DETAILED TABLES

ISBN 92-894-4496-7
Cat. N. KS-47-02-301-EN-N

2002 EDITION

Municipal waste management in Accession Countries

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EUROPEAN COMMISSION

eurostat

THEME8
Environment and energy

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Cataloguing data can be found at the end of this publication.

Luxembourg: Office for Official Publications of the European Communities, 2002

ISBN : 92-894-4496-7

Printed in Belgium

PRINTED ON WHITE CHLORINE-FREE PAPER

Preface

The European Union is facing one of the biggest challenges of its history: the forthcoming enlargement. The European Commission has recommended the accession of ten countries in 2004, the European Council will take position before the end of 2002. The aim is that they 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. The costs for cleaning up old dumping sites are so enormous that most EU countries have decided to first tackle only those sites which might actually be dangerous.

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 favourable 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 municipal waste carried out by LANDSIS g.e.i.e. between January 2001 and August 2002. The study assembles the information available on waste management in accession countries. In addition to the harmonised information regularly collected via the Eurostat/OECD joint questionnaire also additional sources are exploited to develop a comprehensive picture of each country. The intention was to give a thorough and comparable picture on waste management in the accession countries. The picture includes the description of state-of-the-art with relation to:

- Statistics, especially on municipal waste;
- Waste management;
- Waste management plans and strategies;
- Compliance costs;
- Legal and institutional framework.

The study is concluded with an outlook on further improvement foreseen or intended on waste management and waste statistics.

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 harmonised waste information.

Yves Franchet
Director general
Eurostat

Acknowledgement

This publication was prepared under the responsibility of Frans Kutsch-Lojenga, Eurostat. This project was funded under the PHARE Multi-country statistical co-operation programme, for which DG Enlargement has overall responsibility.

Publication Editors

Ulrich Wieland, Eurostat

Cees van Beusekom, Eurostat

Consultants

Joachim Thomas, LANDSIS g.e.i.e.

Karin Jordan, Argus GmbH

National Statistical Institutes

We would like to thank all the participants from the National Statistical Institutes that have contributed with information.

For further information please contact Eurostat:

Cees van Beusekom, Eurostat

Tel (352) 4301 - 35176

Fax (352) 4301 - 30039

E-mail Cornelis.van-Beusekom@cec.eu.int

Introduction

The study presented here is result of a Phare multi-country project, which also included the topics 'Farm structure', 'Employment in fishery sector', 'Agricultural supply-balance-sheets' and 'Environmental expenditures' (1). The project was carried out over a period of one and a half years, starting in January 2001.

The first aim of the project on municipal waste was to collect all information available and to help improve the quality and quantity of information collected via the Eurostat/OECD joint questionnaire.

It is obvious that availability and quality of information on waste depends to a huge degree on several conditions.

- Availability of technical conditions (e.g. weighing bridges) for registering wastes;
- Organisation of waste management;
- Waste information compilation and book-keeping on enterprise level;
- Registering of enterprises in central registers like business register;
- Reporting obligations and reporting forms for enterprises;
- Competence and engagement of the involved experts;
- Adequate distribution of working fields and responsibilities for the experts in the administration.

All the conditions mentioned above do certainly influence data availability and quality and therefore all must be developed in a favourable way. This is not possible in a short term perspective but needs a long term perspective. One very important and often neglected task is to keep the country experts motivated and engaged. This we tried also at the workshops.

In the framework of the project three workshops were carried out.

- 'Waste reporting obligations and problems to fulfil' (June 2001 in Bled/Slovenia);
- 'Specification of priority activities to improve information' (November 2001 in Budapest/Hungary);
- 'Methodology development and data quality' (June 2002 in Kalvi/Estonia).

Besides the fact that the workshops were technically necessary in order to clarify demands and to lead direction of improvement, the workshops were also very important in establishing relations and increasing involvement in the topics.

The first chapter of the study is a description of the situation of waste management in the 12 accession countries. All information available at EU and national level was used to prepare this information. The following chapter deals with data on municipal waste management that was collected with the Joint Questionnaire. The study concludes by a chapter that provides an outlook, trying to assemble the most important elements of current and future waste management and statistics in accession countries. Finally, the annex gives a complete overview of the current EU waste reporting obligations.

(1) For each topic is a separate publication available which can be requested from Eurostat or from LANDSIS g.e.i.e.

Current situation of waste management in accession countries

Bulgaria

Basic information waste management

Statistical data shows that in 1995-97 the average annual amount of generated municipal waste was 500 kg per capita. Findings from separate research on the household-generated waste for the period 1994-97 show quantities of 230-400 kg of waste per capita. The waste is not weighed at the landfills' gates and the data submitted to the municipal administration is based on the number of loading and waste transportation trips. In 1999, data about the total quantity of municipal solid waste generated show approximately 3.2 million tons of waste or some 390 kg per capita. The improvement of data reliability is a result of the overhaul carried out by municipalities.

Major actions in this direction are: introduction of weighing bridges at landfills; better reporting and increasing municipal control over the service providers companies; comparison between declared quantity and frequencies of waste collection and the volume of the bins [1]. From 2002 the NSI started a survey for the money collected from the wastes taxes.

In 1997, 1126 settlements (one quarter of all settlements in the country) were covered by an organised waste collection and transportation system. These settlements represent 77% for year 2000 of the population, and that means that many villages are not covered by the organised system of collection and transportation of municipal solid waste.

The only applied waste treatment method is landfilling. The number of landfills for organised collection is 680. Operating landfills, with a few exceptions, do not comply with modern requirements. According to data for 1999 from the municipal administration, 57 of the existing landfills contain some 70% of the total quantity of municipal solid waste. Each one of these sites serves a population of over 20000. There are no municipal waste incinerators and composting plants in rural areas.

A serious problem that municipal officials face is the lack of success in the separate collection of waste. Despite numerous attempts there is no municipality that collects waste separately [2].

The decrease in industrial production during the past ten years led to considerable reduction of generated industrial waste. According to the Bulletin of the National Statistical Institute the industrial waste generated in 1998 was 176 million tonnes of which 167 million tonnes were wastes resulting from mining and quarry and 8.6 million tonnes from other industrial activities [3]. In 2000, the generated amount of industrial waste decreased to 92.8, mainly due to a reduction of mining and quarry waste.

