handling shall cover the period of one calendar year.

Operators of waste recovery and waste disposal installations have to keep and retain records of quantity, type and origin of wastes taken over for recovery or disposal and of the means of their handling. In addition operators of hazardous waste shipment have to keep and maintain records on hazardous waste shipped. The operators are obliged to report the stipulated data to the competent district authority.

Waste classification

The Slovak waste classification system is in line with EU legislation. A waste catalogue according to EC Decision 2000/532/EC and Commission Decision 2001/118/EC was introduced in 2001. The corresponding decree of the MoE SR No 284/2001 Coll. has been amended by the decree of the MoE SR No 409/2002 Coll. implementing all modifications of the new 'European waste list' (EWL) of the Commission Decision 2001/119/EC.

Before that a national waste classification was used, based on the German LAGA system. A central part of that old classification system was to distinguish three main waste categories: 'hazardous waste', 'special waste' and 'other waste'. Under the term 'special waste' such wastes were summarised that require special handling particularly due to economic and environmental reasons. This system was not compatible with European classification systems which only distinguish 'hazardous waste' and 'non-hazardous (other) waste'. As a consequence, difficulties occurred during re-classification of 'special waste' to 'hazardous waste' or 'non-hazardous (other) waste', i.e. during filling in the OECD/Eurostat joint questionnaire (JQ).

Institutional framework

The **Ministry of the Environment (MoE)** is the central State administration body in waste management. Its duties are stipulated in paragraph 68 of the Act on Waste. For example, the MoE is responsible for control and supervision of State administration in waste management, to prepare and issue the national waste management plan and to administer the import, export and transit of wastes.

The **Centre of Waste and Environment Management at the Slovak Environmental Agency (SEA/CWEM)** is the national focal point of the Basel Convention as well as the Regional Centre of the Basel Convention for the central and east European region. The SEA/CWEM collects data and information on waste through the regional waste information system (RWIS) for compiling national statistics on waste and for updating the waste management programme. The SEA/CWEM evaluates latest information on best available technologies on waste management and consults administrative bodies and waste generators. It is in charge of the partial waste monitoring system (PWMS) and runs the hazardous waste information system (HWIS).

The **Statistical Office of the Slovak Republic** addresses reporting forms to relevant entities (waste generators) and performs an annual statistical survey on waste (hazardous and non-hazardous). This survey is independent of the waste reporting carried out by the Ministry of the Environment.

The duties and responsibilities of **regional authorities** are stipulated in paragraph 70 of the Act on Waste. Among other things, they prepare, issue and publish the regional waste management plan.

The duties and responsibilities of **district authorities** are laid down in paragraph 71 of the Act on Waste. Among other things, they prepare, issue and publish the district waste management plan. In addition, the district authorities perform the

registration of waste management companies as well as the procedure of granting authorisation for waste management activities.

Pilot project

Within the Phare multi-country statistical cooperation programme on hazardous and industrial waste, Slovakia conducted a pilot project which was entitled 'Implementation of the list of waste (LoW) in hazardous waste reporting in Slovakia — Direction fulfilment of EU reporting obligations (JQ and WSR)'.

The main objective of the pilot project was to compile and evaluate experiences in connection with the implementation of the new European waste list (EWL), at the administrational level and on the waste generator level. The project focused on hazardous waste. For this purpose a representative pilot region was selected where intensive work and research had been carried out. The gathered experiences as regards the EWL application and fulfilling of EU reporting obligations on waste statistics should be made available both, on national and international level.

The involved institutions were the Statistical Office of the Slovak Republic, the Ministry of the Environment of the Slovak Republic, the district authorities and the regional authority of a pilot region and the Slovak Environmental Agency represented by the Centre of Waste and Environmental Management in Bratislava, as the project leader. The project was finished in May 2003 and two independent outputs were provided.

- The final report entitled 'Implementation of list of waste in hazardous waste reporting in Slovakia — direction fulfilment of EU reporting obligations (JQ and WSR)' [2] evaluates the impact of the EWL implementation on balance of waste generation and handling in the pilot area and identifies the problems that occurred during the EWL implementation.
- The annex to the final report entitled 'From the national waste catalogue to the list of waste under the conditions of the Slovak Republic' [3] illustrates the legislative, administrative, institutional and information framework of processes and changes connected with the transition of national waste catalogue to the EWL.

Waste information collection [2], [3]

In the Slovak Republic there is a dual system of data collection on wastes. One waste survey is conducted under the coordination and supervision of the Statistical Office of the Slovak Republic (SOSR), the other survey is carried out by the Centre of Waste and Environment Management at the Slovak Environmental Agency (SEA/CWEM) using the regional waste information system (RWIS).

The two systems use different methodologies for data collection from the waste holders, e.g. they use different criteria (thresholds) for the selection of reporting units which have to be considered in the waste data surveys. The SEA/CWEM system uses a waste related threshold for the determination of reporting units: every waste holder that handles more than 50 kg hazardous waste or more than 1 000 kg of non-hazardous waste per year is obliged to submit a report on waste generation and waste-handling to the competent authority and is as such becoming part of the survey. In contrast the SOSR defines the threshold by the number of employees (companies with less than 20 and companies with more than 20 employees) and disseminates reporting forms, mainly to companies with more than 20 employees.

Survey on behalf of the Ministry of the Environment

For the collection of waste data on the territory of the Slovak Republic the regional waste information system (RWIS) has been working since 1995. Data on waste are primarily gathered by the environmental departments of district authorities. This district offices entered the data in the software RWIS, using local DOS versions. The data on diskettes were sent to the Centre of Waste and Environmental Management at the SEA/CWEM, where the data were processed on a central level.

In 2001 the RWIS was updated due to changes in the Slovak waste management legislation. In addition a new software was developed and tested in 2001 at five district offices and one regional office. Primary data collection has not been changed i.e. the environmental district authorities are still contact points. The new version of the RWIS, using both Internet and intranet technologies named RWIS-NET, has been in operation since 2002. The first data collection, covering the whole country, was carried out in 2003 (i.e. waste data for the year 2002).

Data from the RWIS is used for various purposes on national and/or international level. Outputs on national level are provided e.g. for bodies of State administration in waste management (MoE of the Slovak Republic, environmental departments of district and regional authorities) and other bodies of State administration, for waste holders/waste generators or for waste experts providing services in waste management. On the international level, outputs are provided to the Secretariat of Basel Convention, the OECD and to EU institutions, e.g. Eurostat and EEA.

Survey of the Statistical Office of the Slovak Republic [3]

The Statistical Office (SOSR) conducted the first survey on municipal waste in 1992. In 1993 an additional statistical survey was introduced on 'special waste' and 'hazardous waste' in industrial sectors (NACE 10–41), agriculture (NACE 01–05) and selected market services (NACE 70–72, 74, 80, 85, 90, 92, 93). In 1995/96 the survey was extended to further economic sectors: research and development (NACE 73), agriculture (NACE 01–05), forestry (NACE 02), industrial sectors (NACE 10–41), building industry (NACE 45), trade, hotels and restaurants (NACE 50–52, 55), selected market services (NACE 70–72, 74, 80, 85, 90, 92, 93), transport (NACE 60–63) and post and telecommunication (NACE 64).

Legal and physical entities authorised for business which generate waste are obliged to keep records of their wastes. The SOSR addresses standardised reporting forms to the relevant entities and performs an annual statistical survey on waste (hazardous and non-hazardous). This survey is independent from the waste survey realised by the Ministry of the Environment. Until 1996 two different reporting forms have been used, depending on the number of employees (below or above 20 employees). In 1996 the reporting form for small reporting units (companies) was cancelled due to low quantity of reported wastes. Since 2000, data has been collected, checked and processed with support of the software application DC 2000.

In 2000 and in 2001 the survey of the SOSR was adapted to new European requirements, developing modified reporting forms. The new reporting forms allow for the monitoring of the total

quantity of generated waste, classified according to waste categories (hazardous, other), waste-handling, i.e. waste recovery (material recovery, energy recovery, composting) and waste disposal (landfill, incineration without energy recovery and other disposal methods).

The SOSR issues yearly standard publications containing actual information on the status of the environment. The publication, *Statistical yearbook of the Slovak Republic*, contains data from different fields, including the environment. More specific publications are *Waste in the Slovak Republic* and *Selected indicators on environment in the Slovak Republic* or regional annual reports. Waste data are summarised at district, regional and national level according to NACE groups and regarding waste groups according to waste catalogue. The SOSR is the contact institution for international organisations in statistics and ensures statistical data of various fields, including waste management.

Conclusion

The different thresholds for the stipulation of reporting units in the two waste survey systems (waste amount, number of employees) lead to different coverage of the parent population within the waste surveys. Furthermore the two waste surveys follow different orientations regarding requirements of State administration. As a logical consequence both statistical systems produce different outputs on waste data regarding quantity and quality. Up to now the two systems are not harmonised. Following the outcomes of the above-mentioned pilot project (see Chapter 'Pilot Project') the regional waste information system (RWIS) appears to be more appropriate regarding the compilation of waste management statistics.

Data on waste management

Data on waste from obliged entities is primarily gathered at environmental departments of district authorities. The data is processed at the central level by the Waste and Environmental Management Centre of the Slovak Environmental Agency (SEA/CWEM) in Bratislava [[4]]. The Ministry of the Environment of the Slovak Republic fills in the joint questionnaire which is sent via the Statistical Office to Eurostat. The Statistical Office of the Slovak Republic is an official partner for Eurostat.

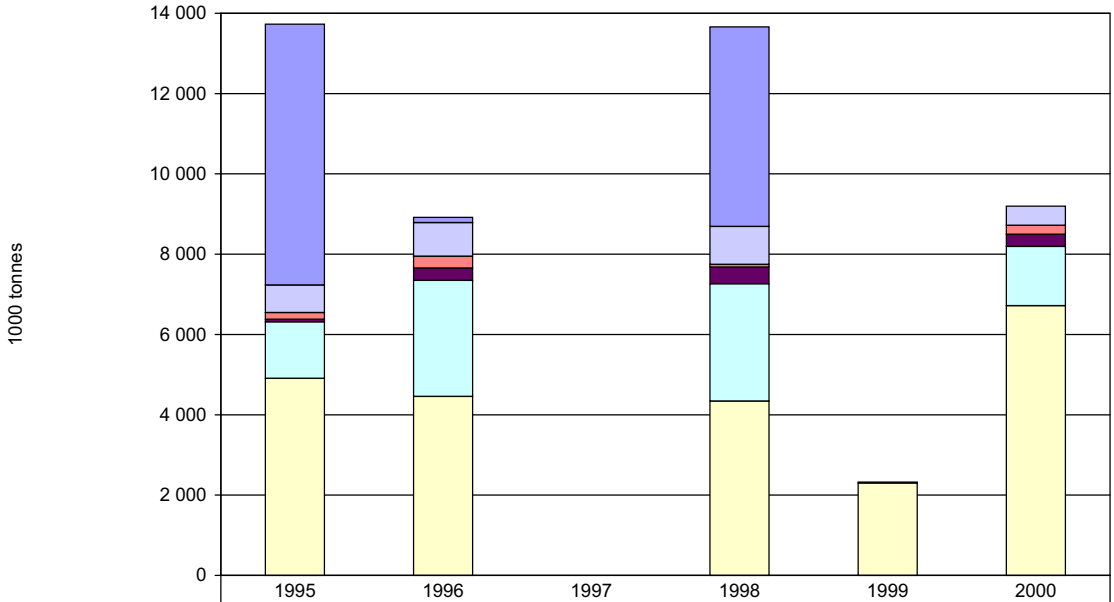
The joint questionnaire 2002 covers the years 1995–99 and partly 2000. The Centre of Waste and Environmental Management of the Slovak Environmental Agency (SEA/CWEM) in Bratislava provided additional data from the RWIS in 2003 for the year 2000. As the validated data for the year 1999 was rather incomplete, the following sections refer to the data of 2000.

Waste generation

The data on waste management is based on the 'old classification system' which distinguished three main waste categories: 'hazardous waste', 'special waste' and 'other waste'. As this system was not compatible with European classification systems, the category of 'special waste' had to be subdivided and allocated to 'hazardous waste' and 'non hazardous (other) waste'. This procedure of re-classification is difficult because it not only refers to waste amounts but also to the origin of waste as well as to treatment and disposal operations. In principle very detailed information on waste is available in the Slovak Republic. However, serious problems remain with regard to the aggregation of the available information on waste according to the reporting requirements of the joint questionnaire.