In the structure of the industrial waste the share of waste from oredressing plants is highest followed by thermal power plants and the chemical industry. Mines in a liquidation or conservation stage represent a special problem. In most of them, the problem of a large quantity of waste stored in tailings ponds remains unsolved.

The prevailing method of treatment of industrial waste is landfilling. Over 99% of the total quantity of industrial waste is disposed of in sites on the premises of the plants, and the rest is disposed of together with municipal solid waste in urban landfills.

For reprocessing mainly waste from the production and processing of plastics, paper, cardboard and metals is collected.

The information presented by the enterprises reveals that ferrous and non-ferrous metal, paper and glass waste are most often subject to recycling. Depending on the organisation of activities within the respective industrial units the waste collected is directly transferred to recycling companies or to licensed companies trading with recyclable waste.

With regard to hazardous waste, available information on the amount generated varies annually between 800000 tonnes [4] for the period 1997-1999 and about 1.3 million tonnes [5] for recent years.

This data is based on the around 2800 annual reports produced by the enterprises generating hazardous waste. The presented data was collected, processed and reported in accordance with the national catalogue on hazardous waste, which was valid until the end of 1998. The national catalogue was not in full compliance with the European list on hazardous waste adopted with the EU Decision 94/904/EC.

Thirty enterprises generated over 90% of the annual quantity of hazardous waste. Three of them reported 51% of the hazardous waste generated in 1999. Thermal processes, petrol production and wastewater treatment plants generated the highest quantity of hazardous waste. The absence of an established national laboratory system for hazardous waste does not allow for a more precise identification and control of this type of waste.

The main method for hazardous waste treatment is disposal (77% of the total amount of hazardous waste disposed) in landfills on site of the enterprises. The analyses show that most of these sites have exceeded their capacity and do not comply with modern requirements laid down in the national waste legislation that is harmonised with the requirements of the respective EC directives.

Existing incineration installations hardly satisfy the needs of the companies they were built for. Some cities (regional centres) have built small installations for the incineration of hospital waste. In most cases they do not comply with the requirements for such installations and therefore treat waste only from some of the hospitals in the region.

(1) National strategy for the environment and action plan 2000-06, Republic of Bulgaria, Sofia, 2001.
(2) National strategy for the environment and action plan 2000-06, Republic of Bulgaria, Sofia, 2001.
(3) Statistical bulletin on the environment 1999, National Statistical Institute, 2000.
(4) National strategy for the environment and action plan 2000-06, Republic of Bulgaria, Sofia, 2001.
(5) National strategy, Environment sector (ISPA strategy for the environment), Ministry of the Environment and Water, October 2000.

A large number of small enterprises that generate hazardous waste have serious problems due to the lack of regional or national infrastructure for its treatment. Storage of hazardous waste on the premises of these enterprises is a usual practice.

Waste management planning and strategy

Waste

In Bulgaria, waste management strategy is tackled in several documents: national development plan until 2006 (sector programme 'Environment'), the ISPA strategy paper for the environment, the national waste management programme and the national strategy for the environment and action plan.

The national waste management programme for the period 1999-2002 has been adopted. It formulates the measures regarding the transposition and the implementation of the directives, requirements and decisions of the EU in the field of waste management, together with the duties and responsibilities of the competent authorities concerning the EU legislation implementation. The state of waste management has been analysed, the problems have been identified and the objectives have been chosen. An action plan has been developed stating the measures required in short and medium-term perspectives, the institutions responsible and the financial means needed for programme implementation.

The national waste management policy envisages the establishment of a system of regional landfills, which will gradually replace the existing system of more than 2500 municipal waste landfills. The national waste management programme envisages, inter alia, the construction of 37 regional landfills which will serve about 33 % of the population, the establishment of a national hazardous waste disposal centre and a system of regional landfills for hazardous waste.

In addition, an obligatory requirement for waste management planning for the municipalities and companies which carry out waste management activities is to be legally established.

The majority of Bulgarian municipalities have adopted their own waste management programmes. At present 250 municipal waste management programmes (92 %) have been approved and presented to the Ministry of the Environment and Water (MOEW). In preparing the programmes municipalities followed the methodological guidelines of the MOEW. Although, in some cases, programmes do not meet the professional level required, they do help to speed up the resolution of problems and represent an important step in waste management at local level.

Pursuant to the Bulgarian waste framework law (RHIWEA) not only the municipalities but also the firms, which generate waste over a fixed quantity, are obliged to prepare their waste management programmes following the methodological guidelines of the MOEW. These programmes are a useful instrument not only for firms as through them, regional inspectorates of the environment and water (RIEWs) and the municipal administration may receive a clearer picture of the industrial, construction and hazardous waste on the territory of the region/municipality.

Expenditure

An investment plan was drawn up for the projects' implementation. A considerable part of the developments in the investment plan are being implemented or are in the preliminary phase of preparation of necessary documentation. The main developments from the plan were included in the list of investments projects of the ISPA strategy on the environment - six regional landfills, two of them combined with hazardous waste cells, a national centre for the treatment of hazardous waste and installations for solid waste treatment in the capital. A number of projects from the programme are financed with national and donor sources.

Municipal waste user charges are set by the municipality based on the value of the property. The revenue goes to municipal budgets. Product charges related to batteries and tyres are EUR 0.05 – 0.5 per kg. This revenue is collected by the National Environmental Fund [(1)].

The present levels of environmental expenditures do not cover all waste management costs in order to guarantee the protection of the human health and the environment. Municipal solid waste fees collected at the municipal level do not cover all the costs for collection and disposal of waste as required by the legislation (national strategy, 2001).

Legal and institutional framework

Legislation

The adopted Law on Reduction of the Harmful Impact of Waste on the Environment (RHIWEA), together with the regulations foreseen in it, creates the legislative basis for transposition and implementation of the EU legislation in the waste management sector. In accordance with this framework law, a number of regulations have been developed and adopted during the period 1998-2000. They regulate specific aspects of waste management and administrative procedures, institutions, provision and reporting of information. They ensure the harmonisation of the national legislation with the EU legislation regarding specific types of waste and installations for waste disposal.