Figure 2.25

Development of industrial waste generation (including hazardous waste) in the Slovak Republic



	1995	1996	1997	1998	1999	2000
Other sectors	6 496	130		4 972		
Mining and quarrying	688	840		944		478
Construction	167	293		68	21	223
Water supply	64	308		417		302
Energy production	1 404	2 888		2 920		1 478
Manufacturing industry	4 909	4 458		4 342	2 302	6 715

Figure 2.26

Breakdown of industrial waste generation (including hazardous waste) by sectors in the Slovak Republic in 2000

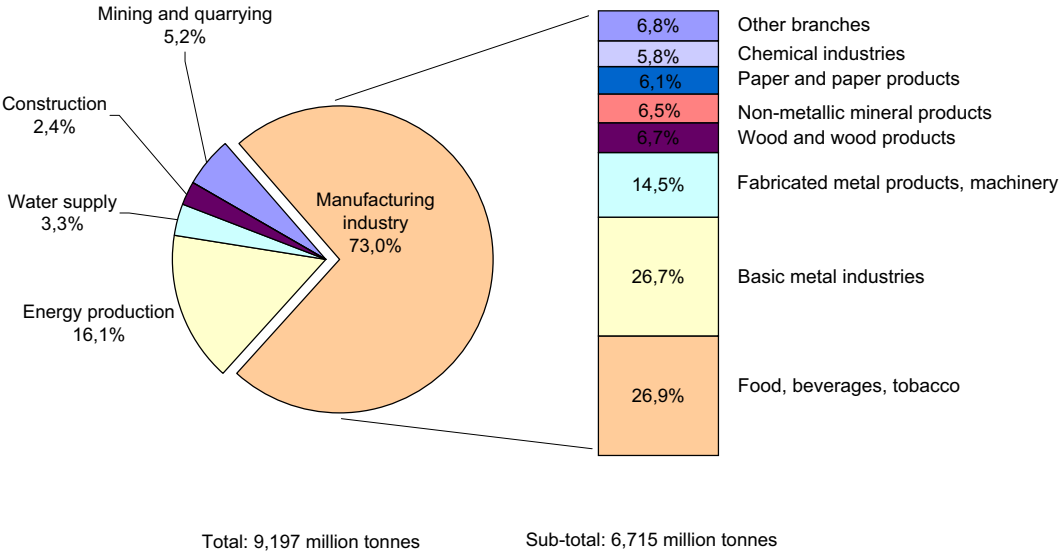
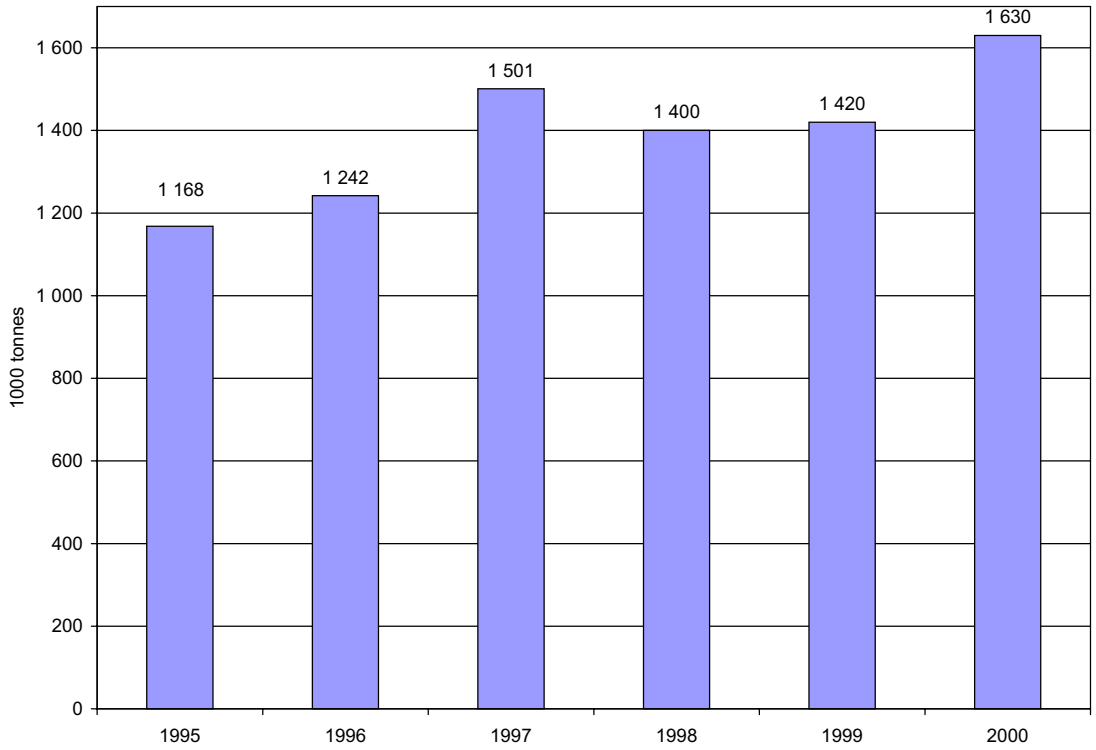


Figure 2.27

Development of hazardous waste generation in the Slovak Republic



Based on the above-mentioned re-calculation, the Slovak Republic reports for the year 2000 a total waste generation of 16.1 million tonnes. Industrial waste amounts to 9.2 million tonnes (57.5 %, see also Figure 2.25), municipal waste accounts

for 1.7 million tonnes (10.6 %) and waste from agriculture and forestry accounts for 5.1 million tonnes (32 %).

Figure 2.25 depicts the time series of industrial waste generation from 1995 up to 2000 as reported in the joint questionnaire. The years 1995 and 1998 show considerable waste amounts from 'Other sectors' which were not specified. Data for 1997 was not reported whereas data for 1999 is incomplete. The variations of waste amounts are caused by application of different waste classification systems. In addition, the data for the years 1996–99 are partly estimated because in this period no surveys had been conducted for the so called 'other waste'. Thus a definite description of the development of industrial waste for the period 1995–2000 is not possible.

Figure 2.26 depicts that in 2000 the industrial waste mainly consisted of waste from manufacturing industries (73 %). Waste from energy production amounted to 16 %, followed by waste from mining and quarrying (5 %), waste from water supply (3 %) and construction waste (2 %).

The breakdown of industrial waste by sectors in 2000 shows that waste from manufacturing industries is mainly generated by the industry 'food, beverages, tobacco' as well as metal works.

Hazardous waste generation

The development of hazardous waste amounts in the Slovak Republic is shown in Figure 3. Data for the years 1995–98 is based on the classification of Basel Convention, data for 1999 and 2000 is based on the national classification system.

The reported amounts of hazardous waste increased from 1995 to 2000 by 460 000 tonnes. However, this information does not correspond with those hazardous waste data, published in the waste management programme of the Slovak Republic [4]. The waste management programme displays a rather constant generation of hazardous waste on a level of about 1.5 to 1.6 million tonnes for the same time span.

In 2000 hazardous waste was mainly generated by manufacturing industry, predominantly by the branches 'Basic metal industries' (480 000 tonnes), 'Fabricated metal products, machinery' (184 000 tonnes) and 'Chemical industries' (119 000 tonnes) [4]. A comprehensive breakdown of the total hazardous waste amount in 2000 by sectors is not available because about 25 % of the generated hazardous waste can not be assigned to the generating sectors.

Waste treatment and disposal

Non-hazardous industrial waste

Data on recovery and disposal operations of non-hazardous waste in the Slovak Republic have not been reported via the joint questionnaire.

In the Slovak waste management programme until 2005 [4], recovered and disposed waste amounts are depicted only for the total amount of waste in the Slovak Republic. Having re-calculated the data from the RWIS, from the total amount of 'special waste' (8.2 million tonnes in 2000) 8.0 million tonnes were reclassified as 'non-hazardous (other) waste' in accordance with the new waste classification — the decree of the MoE No 284/2001 Coll. on Waste Catalogue. Some 165 000 tonnes were reclassified as 'hazardous waste'. According to the new waste classification the amount of non-hazardous (other) waste in 2000 is as follows: 6.3 million tonnes (original classification) plus 8.0 million tonnes (reclassified) totals 14.3 million tonnes. Based on this total of 14.3 million tonnes of non-hazardous (other) waste in 2000, 68 % was recovered, 32 % was assigned to disposal operations.

Hazardous waste

Data on recovery and disposal operations of hazardous waste in the Slovak Republic have also not been reported via the joint questionnaire. However, data on treatment and disposal of hazardous waste is provided by the waste management programme until 2005 [4].

After re-classification of 'special waste' according to 'hazardous waste' and 'other waste' for the year 2000 as mentioned above, 165 000 tonnes of 'special waste' were additionally re-classified as hazardous. Hence, the amount of hazardous waste in 2000 increased up to 1.792 million tonnes. Furthermore waste-handling after physico-chemical and biological treatment was considered during the re-classification. These measures led to the following shares for treatment and disposal operations in 2000: material recovery (16 %), incineration with energy recovery (2 %), incineration without energy recovery (3 %), landfilling (30 %) and other methods of waste-handling (49 %).

Table 2.32

Waste treatment and disposal installations for hazardous and non-hazardous waste in the Slovak Republic in 2000

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)	30	20	50
Capacity (1 000 tonnes)			
Incineration plants			
Number (n)	2	65	67
Capacity (1 000 tonnes)	219	273	492
Landfill sites			
Number (n)	100 (a)	41	141
Remaining capacity (1 000 tonnes)	26 358 (b)	5 139 (b)	31 497 (b)
Permanent storage			
Number (n)			
Capacity (1 000 tonnes)			
Other			
Number (n)			
Capacity (1 000 tonnes)			

(a) Remaining capacity in m³.
(b) Includes municipal waste, mineral (inert) waste, non-hazardous waste.

Waste treatment and disposal facilities

In the Slovak Republic a large number of waste treatment and disposal plants were in operation in 2000. For non-hazardous waste there are 30 treatment plants, two incinerators and 100

landfills available, for hazardous waste there are 20 treatment plants, 65 incineration plants and 41 landfill sites available.

The number of operating landfill sites is expected to decrease significantly by 97 until 2008. The main reason will be the exceeding of their capacity. After the year 2008, 43 landfills will be kept operating and will comply with technical standards [4].

Currently only 14 of 67 existing incineration facilities comply with emission limits stipulated by Decision 2000/76/EC. It is envisaged to reconstruct the two incinerators for municipal waste until 2005. Regarding hospital and hazardous waste, in 2006 only incinerators complying with this directive will be in operation [4].

Institutions and contacts

Institution	Contact
Slovak Environment Agency, Centre of Waste and Environmental Management	www.sazp.sk
Statistical Office of the Slovak Republic	www.statistics.sk
Ministry of the Environment	www.lifeenv.gov.sk/minis/

Relevant regulations

- Act of the NC SR No 223/2001 Coll. on Waste and on Amendment to Certain Acts, National Council of the Slovak Republic, 15.5.2001
- Order 283/2001 of the Ministry of the Environment of the Slovak Republic Implementing Certain Provisions of the Act on Waste, 11.6.2001
- Decree of the MoE SR 284/2001 on Waste Classification

References

[1] 2002 Regular report on Slovakia's progress towards accession, European Commission

[2] Implementation of LoW in hazardous waste reporting in Slovakia — Direction fulfillment of EU reporting obligations (JQ and WSR)', Final report, Centre of Waste and Environment Management at the Slovak Environmental Agency — SEA/CWEM Bratislava, Bratislava, 2003

[3] From national waste catalogue to LoW in conditions of the Slovak Republic, annex to the final Report 'Implementation of LoW in hazardous waste reporting in Slovakia — Direction fulfillment of EU reporting obligations (JQ and WSR)', Centre of Waste and Environment Management at the Slovak Environmental Agency — SEA/CWEM Bratislava, Bratislava, 2003

[4] Waste management programme of the Slovak Republic until 2005', Ministry of the Environment, Bratislava, 2002

Slovenia

Basic information

Slovenia has a population of nearly 2 million inhabitants and covers an area of 20 256 km². Ljubljana, the capital of Slovenia, has a population of 270 000 and is the largest city, followed by the city of Maribor with 110 000 inhabitants. Slovenia has a two-tiered administration with a national and a local level. The local level consists of 193 municipalities.

Table 2.33

Macroeconomic indicators for Slovenia

	1997	1998	1999	2000	2001
Population (in 1 000 inhabitants)	1 987	1 983	1 986	1 990	1 992
GDP at current prices (million euro)	16.1	17.4	18.8	19.5	20.9
GDP per capita at current prices (euro)	8 100	8 800	9 500	9 800	10 500
Change of GDP over previous year (%)	4.6	3.8	5.2	4.6	3.0
Structure of production (% of gross value added)					
Agriculture	4.2	4.1	3.6	3.3	3.1
Industry	31.8	32.0	31.2	31.4	31.0
Construction	5.6	5.6	6.2	6.0	5.9
Services	58.4	58.3	59.0	59.3	60.1

Source: *[2]*

Within the former Yugoslav Federation, Slovenia had the most industrialised and advanced economy. However, after its declaration of independence in June 1991, Slovenia went into an economic recession with decreasing gross domestic product (GDP) and industrial output. Due to the Yugoslav self-management system (social ownership of enterprises as opposed to State ownership), Slovenia had more favourable conditions for adjusting to market-based economic development than other candidate countries emerging from tight central planning. Economic recovery started in the second half of 1993 [1].