- Law on Reduction of the Harmful Impact of Waste upon the Environment - 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);
- Regulation No 11 on the conditions and requirements for the construction and operation of municipal waste disposal facilities and installations (State Gazette No 152/1998);
- Regulation No 12 on the requirements which must be met by the waste treatment facility sites (State Gazette No 152/1998);
- Regulation No 13 on the conditions and requirements for the construction and operation of waste landfills (State Gazette No 152/1998);

(1) Waste management policies in central and east European countries: Current policies and trends, DHV CR Ltd, Prague, 2001.

- 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 (dated 13 November 1998);
- Regulation on the requirements for treatment and transportation of industrial and hazardous waste (adopted with Decree of the Council of Ministers (DCM) No 53 from 1999; State Gazette No 29/1999);
- Regulation for the cases when a permit is required for the import, export and transportation of waste and the conditions and order for issuing permits (State Gazette No 6/ 2000);
- Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal (ratified by Act of the 37th National Assembly on 18 January 1996, in force since 16 May 1996);
- Regulation on the requirements for the treatment and the transportation of waste oils and oil products (adopted with DCM No131/2000, State Gazette No 59/2000);
- Regulation on the requirements of the soil protection when sewage sludge is used in agriculture (adopted by DCM No 262/2000 of the Council of Ministers, State Gazette No 101/2000);
- Regulation on the requirements on production and presenting to the market batteries and accumulators and on the treatment and transportation of spent batteries and accumulators (adopted with DCM No 134/2000, State Gazette No 61/2000).

Pending regulations

- Regulation on the limitation of the quantity of packaging waste in the waste flow. The requirements of the Directive 94/62/EC on packaging and packaging waste will be introduced in the national legislation by the end of 2002;
- Regulation on the requirements for the disposal of polychlorinated biphenyls and polychlorinated terphenyls. The requirements of the Directive 96/59/EC on disposal of PCBs and PCTs will be introduced in the national legislation till the end of 2002;
- As regards the directives on waste from the titanium dioxide industry, it is envisaged that the requirements of the directive for new installations will be introduced in the national legislation during the period 2002-03. At present there is no titanium dioxide industry in Bulgaria.

Institutional framework

The Ministry of the Environment and Water is the competent authority, responsible for the development and implementation of the national waste management policy.

The Ministry of the Environment and Water prepares and presents for approval to the Council of Ministers a national waste management programme and carries out the overall responsibility for its implementation. The ministry also prepares an annual report on waste management, which is included in the 'State of the environment report'. It participates in the financing of waste management projects by providing grants and credits from the National Environmental Protection Fund.

The Executive Environment Agency within the Ministry of the Environment and Water, is responsible for the collection and processing of data on waste management generation and disposal. The agency is also responsible for the development of waste characterisation standards and the establishment of a national laboratory system for waste and for elaborating methodological guidelines for the regional inspectorates as regards the measurements and the analyses of waste.

Other national ministries also have responsibilities in the waste sector, these include:

The Ministry of Agriculture, Forests and Land Reform (MoAFLR) is the competent authority on management of the agricultural wastes. The Ministry of Regional Development and Public Works (MoRD) is the competent authority with regard to development of legislation that should be met by waste treatment facilities, requirements on the construction and operation of equipment and installation for disposal of municipal solid waste and the conditions and requirements for construction and operation of landfill sites. The MoRD together with the MoEW annually acquire funds from the state budget for construction of facilities and installations for treatment of municipal solid waste. The Ministry of Transport (MoT) is the competent authority on hazardous waste transportation. The Ministry of Industry (MI) is the competent authority for the management of waste at company level and issuing licenses for trade activities with ferrous and non-ferrous metals. The National Statistical Institute is the official public institution dealing with data collection and processing of quantities and sources of waste, environmental expenditures, information collected according specific questionnaires, etc.

On the regional level, the regional inspectorates of the environment and water (RIEWs), are the ministry's specialised bodies for environmental control. The RIEWs are responsible for the issuing of permits for waste management activities and for the operation of waste disposal installations. They are also responsible for checking the documentation and reporting requirements and for the conducting of periodic inspections of waste disposal installations.

The staff of the 15 RIEWs will be increased gradually before the end of 2003 and adequate and sufficient training will be provided in order to ensure the effective control of the implementation of the landfill directive.

The municipalities organise and control the generation, collection, storage, transportation and disposal of municipal and construction waste, and the implementation of programmes thereof; the landfilling of industrial and hazardous waste. The municipal councils adopt regulations setting forth the procedures and conditions for collection, loading, storage, recovery and disposal of municipal and construction waste on their territory. They also set the local fees and charges for waste collection, transportation and disposal. The municipal councils approve and present to RIEW the municipal waste management programmes to the RIEWs.

According to the national strategy for the environment [1] most of the smaller municipalities do not have a specialist to deal with waste management. Some of them have not even appointed an environmental specialist. A few municipalities have appointed inspectors to perform control activities.

(1) National strategy for the environment and action plan 2000-06, Republic of Bulgaria, Council of Ministers, Sofia, 2001

Legal waste information requests

After the new RHIWEA and respective regulations came into force, a certain improvement of the reporting on waste has been observed.

First, data collection complies with the European catalogue of waste.

A system of reporting has been introduced for producers of industrial and hazardous waste who are obliged to maintain registers of generated and treated waste. To meet this obligation companies establish internal information systems on waste. In addition, they prepare and submit annual reports to the EEA on company's waste management.

The same requirements apply to operators of municipal landfills. Landfill operators and municipalities are obliged to report the types of waste.

Additional stricter requirements have been introduced on hazardous waste management including the issuing of permits for all activities concerning hazardous waste and for facilities and installations for their disposal. An obligation for registering and reporting, and demanding documentation for accepting, submitting and transportating hazardous waste has been introduced.

Regulation No 10 on the filling out of the report and the waste management information documents sets out the procedure for the filling out of all documents concerning the reporting and information related to the waste management activities:

Annual reports:

Information form to be filled out by industry	
Industrial waste report	Annex 2 of Regulation No 10 referring to Article 7
Hazardous waste report	Annex 3 of Regulation No 10 referring to Article 7
Hazardous waste declaration	Annex 5 of Regulation No 10 referring to Article 9
Information form to be filled out by municipalities who shall provide the data from the companies contracted for waste collection and landfill operation	
Household Waste Report	Annex 8 of Regulation No 10 referring to Article 13
Construction Waste Report	

All report forms are filled out for the preceding year in several copies and submitted to a RIEW at the latest by 31 of March of the current year.

Record to be kept for diverse activities:

Report book for industrial and hazardous waste	Report book to be filled out autographically at least once a week by persons generating industrial waste (>100 kg/0.1 m³ daily), generating hazardous waste or treating waste. The report book shall be certified and inspected by the RIEW at least once a year (Annex 1 of Regulation No 10 referring to Article 6)
Report form for delivery, transportation and reception of hazardous waste	Document that shall be kept by the specialised companies carrying out the activities of collection, transportation and disposal of waste (Annex 6 of Regulation No 10 referring to Article 11)
Reporting book for landfill	Information form to be filled out for landfills by municipalities (Annex 7 of Regulation No 10 referring to Article 15)

Documentation stipulated by other legal regulations:

- Reference data sheet on batteries and accumulators to be filled out annually by producers and importers of batteries and accumulators (Annex 6 referring to Article 33 of Regulation on spent batteries and accumulators);
- Form for the notification of transboundary movement of waste and movement document on transboundary movements of waste these notifications concern: single movement, general notification, disposal, recovery of waste, (Annex 5 referring to Article 7 of Regulation for the cases when a permit is required for the import, export and transportation of waste and the conditions and order of the issuing of the permit, notification document and movement document according to the Basel Convention).

Waste information collection

In Bulgaria, statistical data on waste management are available from two sources: the National Statistical Institute (NSI) and the Executive Environmental Agency (EEA).

The Bulgarian National Statistical Institute (NSI) collects data on household, construction and industrial waste. The register of the National Statistical Institute is used for determination of reporting units. It does not contain information on all registered enterprises. The information is adapted for statistical purposes, about 6500 units are registered.

Up to and including 1998 inclusive, the monitoring of industrial waste was carried out according to the National Statistical Institute nomenclature that included 82 types of waste. In 1998, a nomenclature harmonised with the European waste catalogue (EWC) was introduced. The National Statistical Institute is carrying out two annual surveys on waste generation and destination, distinguishing between disposal and treatment processes. The survey on municipal waste, construction and demolition waste is referring to the municipal administration and landfill operators, and the survey on industrial wastes is referring to relevant enterprises.

The questionnaire on municipal waste and construction and demolition waste is structured as follows: Municipal wastes "collected on the landfill" are registered in the first two columns together with their EWC codes. Data is also collected on the "settlements which are served by the landfills", but not on the amounts coming from each settlement. The total amount is

then differentiated in three types of treatment (incineration, other treatment, landfilling). The second part of the questionnaire concerns construction and demolition waste. Again the total and the treatment types (treatment versus landfilling) are specified. Finally the third part of the questionnaire asks for the landfill characteristics (type, area covered and capacity) and the type of waste collection (organised/non-organised).

The Executive Environmental Agency collects and processes data on hazardous waste and on the other types of waste specified in the RHIWEA and Regulation No 10 from 1998. Regulation No.10 is aimed at receiving complete and reliable waste management related information by defining the procedures of documenting and reporting of data, as well as obligations of the persons generating, transporting and/or treating wastes. Information on waste generation, classified according to the EWC, and waste destination (i.e. treatment, disposal, export) is collected by the regional environment inspectorates and further processed by the Executive Environmental Agency (EEA).

At the end of the 1980s and the beginning of the 1990s in relation to the implementation of some specific projects, several investigations on the municipal waste composition were carried out in some municipalities (e.g. Varna, Sofia, Veliko Tarnovo). In the period 1992-2000 several investigations on municipal solid waste composition were accomplished in several towns in the country. However, the results of the investigations on the composition of municipal solid waste show extreme differences with regard to average waste arisings per capita/year and particular differences for certain components in MSW such as plastics and metals [(1)].

International reporting

The Republic of Bulgaria has signed and ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal. Permit procedures, required by the convention, were successfully transposed.

The Ministry of Environment and Water is designated as a national competent authority on the permitting and supervision on shipments of waste. The State Customs Agency through the applied border control assists the Ministry in the implementation and the enforcement of the requirements on transboundary shipments of waste. An adequate and sufficient training will be provided for the officials involved in the implementation of the convention's requirements in the period until accession.

Selection of documents

- National strategy for the environment and action plan 2000-06, Republic of Bulgaria, Council of Ministers, Sofia, 2001.
- National strategy, Environment Sector (ISPA strategy for environment) Ministry of the Environment and Water, October 2000.
- Intergovernmental conference on the accession of the Republic of Bulgaria to the European Union, negotiating position on Chapter 22 Environment, (http://www.moew.government.bg/europe/europe.html).
- Bulgarian waste management legislation, Ministry of the Environment and Water, Republic of Bulgaria, 2001.
- National waste management programme, Ministry of the Environment and Water, Republic of Bulgaria, 1999.
- Environmental performance review Bulgaria - Second review (Chapter 3 on 'Sources of finance for environmental protection investments' and Chapter 6 on 'Development of reliable waste statistics'); United Nations, New York and Geneva, 2000.
- Statistical bulletin on the environment 1999, National Statistical Institute, 2000.
- National strategy for waste recycling in Bulgaria, Ministry of Environment and Waters, Phare PMU, Tebodin B.V. and POVVIK-EP Ltd, Sofia 1998.
- Waste characterisation trial (WCT) for Sofia municipal solid waste (MSW) according to Phare contract BG 9310-04-03-02, Sofia municipality and POVVIK-EP Ltd, Sofia, 1997/98.
- Waste management policies in central and east European countries: Current policies and trends, DHV CR Ltd, Prague, 2001.
- ECOTEC: Administrative Capacity for Implementation and Enforcement of EU Environmental Policy in 13 Candidate Countries, Sub-study Assignment Request No. 6, Final Report to DG Environment, Brussels 2001.

Questionnaires from the National Statistical Institute:

- questionnaire on municipal waste to be filled out by municipalities;
- questionnaire on industrial waste to be filled out by enterprises.

Institutions and contacts

Institutions	Contacts
National Statistical Institute	http://www.nsi.bg
Ministry of the Environment and Water	http://www.moew.government.bg

(1) Database on packaging and packaging waste in Bulgaria, ARGUS GmbH, MD Urboproject, German Federal Environmental Agency, 2002, not published.