Economic restructuring changed the sectoral distribution output in favour of the service sector. In turn, the share of industry and agriculture decreased. This slowdown affected almost all manufacturing industries except engineering. Engineering, especially machine and transport equipment building, remained an important branch of industrial activity and a major contributor to exports. It was followed in importance by the textile industry, the wood processing and the paper industry [1]. In recent years, Slovenia has achieved a constant economic growth between 3 % and 5 % per year and has by far the highest GDP per capita among the candidate countries.

Waste legislation

The Environmental Protection Act (OG RS 32/93, 1/96) is the legal basis for waste management in Slovenia. It includes definitions of wastes, as well as the tasks of public administrations and services. Furthermore, it lists the instruments available to the Ministry of the Environment, Spatial Planning and Energy (MESP) in waste management, and stipulates the development of a strategic waste management plan as part of the national environmental action programme (NEAP).

Waste management regulations are specified in the rules on waste management (RWM) (OG RS 84/98, 45/00, 20/01) that are based on Article 30 of the Environmental Protection Act. The rules on waste management came into effect in December 1998. They are in line with EU waste legislation and contain, *inter alia*, regulations on permits for waste related activities, record-keeping, reporting obligations and the classification of waste.

Permits and licenses

With regard to administrative approval of waste-related activities, the RWM distinguishes between permits and confirmations of a company's entry in the waste register of the Ministry of the Environment, Spatial Planning and Energy.

- Permits are required for operators of waste recovery and disposal facilities. The permits shall set out the types and quantities of waste to be treated, the treatment operations (pursuant to the R and D-operations listed in Annexes 4 and 5 to the RWM) and the facilities and plants. Waste generators that are exclusively recovering or disposing of their own non-hazardous waste on their premises are exempt from this regulation (Article 27 RWM).
- Confirmation of register entries are needed by waste collectors and transporters. A confirmation is also needed by waste generators who are recovering or disposing of their own non-hazardous wastes (see paragraph above) (Articles 24, 27, 34 RWM). Confirmations may refer to one or more waste types.

Both, permits and confirmations are issued by the Ministry of the Environment, Spatial Planning and Energy. The Ministry has to keep registers of the companies that obtained permits or confirmations. The lists of registered companies are published once a year in the *Uradni list RS*, the Official Gazette of the Republic of Slovenia (Articles 37, 38 RWM).

Record-keeping and reporting

Waste generators, collectors and recovery and disposal facilities have to keep records on the generated or managed wastes and have to submit annual reports to the Ministry. The following groups are excluded from the reporting obligations:

- waste generators that produce no more than 80 tonnes of waste or 20 kg of hazardous waste per year (Article 23 RWM);
- collectors of non-hazardous waste for recovery (Article 26 RWM); and
- recovery facilities that process no more than 20 tonnes of waste from other companies (Article 33 RWM).

Since 1 January 1999, these record-keeping and reporting obligations have to be fulfilled (Article 42 RWM). Obligatory reporting forms are defined in Annex 7 of the RWM.

The RWM obliges companies generating more than 150 tonnes of waste or 200 kg of hazardous waste to draw up waste management plans covering a period of four years (Article 19 RWM).

Shipments of waste for disposal and shipments of hazardous waste for recovery must be accompanied by a record sheet on waste management. The form of the record sheet is defined in Annex 6 to the RWM.

Waste classification

The European waste catalogue (EWC) and the hazardous waste list (HWL) were transposed into Slovenian law together with the RWM (Annexes 1 and 2). Their application has been obligatory since 1999. In 2001, the new European waste list (EWL) was introduced. The starting date for their application was 2002.

Institutional framework

The **Ministry of the Environment, Spatial Planning and Energy (MESP)** is the key competent authority for the waste management and responsible for waste legislation and planning on the national level. The Ministry of Health has a consultative and monitoring role with the shipment of waste directive. Pursuant to the RWM, the Ministry is responsible for issuing permits and confirmations. It has to keep registers on waste management operators and has to deal with the reports of the obligated parties. These tasks are carried out by the Environmental Agency on behalf of the Ministry.

To strengthen the administrative capacities in the field of environmental policy the former organisations of the Nature Protection Authority, the Hydro-meteorological Institute, and the Geophysical Institute were integrated into the **Environmental Agency of the Republic of Slovenia (EARS).** The Agency was established in April 2001 and is subordinated to the MESP. It has licensing and enforcement powers and functions as the competent authority under environmental directives. It is responsible for the compilation of data resulting from the waste-reporting requirements of the RWM and runs the waste management database. The Agency is the Slovenian national focal point to the European Environment Agency (EEA) and the competent authority and the focal point for the Basel Convention.

The **Statistical Office of the Republic of Slovenia (SORS)**, until 2001, carried out two statistical surveys on waste. The 'survey on public waste removal and public landfill sites' (KOOP) gathered data on collection and treatment of municipal waste. The 'survey on waste from economic activities' (ODP-1) collected data on the type and the amount of waste generated by enterprises along their business operations. Both surveys had a periodicity of three years and were first carried out for the year 1992. Since 2001, the Statistical Office together with the Environmental Agency has followed a new harmonised approach of data collection, consisting of five annual surveys, three for industrial waste and two for municipal waste.

Waste information collection

Up to 2001, data on industrial and hazardous waste generation and management were collected in two different ways, based on administrative data and on statistical surveys. Differences exist with regard to the coverage of the surveys and their frequency.

Administrative data

Collection of administrative data is based on the reporting obligations pursuant to the rules on waste management (RWM). According to the regulations, the reporting obligation covers all waste generators, collectors and treatment facilities with the exception of:

- waste generators and recovery facilities falling below the legal thresholds mentioned above; and
- collectors of non-hazardous waste for recovery.

The obligated parties report annually to the Agency using the mandatory reporting forms according to Annex 7 RWM. Reports must be sent by 31 March of the following year. Data from the reports are entered into the waste management database and checks for completeness and data quality are carried out. The data are presented in the Slovene reports on the state of the environment.

Statistical data

Since 1992, the Statistical Office has collected data on industrial and hazardous waste. The surveys are carried out every three years. So, statistical data are available for the years 1992, 1995, 1998 and 2001. The survey for 1998 was based on the European waste catalogue and the hazardous waste list. For the 2001 survey the European waste list was applied for the first time. The statistical survey covers all enterprises belonging to the NACE Sections C–I, K and M–O [(1)]. The data are presented in the publications of the Statistical Office and are reported to Eurostat and the OECD.

One of the problems of the statistical survey on industrial waste generation is the insufficient response rate. In 1998 quantities of generated waste were reported by 1 797 out of 3 017 enterprises covered by the survey which corresponds to a response rate of 60 % [3].

Development of a harmonised data collection

To improve data quality, the Statistical Office and the Environmental Agency have agreed to seek a closer cooperation and to unify the surveys in the field of waste management. Thus, a uniform and consistent set of data shall be achieved and the burden for the reporting units will be reduced.

In this context, the Statistical Office changes the frequency of its surveys to a yearly data collection. Together with the Agency, joint questionnaires are being developed. The existing questionnaire on non-municipal waste (ODP-1) will be replaced by three separate questionnaires for waste generators, waste collectors and waste treatment facilities. The questionnaire for waste generators will address the question of internal treatment in a separate table.

Pilot project 'survey on industrial and hazardous waste in Slovenia'

The Statistical Office carried out the pilot project 'survey on industrial and hazardous waste in Slovenia' in the period from August 2002 to July 2003 to support the introduction of the new surveys. The project aimed to improve the methodology and data quality, taking into consideration the requirements of the European waste statistics regulation (2002/2150/EC).

The main tasks of the project were:

- to develop a new questionnaire in consultation with the Environmental Agency;
- to update the register of reporting entities;
- to develop a software for data handling;
- to carry out a pilot survey and to analyse and evaluate the collected data.

The reference year of the pilot survey is the year 2002. The survey is focused on enterprises carrying out internal waste treatment. The developed questionnaires will be in line with the requirements of the waste statistic regulation and the OECD/ Eurostat joint questionnaire. Classification of waste will be based on the European waste list.

For the pilot survey a new directory of reporting units was prepared. It covers the enterprises classified into NACE Sections C to O under consideration of the size of the enterprises as shown in Table 2.34.

Table 2.34
Coverage of the directory on reporting units of the Statistical Office

Obligated enterprises	Coverage
Enterprises licensed for waste recovery or waste disposal	all enterprises
Enterprises of NACE Division 90.0 [(a)]	all enterprises
Enterprises of NACE Sections C, D and E [(b)]	> 5 employees
Enterprises of NACE Sections F to O [(c)]	> 10 employees

(a) NACE 90: Sewage and refuse disposal, sanitation and similar activities.
(b) C: Mining and quarrying; D: Manufacturing; E: Electricity, gas and water supply.
(c) For description of NACE Sections F to O please refer to the annex.

In total, some 706 companies were addressed in the pilot survey. The results of the survey will be included in the 2004 joint questionnaire.

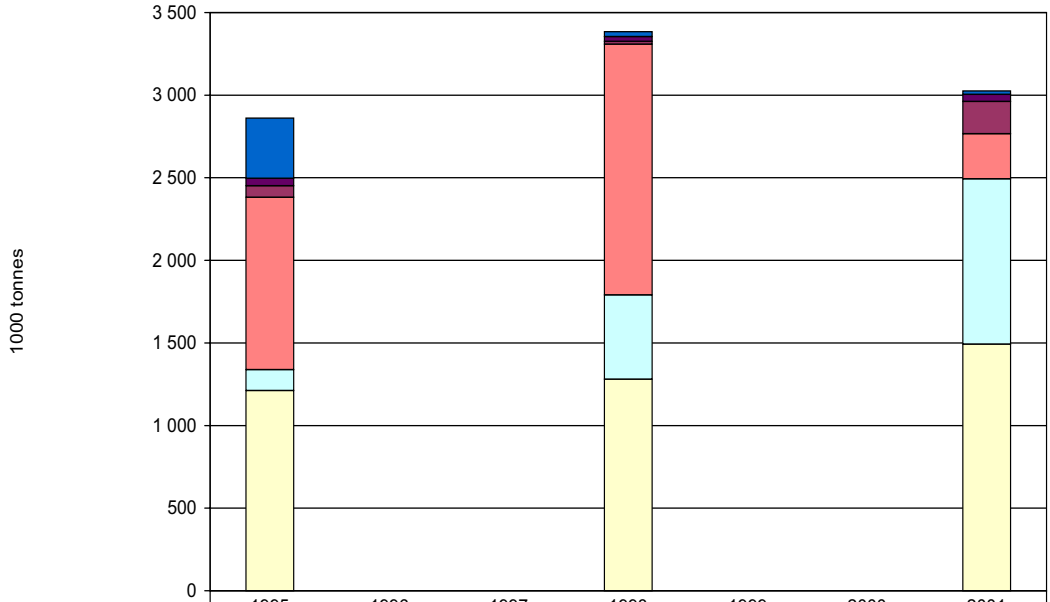
Data on waste management

In the following sections, the data on the generation and management of hazardous waste and non-hazardous industrial waste as reported to Eurostat in the joint questionnaire are presented. The joint questionnaire is filled in by the Statistical Office. Data were reported to Eurostat for the years 1995, 1998 and 2001. Additional information was retrieved from the *State of the environment report 2002*, which is based mainly on data from the waste management database of the Environmental Agency [4].

(1))For an explanation of NACE codes please refer to the annex.

Figure 2.28

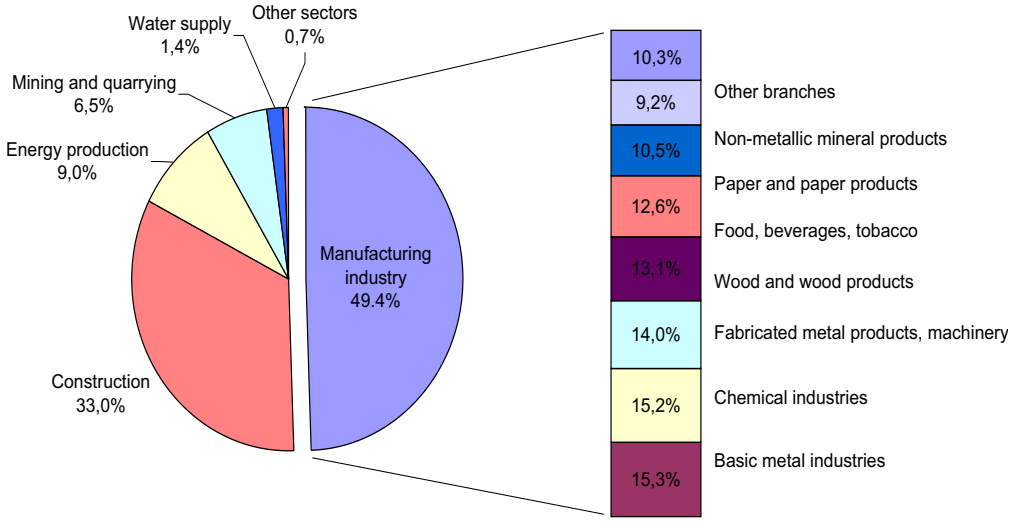
Development of industrial waste generation (including hazardous waste) in Slovenia



	1995	1998	2001
Other sectors	365	30	21
Water supply	44	28	42
Mining and quarrying	70	17	196
Energy production	1 044	1 518	273
Construction	126	510	1 000
Manufacturing industry	1 212	1 281	1 493

Figure 2.29

Breakdown of industrial waste generation (including hazardous waste) in Slovenia by sectors in 2001

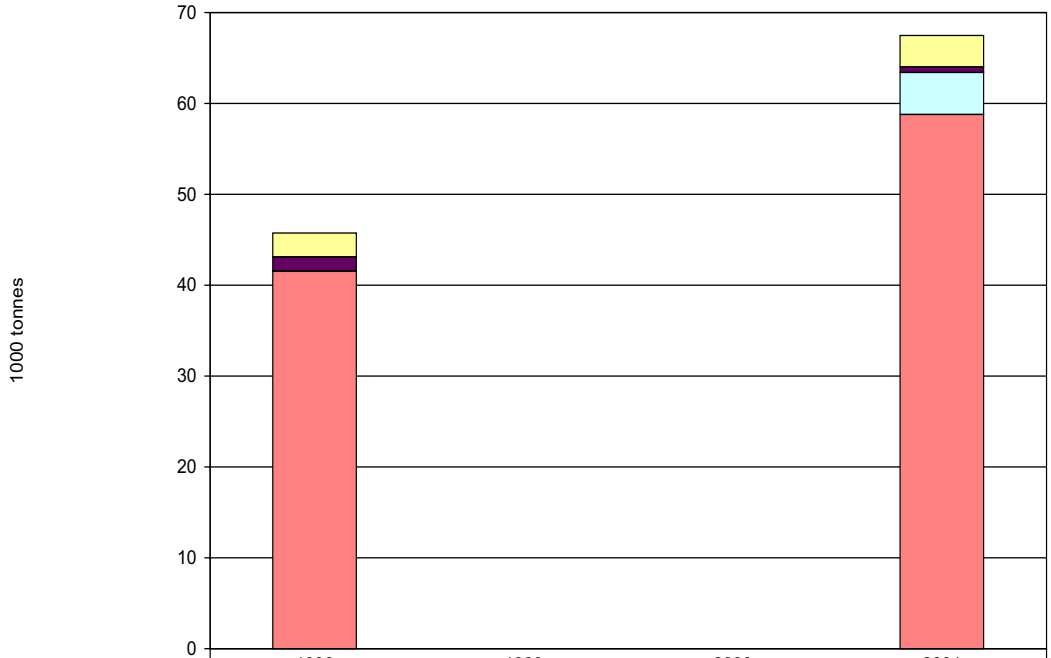


Total: 3,026 million tonnes

Sub-total: 1,493 million tonnes

Figure 2.30

Development of hazardous waste generation in Slovenia



	1998	1999	2000	2001
Other sectors	2,6			3,5
Construction	1,5			0,6
Mining and quarrying	0,1			4,6
Manufacturing industry	41,5			58,8

Waste generation

Industrial waste

For 2001, Slovenia reports a total amount of 3.98 million tonnes of generated waste. Industrial waste accounts for 3.03 million tonnes or 76 % of this amount. The remaining 0.95 million tonnes are municipal waste. Waste from agriculture and forestry is not included in these figures as these sectors are not covered by the statistical survey.

Figure 2.28 shows the development of the industrial waste generation, including hazardous waste, in Slovenia. From 1998 to 2001 the figures indicate a decline of the generated total which is mainly caused by the sharp decrease of waste from energy production. Waste amounts from construction and from the manufacturing industry show an opposite trend. These waste types have increased continuously since 1995. However, in view of the three-yearly frequency and the changes in waste classification between 1995, 1998 and 2001 reliable conclusions on the trend of the industrial waste generation are hardly possible on the bases of the available data.

Figure 2.29 shows the breakdown of the industrial waste total in 2001 according to origin. Generation of industrial waste is dominated by the manufacturing industry, which accounts for half of all industrial waste (49.4 %). Another 33 % is generated by the construction industry. Main waste generators within the manufacturing industries are the metal and engineering industry, the chemical and wood processing industry and the food sector.

Hazardous waste

In the joint questionnaire, Slovenia reports that 67 490 tonnes of hazardous waste were generated in 2001. This amount corresponds to about 34 kg of hazardous waste per inhabitant and year and is quite similar to the hazardous waste generation reported by other candidate countries like Latvia (35 kg) and Romania (40 kg).

A higher amount of generated hazardous waste is reported by the Environmental Agency. Based on the waste management reports of obligated enterprises the Agency calculates a hazardous waste generation of 78 885 tonnes for 2001. A comparison of statistical and administrative data is shown in Table 2.35.

According to data reported to Eurostat, the predominant part of hazardous waste (about 87 %) is generated by the manufacturing industry. The predominant waste types are inorganic and organic waste from chemical processes, oil waste and waste from thermal processes. Another 7 % of hazardous waste results from mining and quarrying activities. Hazardous waste from other economic sectors and from municipalities accounts for only 6 % of the hazardous waste total.

Figure 2.30 show the hazardous waste generation in 1998 and 2001. Looking at the development of hazardous waste generation, the figures indicate an increase of about 21 000 tonnes from 1998 to 2001. The same trend is shown by the annual figures of the Environmental Agency, which are available for 1999 and later (see Table 2.35). The *State of the environment report 2002* states that this increase might be partially due to changed methodology of reporting and to an increase in the number of those who are liable to report [4].

Table 2.35
Hazardous waste generation according to the Statistical Office and the Environmental Agency

Reference year	Hazardous waste generation in tonnes according to ...	
	Statistical Office	Environmental Agency
1998	46 265	-
1999	-	31 970
2000	-	35 382
2001	67 521	78 885

Source: *[4]*

Waste treatment

Data on waste recovery, treatment and disposal in Slovenia are poor. The joint questionnaire contains no information at all on waste treatment and disposal, neither for non-hazardous industrial waste nor for hazardous waste. Additional information was taken mainly from the Slovene *State of the environment report 2002 [4]*.

Landfilling

Waste management methods are still dominated by landfilling. Currently, Slovenia has 51 active landfills for municipal waste and similar non-hazardous waste (see Table 2.36). Pursuant to the Rules on Landfill of Waste (OG RS 5/00) the operation of 21 landfills is due to cease by 2004, and a further 13 landfills will cease operation by 2009. After 2008 a total of 17 landfills will still be operating. By then, the landfills are obliged to have adjusted to the prescribed technical demands [4].

Industry frequently disposes of its waste together with municipal waste. Some companies, though, have their own mono-disposal sites for specific types of hazardous waste, e.g. sites for disposal of tailings, slag and cinders [5]. In Slovenia 10 industrial landfills are currently in operation. In addition, there is only one hazardous waste landfill in Slovenia. This landfill is situated in Metava and takes around 500 tonnes of waste each year, mainly from the greater Maribor area [4].

In addition to the active waste dumps there are also a range of abandoned sites created by inappropriate landfilling of industrial waste. These are the tar dump at Maribor, the industrial waste dump of Globovnik near Ilirska Bistrica, and the iron hydroxide and ash dump at Kidricevo. These old burdens require special technical solutions and major investment, and their rehabilitation is envisaged in the strategic guidelines for waste management [4].

Incineration

At present eight incinerators are in operation in Slovenia that have obtained licenses for the incineration of waste (see Table 2.36). Two of the facilities are licensed as waste incinerators for thermal treatment of hazardous waste (LEK d.d., Ljubljana and PINUS TKI d.d., Race). The other five facilitates are using waste as fuel (Energetika Ravne d.o.o., Ravne na Koroškem, Salonit Anhovo d.d., Anhovo, OPTE Ptuj d.o.o., Ptuj, Glin Pohištvo d.o.o., Nazarje and ETRA 33 d.d., Ljubljana) [4].

The construction of waste incineration plants for municipal and similar wastes has been discussed for years, but is still hampered by strong opposition among the population. There are plans to build two or three municipal incineration plants. Planning is most advanced for the construction of a plant in Kidricevo, on the premises of an industrial facility. The plant shall treat the waste of five Slovene regions encompassing 850 000 inhabitants and about 440 000 tonnes of waste [6].

Recycling

The collection of secondary raw materials for recycling has a relatively long tradition and has been quite successful. However, with the loss of the former Yugoslav markets the trade of secondary raw materials decreased. Among the collected raw materials iron, steel, non-ferrous metals, glass, paper, textiles and plastic prevail. The bulk of these materials is generated and collected in industry, the municipal share being fairly small [5].

Table 2.36
Waste treatment and disposal installations for hazardous and non-hazardous waste in 2001

	Installations for ...		
	non-hazardous waste	hazardous waste	hazardous and non-hazardous waste
Treatment plants			
Number (n)			29
Capacity (1 000 tonnes)			
Incineration plants			
Number (n)			7
Capacity (1 000 tonnes)			
Landfill sites			
Number (n)			51
Remaining capacity (1 000 tonnes)			
Permanent storage			
Number (n)			
Capacity (1 000 tonnes)			
Other			
Number (n)			4
Capacity (1 000 tonnes)			

Imports and exports of waste

In Slovenia, the export of hazardous waste is only permitted if the technical capacities and necessary facilities for the disposal of such waste do not exist within the country. Imports are permitted only for recovery but not for disposal.

For some industrial branches, the export of specific types of hazardous waste is the only option. In 2001, 7 887 tonnes of hazardous waste were exported. This is an increase of 3 000 tonnes compared to the year 2000. Exports have been predominantly of paint and varnish sludge, followed by halogenated and non-halogenated organic solvents, waste paints and varnishes. A small share has been taken by sludge from the mechanical surface treatment of metals, used batteries, ash and residue from thermal metallurgy, waste edible oil and transformers and condensers containing PCB [4].

The quantities of hazardous waste imported in recent years remained fairly constant. In 2001, imports amounted to 20 495 tonnes. The largest quantity has been waste lead batteries for processing at Rudnik Me_ica MPI which came from Croatia and Hungary, as well as Romania and Bosnia-Herzegovina. In recent years a certain amount of acids and base solutions have also been imported for processing at the Celje zinc works [4].

Institutions and contacts

Institution	Contact
Ministry of the Environment, Spatial Planning and Energy	http://www.sigov.si/mop
Environmental Agency of Slovenia	http://www.rzs-hm.si
Statistical Office of the Republic of Slovenia	http://www.stat.si

List of relevant regulations

- Environment Protection Act (OG RS 32/93, 1/96)
- Rules on waste management (OG RS 84/98, 45/00, 20/01)
- Rules on landfill of waste (OG RS 5/00)

References

[1] State of the environment report 1996

[2] 2002 Regular report on Slovenia's progress towards accession, European Commission

[3] Statistical yearbook of the Republic of Slovenia 2002, Statistical Office of the Republic of Slovenia, 2002

[4] State of the environment report, Government of the Republic of Slovenia, Ljubljana, 2002

[5] National environmental action programme' (NEAP), Ministry of the Environment, and Spatial Planning, Administration for the protection of nature, Ljubljana, 1999

[6] Euwid, No. 40, 4.10.2000

Comparison of Waste Generation

Preliminary remarks

The country comparison is restricted to a comparison of waste generation. The available joint questionnaire data from waste treatment do not allow any comparison because for each country there are only a few installations whose capacities and managed quantities are tabled.

The comparison of country data on industrial waste generation and on hazardous waste generation is difficult because the 'natural' country variation based on differences in input materials, production methods and internal recovery procedures applied is covered or suppressed by data collection insufficiencies or shortcomings.

This is of course not only the case for the candidate countries which are included in this study but also for EU Member States. But the situation for the candidate countries is indeed more difficult because they are all still facing a huge industrial transition process and, in addition, are requested to build up institutional capacity for waste control and reporting in line with EU requirements.

There are, above all, two main problems with data collection which reduce comparability between countries:

- insufficient registering of companies obliged to deliver waste management reports; and
- non-harmonised differentiation between waste and non-waste especially for the sectors 'mining and quarrying', 'energy production' and 'construction and demolition'[(1)].

The first problem is still a huge problem in most of the candidate countries where the licensing and permitting of relevant companies is still in the process of development. The mature phase where licensing and permitting is concentrated on updating has not yet been reached. And it seems probable that some countries will need a lot of time to reach this phase if they do not intensify considerably their efforts and capacities.

The second problem is not only a problem for candidate countries but also for EU Member States and refers to the availability of harmonised, meaningful and operational criteria for the various wastes (types) to be included in control and reporting. For the three above-mentioned industrial sectors in particular, there exists in all countries a considerable direct utilisation (recycling and/or recovery) above all in agriculture (soil improvement and fertiliser application), landscape formation (noise protection walls), construction of motorways and forestry paths and of course in the sectors themselves (mining waste is taken for the stabilisation of holes and construction and demolition waste is recycled even in situ for motorways). Up to now there is no common understanding on how far these different wastes should be registered[(2)]. In the process of implementation of the waste statistics regulation practical criteria should also be found or taken on board.