Czech Republic

Waste management

A statistical survey [1] revealed that the generation of waste in 2000 reached a total of 44 million tonnes. The amount has risen by 5 % in comparison to 1999. Activities of enterprises, which accounted for 40.2 million tons of waste, are the reason for this increase. During the same period, the generation of hazardous waste grew by 0.2 million tonnes to stand at 2.6 million tonnes or 6 % of the total amount of waste. Only 7.9 % of the country's waste was classified as municipal waste.

Landfilling is still the most extensively used method of waste disposal. In 2001, 161 landfills for municipal waste and 46 ones for hazardous waste were in operation. These are exclusively landfills of a high technical standard, in line with EU requirements. Several large landfills are equipped with methane collection technology. In the same year, waste was incinerated in 75 combustion facilities. The Czech Republic has an adequate capacity in installations for waste disposal. Difficulties are associated with the decontamination and reclamation of old landfills [2].

The most important sources of non-hazardous industrial waste in 1999 were agriculture and food processing (12 million tonnes), the production of electricity and the construction branch [3]. Of the non-hazardous waste disposed of by enterprises in the year 2000, 23 % was used as a secondary raw material, 1.7 % was recycled. Some 20 % was treated with biological methods, 25 % was landfilled and only 1.9 % was incinerated [4].

Co-incineration in cement plants is a common method of energy recovery. In 1999, 100000 tonnes of plastic, 18000 tonnes of tars, 12000 tonnes of waste oils and 4000 tonnes of solvents were used as a substitute fuel in cement plants. Another 8000 tonnes of solvents were incinerated in ironworks [5].

Important imported fractions of industrial waste were textiles and clothing, tyres, plastics and ash from burning coal. On the other hand, the Czech Republic exported 6200 tonnes of ash, slag and cinders from combustion equipment, and 1600 tonnes of textiles and clothing [6].

The high share of hazardous waste in the Czech Republic is partly the result of the current classification under Czech legislation, which is stricter than EU law. In 1999, the most important producers of hazardous waste were combustion equipments, pyrolytic coal processing, and the surface treatment of metals.

Of all the hazardous waste generated by enterprises in the year 2000, 35 % was used as a secondary raw material. Another 1.5 % was recycled. 10 % had to undergo a chemical treatment, 8.9 % a biological decontamination. 12 % was deposited in landfills, 4.6 % was sent to underground deposition. Only 1.7 % was incinerated as energy recovery in this process was common.

The five major hazardous waste incineration plants are operated by industry. There are refineries for the extraction of lead from lead batteries. The collection rate for this kind of waste stands at about 80 % [7].

Waste oils are collected separately as well. In 1999, 14 % was incinerated without preliminary treatment, 74 % had to undergo a physical or chemical treatment (mainly filtration or dewatering) in order to be used as an alternative fuel. Some 12 % was stored before further recovery and only 0.2 % was subject to regeneration. Landfilling and underground deposition are not permitted.

In 1999, no hazardous waste was imported, while 810 tonnes were exported, especially Ni-Cd accumulators and waste containing solvents or PCBs (polychlorinated biphenyls). Alkaline batteries are exported to Sweden.

The Czech Republic is very concerned about waste containing PCBs. It is estimated that the weight of used oil and other wastes with a PCB content of more than 50 ppm amounts to 65000 tonnes. Thus the Ministry of Environment considers it necessary to carry out an inventory of facilities containing PCBs and to prepare a national plan for the management of this kind of waste.

From January 2001 till March 2001 a Dutch-Czech project, "Development for a national plan for hazardous waste for the Czech Republic" was carried out. It was based upon the open planning procedure used in the Netherlands, the particularity of which is the wide group of stakeholders involved.

In the year 2000, municipalities generated 3.4 million tonnes of waste 0.8 % of which was to be classified as hazardous. The amount of hazardous components grew by 100 % in comparison to 1999. Some 55 % of all the municipal waste was recycled, of which 81 % iron scrap, 14 % glass and 5 % non-ferrous metalso.

The Czech municipalities have achieved favourable results in the separation of the hazardous compounds of communal waste. Since 1998, they have been obliged to provide a place where citizens can deposit waste containing hazardous substances.

Since the Czech Republic is connected with western European markets, non-returnable packaging, mainly consisting of PET (polyethylene terephthalate) bottles, is penetrating the Czech market, whereas the traditional deposit schemes for glass beverage bottles play a decreasing role. The amount of packaging waste continues to increase after reaching the European average level of 84 kg per inhabitant in 1999. Plastics (40 %), paper (26 %) and glass (12 %) are the packaging materials used most. Plastics dominate in the form of carrier bags and bottles for soft drinks. Practically all producers of mineral water have built manufacturing lines using PET bottles. Nevertheless, 70 % of all beverage packaging still consists of glass. Returnable glass bottles maintain a strong position in packing beer and wine.

(1) 'Generation, treatment methods, utilisation and disposal of waste in 2000', Czech Statistical Office, Prague, 2001.
(2) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, 2001.
(3) 'Statistical environmental yearbook of the Czech Republic 2000', Czech Statistical Office, Prague, 2000.
(4) 'Generation, treatment methods, utilisation and disposal of waste in 2000', Czech Statistical Office, Prague, 2001.
(5) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, 2001.
(6) 'Statistical environmental yearbook of the Czech Republic 2000', Czech Statistical Office, Prague, 2000.
(7) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, 2001.

In order to recover packaging waste, EKO-KOM was founded in 1999. It is a voluntary association of companies that produce or use packaging. Industry, retail and municipalities are its main contractual partners. EKO-KOM collects charges from producers, importers and retail and redistributes this money to municipalities depending on the amount of separately collected waste. The aim of EKO-KOM is to pay all communal financial losses related to separate collection and recovery of the packaging component of municipal waste.

Two years after its foundation EKO-KOM has come to cover about 60 % of the population of the Czech Republic. The collection rates in the first quarter of 2001 were 66 % for glass containers, 57 % for paper packaging, 19 % for plastics and 7 % for metal scrap. This represents in total about 40 % of all packaging materials. EKO-KOM estimates that in 2005, 53 % of all packaging waste will be recycled and 59 % recovered. Transport and grouped packaging are returnable on the basis of agreements between suppliers and consumers, predominantly for economic reasons.