Comparison of waste generation by broad sectors

Table 3.1 presents the total for industrial waste for the most actual year (2000 or 2001) for the 10 candidate countries[(3)]. The data do not include hazardous waste — only non-hazardous industrial waste — with one exception: Lithuania. The totals are split up by six branches and a residual category. Some countries (Estonia and Lithuania) could not give any breakdown of the totals[(4)].

It is clearly visible that the total quantities depend to a large degree on mining activity. If these mining activities are considerable (as in Bulgaria, Poland and Romania) then the total amounts are raised by millions of tonnes. In order to enable a better comparison, the data are standardised in two different ways:

- division of the waste amounts generated by number of inhabitants resulting in quantities in kg per inhabitant and year; and
- division of the waste amounts generated by the respective branch turnover resulting in kg per 1000 Euro NACE-GDP (gross domestic product for NACE groups or branches)[(5)].

The standardisation by division through number of inhabitants is usual and directly meaningful for municipal waste, because inhabitants can be seen as source for municipal waste. For industrial (and hazardous) waste this standardisation has not such a direct and clear meaning. For sectors which might be export-oriented (like mining and manufacturing) or where the amounts can be 'naturally' enormously different (mining) the standardised figures only show that these activities are not comparable and no evaluation on the waste amounts can be given. The situation for sectors which are supplying the population (and industry) like water supply and energy production is slightly different. Such sectors should be comparable to a certain degree, i.e. the standardised figures[(6)] should be nearly equal.

The standardisation by turnover of the branch seems to be more meaningful for industrial waste because it relates waste generation to output (in monetary terms). Differences in figures standardised by respective turnover should result from differences in technology utilised and from differences in the prices realised[(7)]. But this standardisation is of course more meaningful if the branch or the NACE code is quite narrow. If the branches

(1) These sectors are producing huge quantities of several waste types which are nearly 'traditionally' recovered or recycled either in the sector itself (internal recovery above all in mining and quarrying and in the construction and demolition sectors) or in other sectors like agriculture.
(2) In Germany there is an agreement between the association of the construction sector and the Environment Ministry to reach a share of 80% of recovered construction waste. This agreement leads of course to the inclusion of all recovered waste into the balance and to a very wide definition of waste. Otherwise the threshold can never be reached. Accordingly the annual quantity of construction waste is nearly 200 million tonnes.
(3) More actual data can be found in some of the pilot projects which were carried out in the framework of this multi-country Phare project. The results could not be integrated into this publication because of the overlapping time period.
(4) This has changed now with the pilot studies mentioned in the footnote above. Both countries are now able to split up and provide quite recent and comprehensive data of good quality.
(5) This division could only be done for those branches and those countries where turnover figures exist. This is not the case for Bulgaria.
(6) Standardisation by number of inhabitants.
(7) Under the assumption that exactly the waste resulting from such an activity is comprehensively registered and that no other wastes are included.

are so all-encompassing (as is the case here!) the comparison leads to vague results.

Analysis of the results

The comparison of the totals does not seem to be very useful. Even the differences between the standardised figures are extremely wide (from 230 kg/capita for Latvia to 11003 kg/capita for Bulgaria) that it can only be concluded that for some countries the sectors which are producing the enormous quantities (mining) are included and for others not. It might also be the case that the registering of excavation waste is handled differently in the various countries(1).

It seems more useful to compare figures for selected branches! First of all, it is clearly visible by the comparison of the standardised figures that the country data on construction and demolition are hardly comparable — differences of up to more than factor 700 for inhabitant standardisation and up to factor 300 for turnover standardisation (Figures 3.5 and 3.6). Such results can only appear when the types of wastes which are included — the coverage — are different from country to country.

The standardised water supply figures are not so different — compared to other sectors — except for Latvia with less than 0.5 kg/capita. These figures should be first to be investigated in the future because the already existing situation — contrasting with extreme differences in other sectors — gives a basis for harmonised development of methodology.

The standardised data (standardisation by turnover) for the combined sectors, 'energy production' and 'water supply' (Figures 3.3 and 3.4) are also quite interesting. Here four of the seven countries for which data can be calculated are situated in a corridor +/– 4.400 kg/NACE GDP. It would also be interesting to investigate this further and to compare with EU Member States figures.

Comparison of waste generation in the manufacturing sector

Table 3.2 contains data for the candidate countries on waste generation in the manufacturing sector. This sector is divided according to the joint questionnaire into 11 sub-sectors and one residual(2). Two countries are not able to split up the data(3). The data are given in absolute figures and standardised by inhabitants. The standardisation by turnover of the sub-sectors was not possible due to the unavailability of monetary figures on the side of Eurostat.

The first remarkable result is that the total amount of waste generated in the manufacturing sector of Poland (58 million tonnes) is much higher than the total amount of the sum of all wastes generated in all the other countries. Even the biggest sub-sector in Poland ('basic metal industries' with 37 million tonnes) is generating more waste than all the other countries put together. However it must be clarified whether this result completely reflects the reality or if it is partially a statistical artefact resulting from the well-developed waste statistics in Poland compared to other candidate countries. An initial clarification can be reached by the analysis of the standardised data. If the waste statistics in Poland would be much more comprehensive than in all the other countries then the quantities generated per capita for each sub-sector would be much higher than in all other countries. This is not the case! In only 3 of the 11 sub-sectors ('food, beverages, tobacco', 'chemical industries' and 'basic metal industries') are the quantities higher for Poland compared to other countries. And in only one sector ('basic metal industries') are the quantities much higher (factor 3 to 20). It can therefore be concluded that the figures cannot be assessed as unrealistic but they need further investigation. Another important point is the exclusion of hazardous wastes in the reporting from Hungary and Poland. This leads of course to a severe underestimation of wastes from 'oil refineries' and 'chemical industries' for these countries and to reduced comparability with other countries because these sectors also produce considerable amounts of hazardous wastes.

Figure 3.7 shows the structure of waste production in manufacturing industry in the 10 countries. It can easily be seen which highlysectors are of high or low importancesectors in the various countries. For example, Latvia is dominated by 'food, beverages and tobacco' and 'wood and wood products' and Bulgaria by 'chemical industries' and 'basic metal industries'. But there are also some countries — especially Slovenia — which seem to be 'balanced'.

This comparison will be improved in the future by the specification ofthe waste types.

Comparison of hazardous waste generation

The hazardous waste quantities presented in Table 3.3 are based on national definitions of the countries with one exception: Hungary is reporting in the data source JQ according to the Basel definition(4). The hazardous wastes are reported for eight sectors and one residual. Only five countries are specifying their totals, which are given by all 10 countries.

Four of the five countries, which are specifying their hazardous waste generation, have mainly (about 90%) hazardous wastes generated by the sub-sector 'manufacturing industry'. Only the Czech Republic also registers considerable amounts of hazardous wastes also in other sectors like 'energy production' and 'construction and demolition'. This leads to several questions:

- Do the other countriesdon't not have any hazardous wastes in these sectors because they do not recognise these wastes and can this fact?really be the case?
- Aren't theynot producing any flue ash in the energy sector or asbestos wastes in demolition sector which are certainly hazardous?

The huge quantity of hazardous waste for Estonia is a result of the utilisation of oil shaleoil-shale for electricity production. The ash, which occurs in very high quantities, is classified as hazardous.

(1) It is known that for Romania the excavation quantities from mining and quarrying are excluded.
(2) The figures do include hazardous wastes. Except Hungary and Poland.
(3) These two countries (Estonia and Lithuania) are now able to deliver comprehensive and more actual data which could not be included but which will be available on the websites of Eurostat and LANDSIS/ARGUS.
(4) The Czech Republic states that their hazardous waste generation is higher than in other countries because their list of hazardous waste is more comprehensive than the European hazardous waste list. The same is most likely true for the Slovak Republic.

It is obvious that the comparison for hazardous wastes also cannot be done in an adequate way on the small database provided by the JQ. The classification must be much more detailed and harmonised and the countries must be able to provide data accordingly. The obligatory reporting according to waste statistics regulation will be a very important step in this direction.

Table 3.1

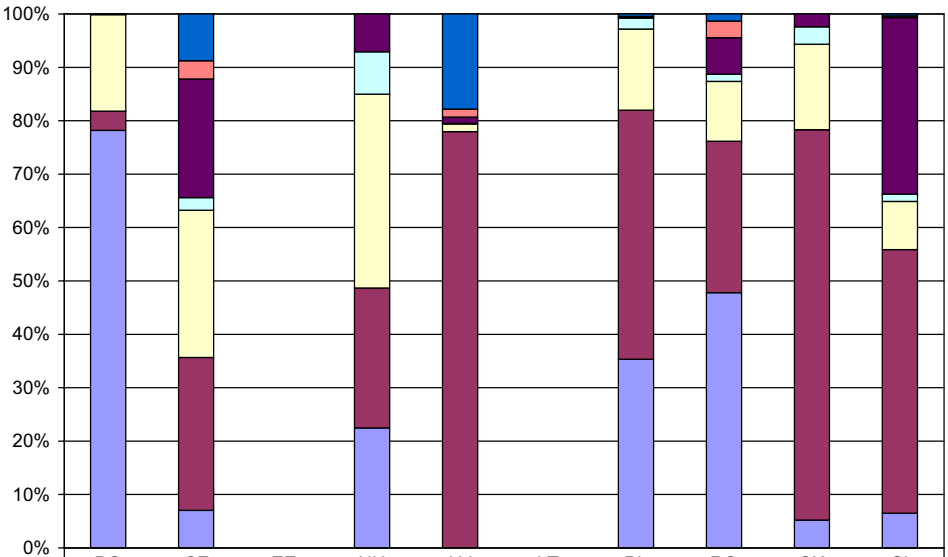
Generation of industrial waste by economic sectors

Reference year	BG[a] 2001	CZ[a] 2001	EE[a] 2000	HU 2000	LV[a] 2001	LT[b] 2001	PL 2001	RO[a] 2000	SK[a] 2000	SI[a] 2001
in 1000 tonnes										
Industrial waste total	87091	34078	10983 (c)	9946	542	4002 (d)	123810	44408	9226	3026
Mining and quarrying	68074	2386		2233 (e)			43731	21214 (f)	478	196
Manufacturing industry	3145	9758		2605 (c)	422		57746	12596	6744	1493
Energy production	15754	9398		3612	8		18823	4977	1478	273
Water supply	80	810		790	<0.5		2547	606	302	42
Construction	7	7565		707 (c)	7		134	3033	223	1000
Sewage and refuse disposal	3	1167			8		217	1381		9
Other sectors	28	2994 (g)			97		612 (h)	603		12
in kg/cap,a										
Industrial waste total	11003	3333	8017 (a)	974	230	1150 (b)	3204	1979	1711	1519
Mining and quarrying	8601	233		219 (c)			1132	946 (f)	89	98
Manufacturing industry	397	954		255 (c)	179		1494	561	1251	750
Energy production	1990	919		354	3		487	222	274	137
Water supply	10	79		77	<0.5		66	27	56	21
Construction	1	740		69 (c)	3		3	135	41	502
Sewage and refuse disposal	<0.5	114			3		6	62		5
Other sectors	4	293 (e)			41		16 (f)	27		6
in kg/1000 Euro GDP										
Mining and quarrying	(i)	3536		25590 (c)			14129	40417 (f)	2912	1176
Manufacturing industry	(i)	847		247 (c)	454		1897	1635	1731	318
Energy production and water supply	(i)	5306		4652	52		5463	9741	3479	746
Construction	(i)	4823		431 (c)	27		16	2102	358	1079

(a) Amounts include hazardous waste.
(b) Amounts exclude hazardous waste.
(c) JQ contains only data on 'total waste' and on 'municipal waste'. Industrial waste is calculated as difference between 'total waste generated' and 'municipal waste' (industrial waste = total waste - municipal waste).
(d) Data are not specified according to economic sectors but reported as waste from 'other sectors'.
(e) Data from companies with more than 10 employees.
(f) Data cover the ISIC-codes 90, 93 and others.
(g) Data cover the NACE sections 51, 55, 60, 64, 74, 85, 93.
(h) Excavation waste (Section 01 01 of the European Waste Catalogue) is not included.
(i) No data on GDP per sector available.

Figure 3.1

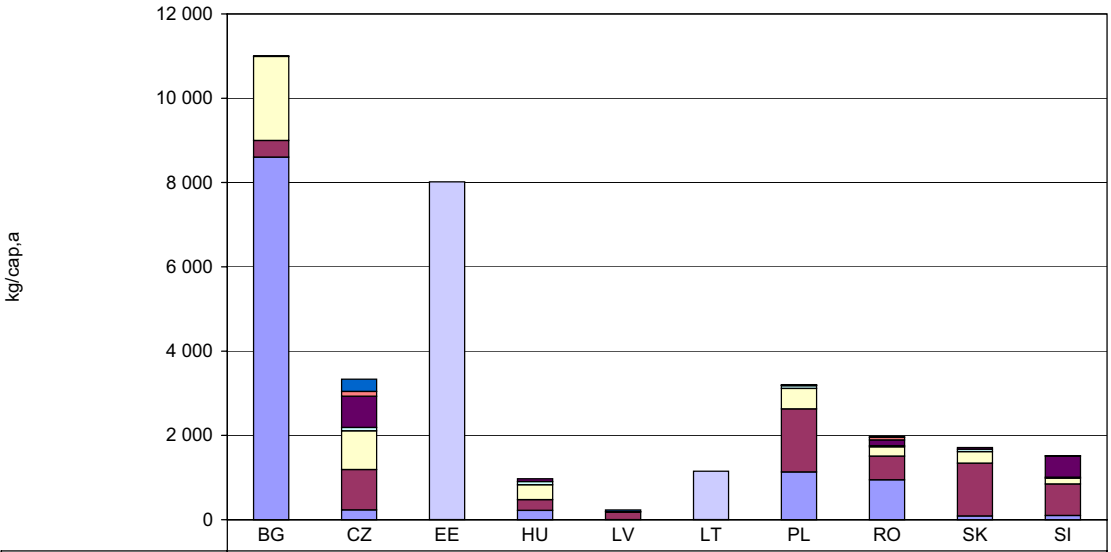
Breakdown of industrial waste by economic sectors



	BG	CZ	EE	HU	LV	LT	PL	RO	SK	SI
Other sectors	0,0%	8,8%			17,8%		0,5%	1,4%		0,4%
Sewage/refuse disposal	0,0%	3,4%			1,5%		0,2%	3,1%		0,3%
Construction	0,0%	22,2%		7,1%	1,2%		0,1%	6,8%	2,4%	33,0%
Water Supply	0,1%	2,4%		7,9%	0,1%		2,1%	1,4%	3,3%	1,4%
Energy Production	18,1%	27,6%		36,3%	1,4%		15,2%	11,2%	16,0%	9,0%
Manufacturing industry	3,6%	28,6%		26,2%	78,0%		46,6%	28,4%	73,1%	49,4%
Mining and quarrying	78,2%	7,0%		22,4%			35,3%	47,8%	5,2%	6,5%

Figure 3.2

Industrial waste generation per capita



	BG	CZ	EE	HU	LV	LT	PL	RO	SK	SI
Origin not specified			8 017	0		1 150			0	
Other sectors	4	293	0	0	41	0	16	27	0	6
Sewage/refuse disposal	0	114	0	0	3	0	6	62	0	5
Construction	1	740	0	69	3	0	3	135	41	502
Water Supply	10	79	0	77	0	0	66	27	56	21
Energy Production	1 990	919	0	354	3	0	487	222	274	137
Manufacturing industry	397	954	0	255	179	0	1 494	561	1 251	750
Mining and quarrying	8 601	233	0	219	0	0	1 132	946	89	98

Figure 3.3

Waste from energy production and water supply per capita

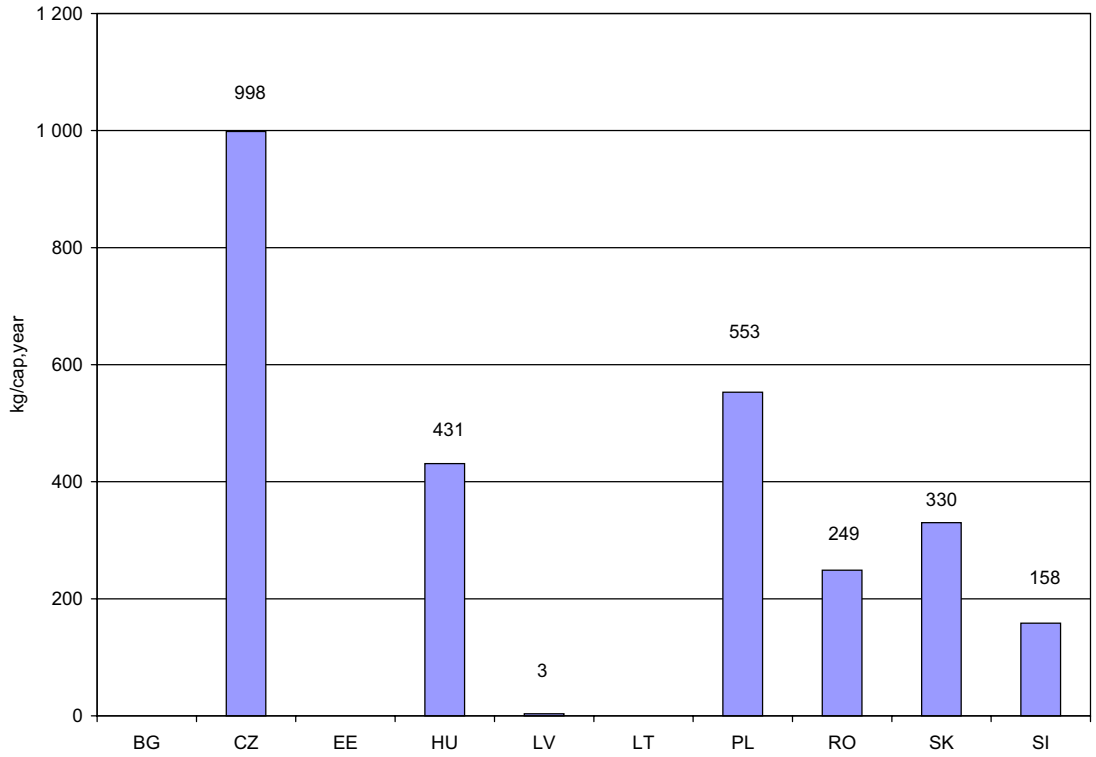


Figure 3.4

Waste from energy production and water supply in relation to economic growth (GDP)

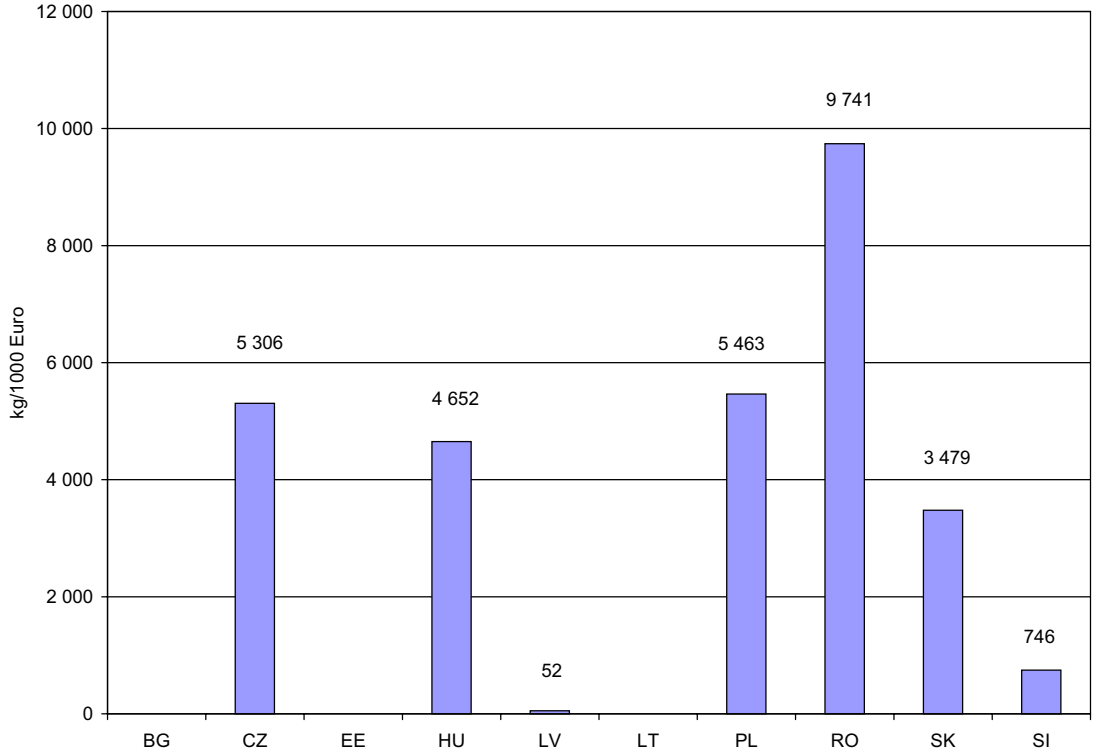


Table 3.2

Waste generation in the manufacturing industry by branches

Reference year	BG[(a)] 2001	CZ[(a)] 2001	EE	HU[(b)] 2000	LV[(a)] 2001	LT	PL 2001	RO[(a)] 2000	SK[(a)] 2000	SI[(a)] 2001
in 1000 tonnes										
Manufacturing industries total [(c)]	3145	9758		2605	422		57746	12596	4343	1495
Food, beverages, tobacco (15 – 16)	167	1525		567	218		9058	1254	1 577	188
Textile and leather industries (17 – 19)	48	134		26	41		182	1084	27	27
Wood and wood products (20)	57	294		254	69		1213	2716	430	196
Paper and paper products (21)	20	568		160	<0.5		1485	99	197	156
Printing and publishing (22)	2	50		30	1		18	17	10	8
Refineries etc. (23)	240	96		13			223	53	160	15
Chemical industries (24)	958	896		54	3		5034	684	358	227
Rubber and plastics (25)	3	29		34	<0.5		110	86	53	17
Non-metallic mineral products (26)	300	667		602	2		1709	1282	353	137
Basic metal industries (27)	1240	3805		538	58		37358	2480	230	228
Metal products, machinery (28 – 35)	102	1341		285	24		918	2463	944	209
Other branches (36 – 37)	8	253		43	7		438	379	4	86
in kg/cap,a										
Manufacturing industries total [(b)]	397	954		255	179		1494	561	806	750
Food, beverages, tobacco (15 – 16)	21	149		55	92		234	56	293	94
Textile and leather industries (17 – 19)	6	13		3	17		5	48	5	14
Wood and wood products (20)	7	29		25	29		31	121	80	99
Paper and paper products (21)	3	56		16	<0.5		38	4	37	78
Printing and publishing (22)	<0.5	5		3	<0.5		<0.5	1	2	4
Refineries etc. (23)	30	9		1			6	2	30	8
Chemical industries (24)	121	88		5	1		130	30	66	114
Rubber and plastics (25)	<0.5	13		3	<0.5		3	4	10	9
Non-metallic mineral products (26)	38	65		59	1		44	57	65	69
Basic metal industries (27)	157	372		53	25		967	111	43	114
Metal products, machinery (28 – 35)	13	131		28	10		24	110	175	105
Other branches (36 – 37)	1	25		4	3		11	17	1	43

(a) Amounts include hazardous waste.
(b) Data from companies with more than 10 employees.
(c) Figures in brackets give the code of the NACE division(s). A complete list of NACE divisions (NACE Rev.1) is contained in the Annex.