Because of the problems PVC imposes in waste disposal, the Czech Waste Act prohibits the manufacture and import of any packaging made of this plastic.

Waste management planning and strategy

Waste management strategy

The Ministry of the Environment considers it necessary to prepare waste strategies in accordance with the requirements of the EU directives. According to the new Act on Waste, national and regional waste management plans must be elaborated. The first national waste management plan has to be prepared by the end of 2002. Producers of more than 10 tonnes of hazardous waste or more than 1000 tonnes of other waste are obliged to draw up a waste management plan as well.

Guiding principles of the Czech waste policy are the prevention of waste generation, increased information for consumers, the implementation of economic instruments, and the development of effective product take-back systems.

Special attention is given to more effective collection, storage and reprocessing of used oil, batteries and accumulators, fluorescent tubes and discharge lamps, tyres and used packaging.

Economic tools are considered to be very efficient. Customers and enterprises can employ a lower VAT rate of 5 % for recycled paper and the production of biogas. Properties and structures used exclusively for recycling purposes are exempt from property taxes.

Expenditure

In the year 2000 Czech enterprises spent CZK 10 billion on waste management [(1)]. Waste disposal costs amounted to CZK 5.6 billion. The Environmental Fund had an income of CZK 190 million out of waste management activities and spent CZK 240 million on waste projects [(2)].

Disposal charges are divided into two parts – a base rate and a "risk rate" for hazardous waste. This is an incentive to avoid the use of hazardous substances in production or to collect them separately. The base rate is collected by municipalities and used as a part of the municipal budget. The risk rate contributes to the revenue of the State Environmental Fund. Disposal charges will increase gradually during the next years.

The State Environmental Fund, established in 1991, is partly financed from fees (e. g. for waste disposal). During its working period, it supported more than 100 projects in the sphere of waste management.

Legal and institutional framework

Legislation

The Act on Waste and amendment of some other Acts was adopted by Parliament on 15 May 2001. It obliges waste owners to prevent the production of waste, and to reduce its volume and dangerous properties. Waste, the production of which cannot be prevented, must be recovered or disposed of in a manner not endangering human health and the environment. In principle, waste recovery is prior to waste disposal. Material recycling has priority to any other recovery. Waste may be landfilled only after a treatment (except some waste types specified in a legal regulation). The Ministry of the Environment publishes a list of wastes that are not accepted in landfills and sets up standards for the technical equipment of landfills.

Natural persons have the duty to collect waste separately. The municipality must secure a site where citizens may discard dangerous components of municipal waste.

According to the law, waste produced in the Czech Republic shall primarily be recycled or disposed of at inland facilities. The import of waste for disposal and for energy recovery is forbidden, the export to non-EU and non-EFTA countries is banned. Specified kinds of waste may not be exported at all. Import, export and transit must be approved by the Ministry of the Environment and covered by a financial guarantee or an appropriate insurance.

Operators of facilities for waste collection, purchase, recovery and disposal have to appoint a waste manager, verify hazardous waste properties, sort waste by type and category, and keep operating records.

Disposal plants must not exceed specified emission limits. Their operators have to publish a list of wastes for which they are authorised. Landfill owners must create and maintain a financial reserve for the landfill's re-cultivation after use. They have to archive records of the deposited wastes during the operating period and for 30 years after the landfill's closure.

Waste may be incinerated only according to the legal regulations on air protection and energy management.

The Act on Waste also regulates the handling of waste containing special substances, like PCBs, asbestos, waste oils, batteries and accumulators, sewage sludge, end-of-life vehicles and waste from the titanium dioxide production.

Owners of waste and equipments containing PCBs must ensure their disposal as soon as possible, but not later than in 2010. Disposal is only possible in facilities designed for such purposes. A

(1) 'Statistical Environmental Yearbook of the Czech Republic 2000', Czech Statistical Office, Prague, 2000.
(2) 'Generation, treatment methods, utilisation and disposal of waste in 2000', Czech Statistical Office, Prague, 2001.

decree will regulate the technical requirements for the management of PCBs, laboratory methods of determining the PCB concentration, and a labelling method for equipment containing PCBs.

Producers of waste oils must act according to the priorities of:

1. regeneration;
2. combustion;
3. storage or disposal.

The Ministry of the Environment issues a decree regulating technical requirements for waste oil management.

Merchants of batteries and accumulators containing hazardous substances must ensure separate gathering, recovery and disposal. Manufacturers and importers must provide information on the take-back system, their heavy metal content and the dangers connected with their illegal disposal. They also have to design products in a way that consumers can easily remove used batteries and accumulators. The manufacture and import of batteries and accumulators containing more than 0.0005 % of mercury (by weight) is strictly forbidden.

The Act on Waste allows the use of sewage sludge in agriculture only after a treatment which reduces the number of pathogen organisms significantly. Operators of wastewater treatment plants must set up a sludge use programme. Farmers fertilising their fields with sewage sludge have to take into account the plants' nutritious requirements and must not impair the quality of soil and water. On special soils the use of sludge is forbidden, e. g. in forests or in water protection areas.

Producers of titanium dioxide must draw up a waste management plan, including the aspects of air pollution control and wastewater treatment. They have to monitor specified indicators for wastewater and air emissions, and subsequently report them to the competent district office.

Waste containing asbestos may only be disposed of in landfills designed for this purpose. This kind of waste must be treated and packed before its disposal, or immediately covered after its disposal. Everyone who handles asbestos waste must ensure that particles are not released into the air.

Citizens obtaining end-of-life-vehicles must deliver them exclusively to facilities authorised for their recovery, disposal, collection or purchase. Operators of old vehicle treatment plants have the duty to remove all parts containing lead, mercury, cadmium, hexavalent chromium and operating fuel, so that the mass resulting from shredding will not display any hazardous properties. The Ministry of the Environment issues a decree about the technical requirement for end-of-life vehicle treatment plants.

Part 5 of the Act on Waste regulates take-back duties for certain products: manufacturers, importers and sellers of mineral oils, tyres, household refrigerators, batteries and accumulators, discharge and fluorescent tubes are responsible for the installation of a take-back system. They have to organise the system and provide it with the necessary technical equipment at their own account and are prohibited to charge consumers and municipalities. Retailers have the task to inform their customers about the use of this system.