Figure 3.5

Waste from the construction sector per capita

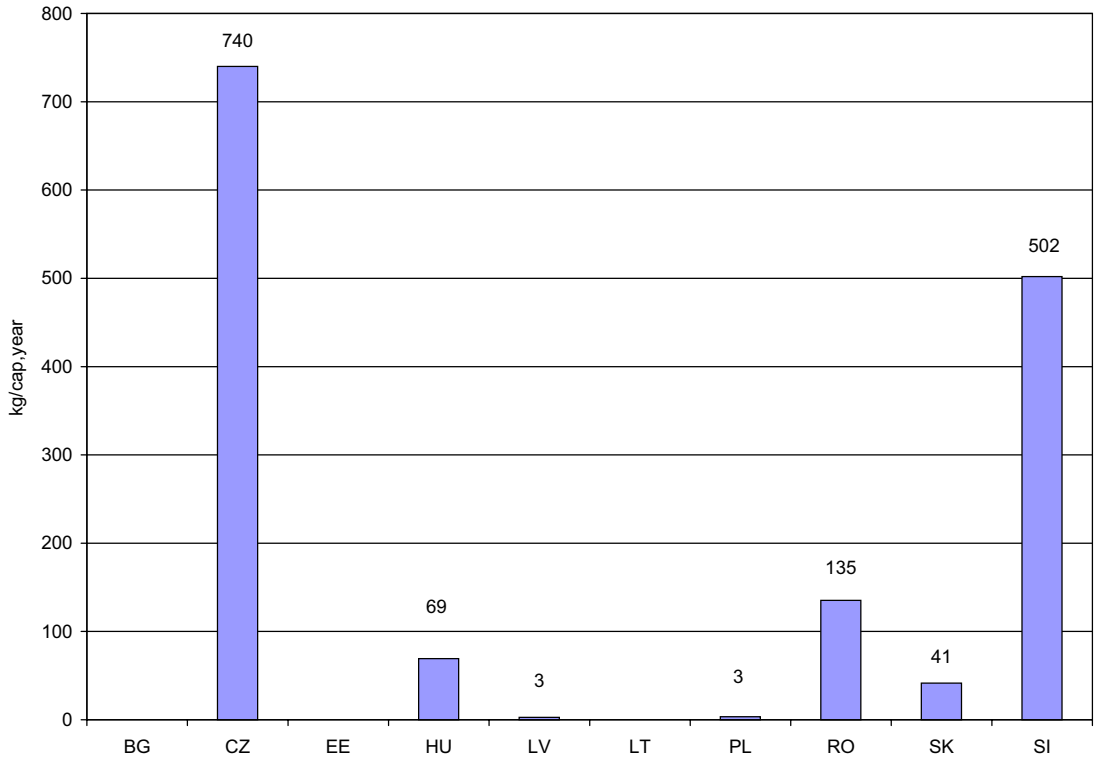


Figure 3.6

Waste from the construction sector in relation to economic

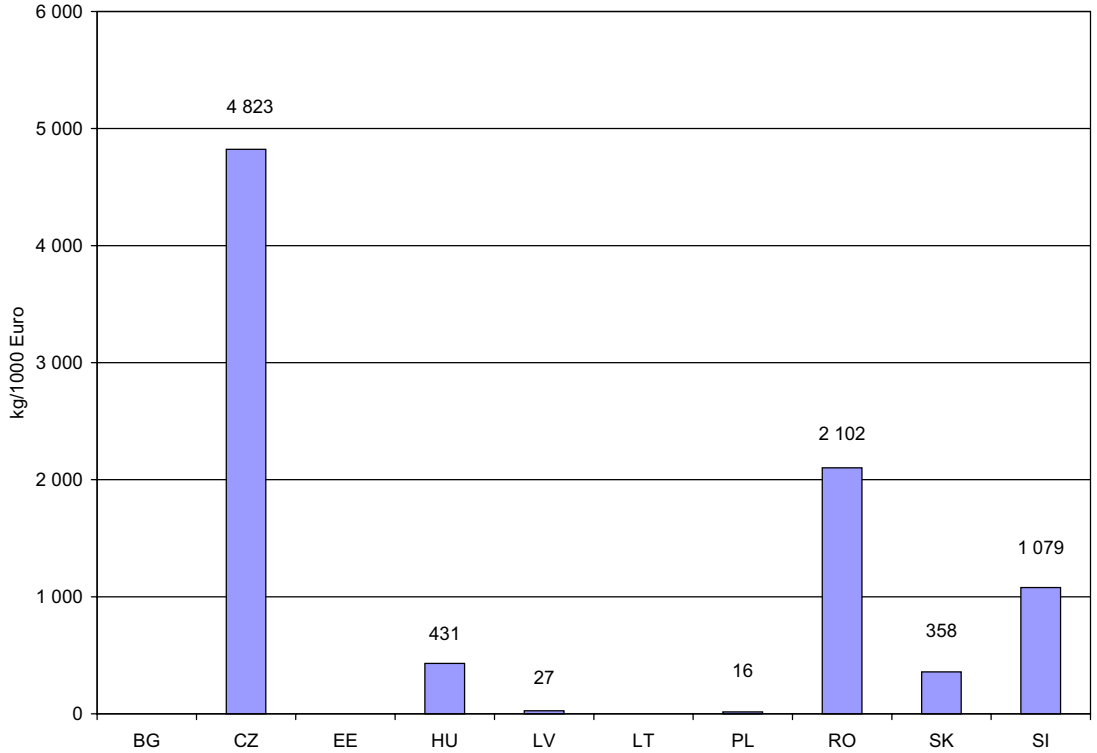


Table 3.3

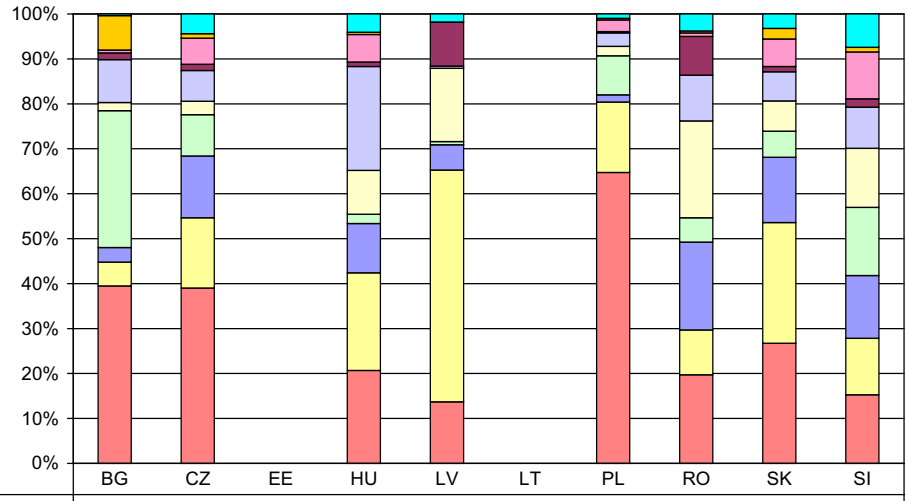
Generation of hazardous waste by economic sectors, based on national waste classification

Reference year	BG 2001	CZ 2001	EE 2000	HU 2000	LV 2001	LT 2001	PL 2001	RO 2000	SK 2000	SI 2001
in 1000 tonnes										
Hazardous waste total	756.0	2817.0	5966.0	951.0 (a)	82.0	111.0	1308.0	897.0	1630.0	68.0
Agriculture and forestry	<0.05	26.0			0.1			1.9		
Mining and quarrying	0.5 (b)	14.0						79.9		4.6
Manufacturing industry	733.6	1660.0			78.5			797.4		58.8
Energy production	1.6	522.0			0.2			1.2		0.5
Water supply	11.7	9.0						0.2		0.1
Construction	0.1	162.0			0.1					0.6
Sewage and refuse disposal	<0.05	265.0			<0.05					0.4
Municipal waste		32.0								
Other sectors	8.3	127.0 (c)			3.4			16.2		2.5
in kg/cap,a										
Hazardous waste total	95.0	276.0	4336.0	93.0 (a)	35.0	32.0	34.0	40.0	302.0	34.0
Agriculture and forestry		2.5			<0.05			0.1		
Mining and quarrying	0.1 (b)	1.4						3.6		2.3
Manufacturing industry	92.7	162.4			33.3			35.5		29.5
Energy production	0.2	51.1			0.1			0.1		0.3
Water supply	1.5	0.9						<0.05		<0.05
Construction	<0.05	15.8			<0.05					0.3
Sewage and refuse disposal	<0.05	25.9			<0.05					0.2
Municipal waste		3.1								
Other sectors	1.0	12.4 (c)			1.5			0.7		1.3
in kg/1000 Euro GDP										
Mining and quarrying	(d)	20.7						152.2		27.7
Manufacturing industry	(d)	144.1			84.5			103.5		12.5
Energy production and Water supply	(d)	276.0			1.4			2.4		1.4
Construction	(d)	103.3			0.4					0.7

(a) Data are based on Basel definition; according to the national waste classification the hazardous waste generation in Hungary amounts to 3.39 millions ton (332 kg/cap,a) in 2000.
(b) Considerable amounts of flotation waste (EWC 01.03.01) are not included.
(c) Data cover the NACE sections 51, 55, 60, 64, 74, 85, 93
(d) No data on GDP per sector available.

Figure 3.7

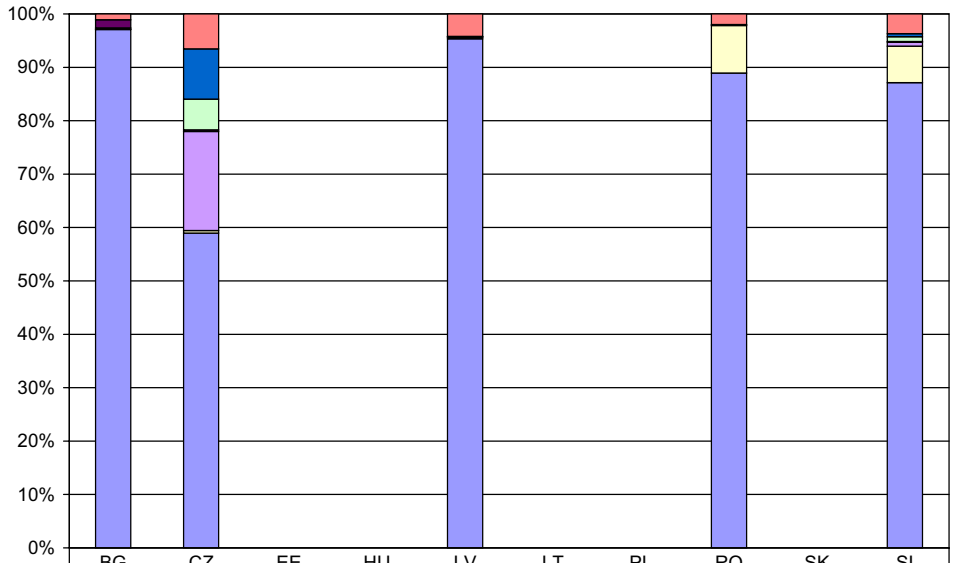
Breakdown of waste from the manufacturing industry by branches



	BG	CZ	EE	HU	LV	LT	PL	RO	SK	SI
Other branches	0,4%	4,4%		4,1%	1,8%		1,0%	3,8%	3,3%	7,4%
Refineries, etc.	7,6%	1,0%	0,0%	0,5%	0,0%	0,0%	0,4%	0,4%	2,3%	1,0%
Paper and paper products	0,6%	5,8%	0,0%	6,1%	0,0%	0,0%	2,6%	0,8%	6,1%	10,5%
Textile & leather industries	1,5%	1,4%	0,0%	1,0%	9,7%	0,0%	0,3%	8,6%	1,2%	1,8%
Non-metallic mineral products	9,5%	6,8%	0,0%	23,1%	0,5%	0,0%	3,0%	10,2%	6,5%	9,2%
Wood and wood products	1,8%	3,0%	0,0%	9,7%	16,3%	0,0%	2,1%	21,6%	6,7%	13,1%
Chemical industries	30,5%	9,2%	0,0%	2,1%	0,7%	0,0%	8,7%	5,4%	5,8%	15,2%
Fabricated metal products	3,2%	13,7%	0,0%	10,9%	5,6%	0,0%	1,6%	19,5%	14,5%	14,0%
Food, beverages, tobacco	5,3%	15,6%	0,0%	21,8%	51,5%	0,0%	15,7%	10,0%	26,9%	12,6%
Basic metal industries	39,4%	39,0%	0,0%	20,6%	13,7%	0,0%	64,7%	19,7%	26,7%	15,3%

Figure 3.8

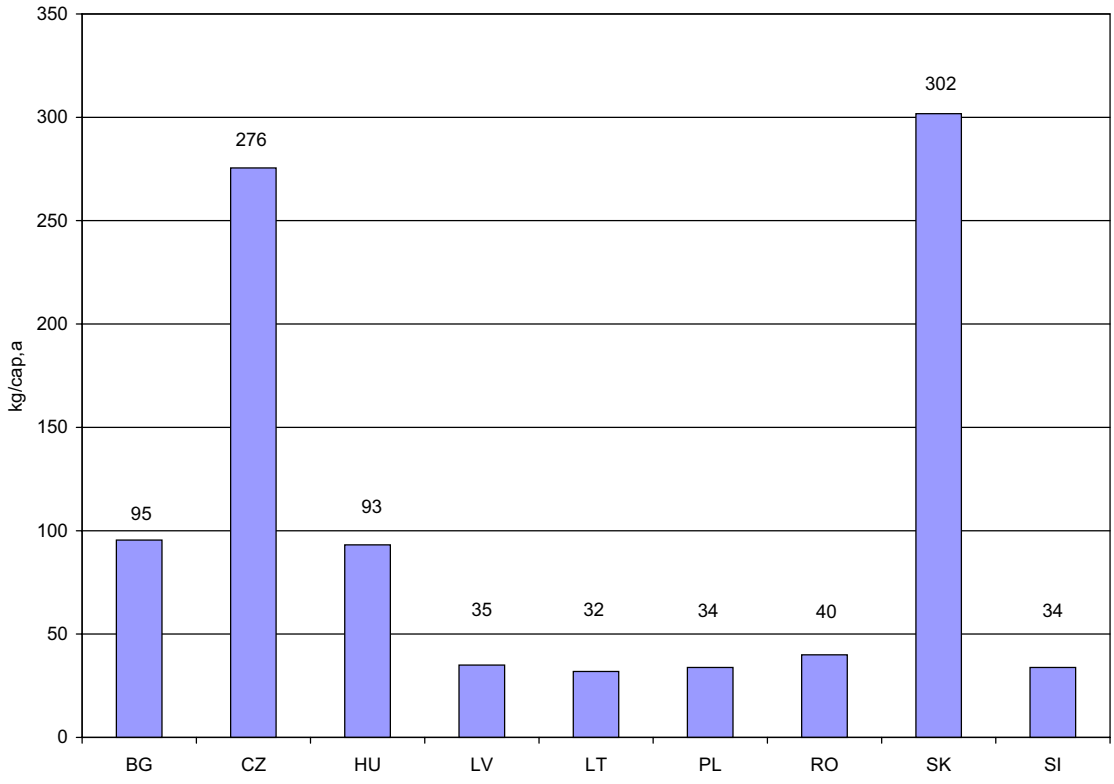
Breakdown of hazardous waste by economic sectors



	BG	CZ	EE	HU	LV	LT	PL	RO	SK	SI
Other sectors	1,1%	6,6%			4,2%			2,0%		3,7%
Sewage/refuse disposal	0,0%	9,4%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,6%
Construction	0,0%	5,8%	0,0%	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%	0,9%
Water supply	1,5%	0,3%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,1%
Energy Production	0,2%	18,5%	0,0%	0,0%	0,3%	0,0%	0,0%	0,1%	0,0%	0,7%
Mining and quarrying	0,1%	0,5%	0,0%	0,0%	0,0%	0,0%	0,0%	8,9%	0,0%	6,8%
Manufacturing industry	97,1%	58,9%	0,0%	0,0%	95,3%	0,0%	0,0%	88,9%	0,0%	87,1%

Figure 3.9

Generation of hazardous waste per capita



Summary

The present publication is one of the main results of a Phare multi-country project financed by Eurostat[1].

The aim of the Phare project with regard to waste was to improve the situation on waste information with particular reference to the capability of the candidate countries to fulfil the waste reporting obligations of the European Union for its Member States.

This means in effect the countries have to be supported in the development of an adequate and efficient waste control and reporting system.

On the enterprise side this includes the:

- successful application of the European list of wastes (LoW); and
- successful balancing of waste[2].

On the institutional side this includes:

- a complete registering of enterprises;
- competent handling of LoW;
- the development of sufficient legal basis; and
- the creation of reporting forms for enterprises.

It is obvious that in the framework of this small project only very restricted support could be given — compared to the enormous waste management problems that still exist.

Workshops and country-specific projects

The support had to be concentrated on training sessions (two workshops) and on country-specific projects.

The workshops focused on the general problems of building up coherent and efficient waste information systems adjusted for the EU and on alternative strategies based on selected Member States' experiences who had come along with their problems.

It was hoped that the country-specific projects to be financed within the framework of this Phare project would lead to substantial progress in the national waste information system. The experience from the previous Phare multicountry project on municipal waste[3] had already made clear that these countryspecific projects could not be very similar because candidate countries have taken quite different directions to build up their information system and have reached, in addition, different levels of maturity. A very important difference to the field of municipal waste also had to be considered. The topic reporting on hazardous waste is nearly exclusively handled in candidate countries by the Environment Ministry and its national and regional subordinated institutions. However the reporting on municipal waste is mostly handled by Statistical Offices. For hazardous waste therefore this reporting is carried out together with control of waste management. This can lead to a situation where waste management is not yet carried out completely in agreement with the obligations or not yet sufficiently controlled to prevent restricted or imprecise reporting. For hazardous waste, in particular, the public of course expects that the control is comprehensive and that management is as safe as possible. State institutions and enterprises definitely avoid giving the impression that hazardous waste management is not safe.

The other important reason why hazardous waste reporting might be insufficient is also a result of the combination of control and reporting. In a situation where enormous efforts have to be undertaken to build up control and to guarantee the functioning of waste management, the reporting is often seen as less important, as a secondary activity which will be carried out 'later'. This attitude is understandable but dangerous and undemocratic. It is dangerous because it can lead to a certain routine of neglecting the necessity of comprehensive and detailed reporting and it is not democratic because the deficits should be made public.

The table below gives an overview of the projects carried out in the framework of this Phare project[4]. The projects are quite different and always adapted to the country's specific needs. Despite significant differences, the reports on the various projects are valuable for all the countries because other countries can learn how to face situations or problems which can occur at certain stages of development.

Country[a]	Title of the project	Institution
Latvia	Improvement of data processing and reporting on non-hazardous industrial and hazardous waste	Joint Research Centre
Slovakia	Implementation of LoW in Hazardous waste reporting in Slovakia – Direction fulfilment of EU Reporting obligations (JQ and WSR)	Waste management department of Environment Ministry
Hungary	Development of a web-application that allows companies and local authorities to create and exchange XML structured files to be used in the Hungarian waste information system	Private company on behalf of Environment Ministry

(1) Phare multi-country project on land use and industrial and hazardous waste including 10 candidate countries.
(2) Successful balancing has as a precondition the integration of the legal principles of waste management (correct declaration, safe disposal, etc.) into enterprise policy.
(3) This project included the same countries plus Malta and Cyprus and also led to a Eurostat publication, *Municipal waste management in candidate countries*, published in mid-2002.
(4) The final project reports will be available in late autumn 2003 on the Eurostat website.

Country[a]	Title of the project	Institution
Slovenia	Industrial and hazardous waste in Slovenia	Statistical Office
Lithuania	Preparation and transposition of collected waste information into reporting forms requested by the EU	Environment Ministry on behalf of Statistical Office
Bulgaria	Improvement of the reporting system on hazardous waste through enhancement of the hazardous waste information system	Environment Ministry
Estonia	Statistical work on improvement of national waste information system (enterprises information) in Estonia	Statistical Office in co-operation with EEIC
Romania	Improvement of accuracy of data on hazardous waste generation and on waste treatment facilities (including first trial of application of European Waste List)	ICIM - Waste management department of Environment Ministry

(a) It was not possible to define and contract pilot projects for all involved countries. Poland and Czech Republic were due to special circumstances not capable to carry out projects.

Structure of the publication

This publication consists of one country chapter for each of the 10 countries and a comparison chapter where the available data are compared and analysed as far as possible.

The country chapters are harmonised by structure starting with three subchapters presenting the economic background and the legislative and institutional situation with regard to waste management. These basic subchapters are followed by a description of the instruments used to collect information on waste (waste reporting forms) and the pilot project carried out. Finally the available data are given.

Considerations

The Eurostat/OECD joint questionnaire (JQ) on waste is the most important information source for harmonised waste information in Europe. This questionnaire is not obligatory. Reporting for this questionnaire is seen as agreed by a gentlemen's agreement — the same is also true for the EU Member States. This led to the situation whereby the national reporting systems developed with almost no consideration of the information requests from JQ. This was because it was only agreed that the utmost will be done to fill in the questionnaire on the basis of what is collected following other reasons.

The candidate countries are in the process of adjusting their information system to the requests and demands of the EU. They are trying to incorporate these various information requests and are therefore in an intensive process of development and change with regard to their information system. Quite recent EU information requests on waste statistics — according to the waste statistics regulation published in 2002 — and on the new European integrated list of wastes (2001) have to be incorporated. At the same time information should be produced which should fit in with the historical data. It is obvious that the time series currently produced sometimes shows more the disturbance of the information production by changing the system than any real development.

The final but perhaps most important point concerns licensing and registering of enterprises. The transition phase starting in the 1990s led to an enormous amount of bankruptcies in industry but also to new formations and to a change in the property structure. State authorities in the candidate countries (Statistical Offices and Environment Ministries and their subordinated institutions) are not, up to this point, in the situation that registers are sufficiently built up. This is despite enormous efforts to register the existing and to delete non-active and non-existing enterprises from their registers and to license relevant enterprises[1]. This means in effect that all waste producers (and perhaps also waste treatment companies) are not yet included in waste reporting and the authorities still need time to achieve complete coverage.

Results

The country comparison in Chapter 11 clearly demonstrates that to a large extent the figures are not yet comparable. This is always the case when a lot of waste producers are operating and the differentiation between waste and non-waste is difficult (like in the construction sector). If there are only a few waste generators (energy production) the situation becomes more comparable.

(1) Thresholds for waste production exist in all countries. Companies producing wastes above this threshold must be registered and are relevant in this sense.

Annex I — Statistical Classification of Economic Activities in the European Community (NACE), Rev.1

Table 5.1

Statistical classification of economic activities (NACE) by sections (alphabetical letter A to Q)

Sec	Designation	Divisions
A	Agriculture, hunting and forestry	01 - 02
B	Fishing	05
C	Mining and quarrying	10 - 14
D	Manufacturing	15 - 37
E	Electricity, gas and waste supply	40 - 41
F	Construction	45
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	50 - 52
H	Hotels and restaurants	55
I	Transport, storage and communication	60 - 64
J	Financial intermediation	65 - 67
K	Real estate, renting and business activities	70 - 74
L	Public administration and defence; compulsory social security	75
M	Education	80
N	Health and social work	85
O	Other community, social and personal service activities[(a)]	90 - 93
P	Private households with employed persons	95
Q	Extra-territorial organisations and bodies	99

(a) Joint Questionnaire asks for data on division 90: Sewage and refuse disposal, sanitation and similar activities

Shaded cells: Sections for which data on waste generation are explicitly requested in Table 1 of the Eurostat/OECD Joint Questionnaire.

Table 5.2

Statistical classification of economic activities (NACE) by divisions (two-digit numerical code)

Sec	Div	Designation of division
A	01	Agriculture, hunting and related service activities
A	02	Forestry, logging and related service activities
B	05	Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing
C	10	Mining of coal and lignite; extraction of peat
C	11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction…
C	12	Mining of uranium and thorium ores
C	13	Mining of metal ores
C	14	Other mining and quarrying
D	15	Manufacture of food products and beverages
D	16	Manufacture of tobacco products
D	17	Manufacture of textiles
D	18	Manufacture of wearing apparel; dressing and dyeing of fur
D	19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
D	20	Manufacture of wood and of products of wood and cork, except furniture …
D	21	Manufacture of pulp, paper and paper products
D	22	Publishing, printing and reproduction of recorded media
D	23	Manufacture of coke, refined petroleum products and nuclear fuel
D	24	Manufacture of chemicals and chemical products
D	25	Manufacture of rubber and plastic products
D	26	Manufacture of other non-metallic mineral products
D	27	Manufacture of basic metals
D	28	Manufacture of fabricated metal products, except machinery and equipment
D	29	Manufacture of machinery and equipment n.e.c.
D	30	Manufacture of office machinery and computers
D	31	Manufacture of electrical machinery and apparatus n.e.c.
D	32	Manufacture of radio, television and communication equipment and apparatus
D	33	Manufacture of medical, precision and optical instruments, watches and clocks
D	34	Manufacture of motor vehicles, trailers and semi-trailers
D	35	Manufacture of other transport equipment
D	36	Manufacture of furniture; manufacturing n.e.c.
D	37	Recycling
E	40	Electricity, gas, steam and hot water supply
E	41	Collection, purification and distribution of water

Sec	Div	Designation of division
F	45	Construction
G	50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
G	51	Wholesale trade and commission trade, except of motor vehicles and motorcycles
G	52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods
H	55	Hotels and restaurants
I	60	Land transport; transport via pipelines
I	61	Water transport
I	62	Air transport
I	63	Supporting and auxiliary transport activities; activities of travel agencies
I	64	Post and telecommunications
J	65	Financial intermediation, except insurance and pension funding
J	66	Insurance and pension funding, except compulsory social security
J	67	Activities auxiliary to financial intermediation
K	70	Real estate activities
K	71	Renting of machinery and equipment without operator and of personal and household goods
K	72	Computer and related activities
K	73	Research and development
K	74	Other business activities
L	75	Public administration and defence; compulsory social security
M	80	Education
N	85	Health and social work
O	90	Sewage and refuse disposal, sanitation and similar activities
O	91	Activities of membership organizations n.e.c.
O	92	Recreational, cultural and sporting activities
O	93	Other service activities
P	95	Private households with employed persons
Q	99	Extra-territorial organisations and bodies

Shaded cells: Divisions for which data on waste generation are explicitly requested in Table 1 of the Eurostat/OECD Joint Questionnaire.

Annex II — Recovery and Disposal Operations

Recovery and disposal operations as defined in the Annexes II A and II B of the EU Waste Framework Directive 75/442/EEC:

Table 6.1
Disposal Operations

D 1	Deposit into or onto land (e.g. landfill, etc.)
D 2	Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.)
D3	Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.)
D 4	Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.)
D 5	Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)
D 6	Release into a water body except seas/oceans
D 7	Release into seas/oceans including sea-bed insertion
D 8	Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12
D 9	Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcination, etc.)
D 10	Incineration on land
D 11	Incineration at sea
D 12	Permanent storage (e.g. emplacement of containers in a mine, etc.)
D 13	Blending or mixing prior to submission to any of the operations numbered D 1 to D 12
D 14	Repackaging prior to submission to any of the operations numbered D 1 to D 13
D15	Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where it is produced)

Table 6.2
Recovery Operations

R1	Use principally as a fuel or other means to generate energy
R2	Solvent reclamation/regeneration
R3	Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)
R4	Recycling/reclamation of metals and metal compounds
R5	Recycling/reclamation of other inorganic materials
R6	Regeneration of acids or bases
R7	Recovery of components used for pollution abatement
R8	Recovery of components from catalysts
R9	Oil re-refining or other reuses of oil
R10	Land treatment resulting in benefit to agriculture or ecological improvement
R11	Use of wastes obtained from any of the operations numbered R 1 to R 10
R12	Exchange of wastes for submission to any of the operations numbered R 1 to R 11
R13	Storage of wastes pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending collection, on the site where it is produced)