In 2003, the Czech Republic's waste legislation will meet all EU standards, except the area of packaging waste.

Institutional framework

The Ministry of the Environment executes the supreme State supervision in the area of waste management. It is the competent body for the import, export and transit of waste. It takes decisions in cases of doubt concerning the classification of waste, and it proceeds concepts of waste management.

The Ministry of Health is involved in the issue and withdrawal of authorisations for experts evaluating the hazardous properties of waste. In cooperation with the Ministry of the Environment and the Ministry of Agriculture, it issues a decree about the conditions for the agricultural use of sewage sludge.

The Czech Environmental Inspectorate controls whether persons, enterprises and municipalities observe legal regulations. It levies fines for violating the set obligations. Disposal installations for hazardous waste may only be operated with the approval of the respective District Authority. The latter keeps and compiles records of wastes, and informs the public about these figures. It may secure the disposal of waste at the cost of the producer should there be a threat to the environment. It may forbid a waste producer to carry out an activity that could damage the environment. It issues statements concerning the establishment of a waste disposal installation.

The municipality may issue a binding notice about the system of collection, sorting, use and disposal of municipal waste in its territory. Municipalities may require natural persons to give proof how they have managed municipal waste. They determine rates of payment for the collection, sorting and disposal of municipal waste.

Legal waste information requests

Section 39 of the Act on Waste contains rules for the recording and notification of waste. It determines that producers and authorised persons who manage waste have to keep continuous records of type, volume and method of management of the waste. The ministry has laid down the method of keeping records in a decree.

Producers of more than 50 kg of hazardous waste or more than 50 tonnes of other waste per year must send annual reports on the type, volume and methods of management of this waste to the respective district authority. The same obligation applies to authorised persons who collect, purchase, treat and dispose of waste. The district authority must proceed and keep records on the basis of the producers' reports and has to send them to the ministry by 31 May of the following year. Everyone has the right to examine the data collected by the district authorities.

As to the shipment of hazardous waste, domestic carriers and consignors of waste have the duty to send a consignment form to the district authority. The consignee must confirm that he has received the waste on the consignment form and send it to the consignor and the district authority. In case the consignor does not receive a confirmation, he has to inform the respective district authority and the Czech Environmental Inspectorate.

The responsible persons of the obligatory take-back systems for tyres, mineral oils, household refrigerators, batteries and accumulators, discharge and fluorescent tubes (according to Section 38 of the Act on Waste) must prepare an annual report to the Ministry of the Environment.

Waste information collection

Every year, the Czech Statistical Office carries out a survey on industrial and municipal waste. Responding units are about 600 random sampled municipalities with 200 inhabitants or more and enterprises with 20 employees or more. (Enterprises under NACE 90 are already asked when they have five employees.) For waste of every code, each company has to provide information about its generation in kilogrammes and its disposal method. The treatment costs are surveyed as well.

In September 2002, all municipalities have to take part in a census of water supply and sewerage systems (Vak 2002). The Statistical Office plans to include a short annex on municipal waste. All cities and communes have to answer which parts of municipal waste are collected separately, and which companies are in charge of the collection, transport, sorting, recycling and removal of municipal waste and its hazardous components. Above all, the statisticians expect more detailed data about the treatment of municipal waste from this census, because for this area the grossing-up method is not practicable. They also want to establish a set of authorised operators of municipal waste. These waste-handling enterprises will be sent a more detailed questionnaire.

A new database of landfills shall contain information on landfill gas.

International reporting

The Czech Republic replies partly to the joint OECD/Eurostat questionnaire. The Vak 2002 census will provide the required data for Table 5c "Treatment and disposal of municipal waste". From 2003, the old questionnaire on municipal waste will be expanded as another step towards full compliance with the joint questionnaire.

The EU Directive 91/692/EEC obliges all EU members to report regularly on the implementation of major waste directives in three-year periods. The Ministry of the Environment is preparing quality objectives and a quality management system that would meet the requirements of the EU reporting system.

The Czech Republic reports on import and export of waste according to the obligations of the Basel Convention.

Selection of documents

- Act on Waste and amendment of some other Acts of 15 May 2001.
- 'Czech Republic 2000 - Ten years on: Environment and quality of life', Charles University Environment Center, Prague, 2000.
- 'State environmental policy', Ministry of the Environment of the Czech Republic, Prague, 1999 (There is a new version for 2001, probably on the web site www.env.cz).
- 'Report on the environment in the Czech Republic in 1998', Ministry of the Environment of the Czech Republic, Prague, 1999.
- 'Selected information about the environment in the Czech Republic (1994-99)', Czech Statistical Office, Prague, 2000.
- 'Generation, treatment methods, utilisation and disposal of waste in 2000', Czech Statistical Office, Prague, 2001.
- 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, 2001.

Institutions and contacts

Institution	Contact
Czech Statistical Office	www.czso.cz
Council of the Government-Central database of environmental projects	www.vlado.cz
Ministry of the Environment	www.env.cz
Charles University Environment Center	www.czp.cuni.cz

Hungary

Basic information waste management

In 1998, Hungary had to deal with 78.9 million tons of waste. Only 6% of that amount was classified as municipal waste, another 5% as hazardous waste.

In 2001, Hungary had 728 registered sanitary landfills, of which one was for hazardous waste [1]. A great number of low capacity local landfills do not conform with EC regulations, and there are around 2000 illegal ones [2]. The country has at its disposal 53 incinerators, of which one used exclusively for municipal waste. Some 81% of them comply with EU regulations [3]. Waste disposal facilities at municipal level and for hazardous waste have to be extended.

In 1998 non-hazardous industrial waste amounted to 10 million tonnes. The most important waste-producing branches were electricity, gas, steam and water supply, metallurgy, and the manufacture of foodstuff and beverages.

In the same year, 3.9 million tonnes of hazardous waste were generated in Hungary. Some 44% of that amount consisted of solid residues of power plants, 21% was red mud and 9.3% was of plant and animal origin, the greatest part of which came from livestock husbandry and slaughterhouses. Lead batteries are collected separately. Every year 18000 tonnes are exported to Slovenia for recycling.

In 1999, Hungary had to deal with 19 million m^3 of solid municipal waste plus 6.2 million m^3 of liquid municipal waste [4]. Some 83% of all dwellings were connected to regular waste removal. In 1990, the connection ratio was only 65%.

In Budapest, municipal solid waste was composed of 30.7% biodegradable organic matter, 20.2% paper, 12.3% plastic, 5.1 % textiles, 4.3% glass, 3.1% metal, 3% plastic with paper content, 0.6% hazardous waste and 20.7% others. Some 47% of that waste was potential secondary raw material and 68% of the materials found was inflammable.

Packaging waste is collected by a consortium of communal service enterprises. This activity is financed from product charges and occasionally from the Environmental Protection Fund. A deposit refund scheme covers some alcoholic drink bottles plus glass and PET bottles for soft drinks.

Waste management planning and strategy

Waste management strategy

The principles of waste management are fixed in the Act XLIII on Waste Management. Some important goals are the prevention of waste generation, the utilisation of renewable resources, the design of reusable products, the production of goods with a long life cycle, the reduction of quantity and hazardous nature of waste, waste recovery, and the disposal of non-reusable and non-recyclable waste in an environmentally sound way. The act approves the principles of integrated pollution prevention, precaution and manufacturer's responsibility.

According to the act the manufacturer will have to take back specified used items. He has the duty to indicate low-waste technology, long-lasting or reusable nature on a product. The government will regulate (or has already regulated?) rates of return in a decree. The dealer must ensure the return and separate collection of specified goods. The consumer is obliged to use waste gathering systems and to return specified used products to the dealer in charge. There are product charges for accumulators, packaging materials, tyres, refrigerators and refrigerants. Although the revenue goes to the central budget, it is earmarked.

Hazardous waste generated in households shall be collected separately at the expense of the producer. All waste gathering activities and disposal installations are subject to permits issued by the environmental authority.

A separate legal rule will fix (or has already fixed) which wastes must not be disposed of in landfills. Until 2003, all landfills are planned to be inspected. The content of biodegradable organic material in waste disposed of in landfills shall be reduced to 75% by 1 July 2004 and to 35% by 1 July 2014.

Waste may be imported for recovery only. Hungary wants to achieve self-sufficiency, which means the disposal of all the generated waste at the national level.

Expenditure

In 1999, industry spent HUF 4 billion on waste treatment, of which 61% was on the treatment of hazardous waste [5]. During the same period, the State had a revenue of HUF 55 million from hazardous waste fines plus HUF 2.6 billion from product fees of packaging material [6]. Product fees are also imposed on tyres, refrigerators and accumulators.

The collection and disposal of municipal solid and liquid waste cost HUF 20 billion, which is equivalent to HUF 2000 per capita. Charges for municipal waste are set by municipalities. Their objective is cost recovery. The revenue goes to waste collection companies. Generators of hazardous waste have to pay a non-compliance fee, the amount of which depends on the waste's quantity and character. The revenue is earmarked for the environment.

Legal and institutional framework

Legislation

The Act XLIII on Waste Management has been in force since 1 January 2001. It implements legislation harmonised with EC regulations in the following areas: public service providers and contracts for waste management, calculation of fees for municipal waste, categories of waste and hazardous waste treatment. Full transposition has also been achieved in relation to disposal of waste oils and PCB/PCT, treatment and agricultural use of

(1) 'Waste management policies in central and east European countries: Current policies and trends', DHV CR Ltd, Prague, 2001.
(2) '2001 regular report on Hungary's progress towards accession', European Commission, Brussels, 2001.
(3) 'The challenge of environmental financing in the candidate countries', European Commission, Brussels, 2001.
(4) 'Environmental statistical data of Hungary 1999', Hungarian Central Statistical Office, Budapest, 2000.
(5) 'Environmental protection expenditure by industry 1999', Hungarian Central Statistical Office, Budapest, 2000.
(6) 'Environmental statistical data of Hungary 1999', Hungarian Central Statistical Office, Budapest, 2000.

sewage sludge, and the handling of batteries and accumulators. A ministerial decree on the list of wastes was issued, which entered into force in January 2002. In October 2001, Hungarian legislation was aligned with the EC landfill directive.

Further steps towards EC legislation are needed in the fields of packaging waste and of waste transport across the EC borders.

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 National Public Health and Medical Officer's Service deals with public health issues related to waste. The Hungarian Central Statistical Office carries out surveys on municipal waste and environmental expenditures.

The 12 regional environmental inspectorates (REI) issue permits for the handling of hazardous waste and collect data on the management of hazardous waste and non-hazardous industrial waste. Another important task is the monitoring of waste disposal sites. The REI's have their own laboratories, which are all accredited. They have the power to impose fines and close facilities. Their inspections take place at an appropriate level: inspectors do not hesitate to make surprise visits; simple "walk through" inspections are not usual.

Municipalities (under the control of the Interior Ministry) are responsible for household waste management, including the implementation of the landfill directive.

Several training programmes have been launched for local government and environmental authorities to facilitate the implementation of the new Act on Waste Management. The number of staff at the Ministry for Environment and at the 12 Regional Environmental Inspectorates dealing with waste management issues has been increased and is considered as sufficient.

Legal waste information requests

The Act XLIII on Waste Management obliges Parliament to set up a national waste treatment plan until July 2001. In May 2002, the Regional Waste Treatment Plans have to be elaborated with involvement of civil environmental protection organisations. Some 270 days later, local waste management plans will have to be adopted.

Producers of hazardous waste have to draw up a waste management plan for a period of at least three years. According to Article 36 (2) of the Act on Waste Management, some economic organisations are obliged to set up a waste management plan. The Waste Act states that they shall be defined in a separate legal rule.

Waste information collection

The Central Statistical Office carries out regular surveys on municipal waste. It commissions the regional statistical offices to send a questionnaire to all the municipalities and the enterprises dealing with municipal waste collection and treatment. For example, the municipalities are asked about the number of residential buildings and holiday homes connected to regular waste removal and the amounts of waste collected separately, recycled, composted, incinerated with energy recovery, and landfilled. Data about the composition of municipal waste are demanded, too. The questionnaire also includes also a part about landfill sites: their capacities and annual input, the existence of weight bridges, the volume of generated biogas, the protection system, the volume of collected and treated drained water and the applied recovery operations are some of the collected data.

The Ministry of the Environment collects data on hazardous waste in cooperation with the Institute for Environmental Management and the 12 regional environmental inspectorates. It reports to the Basel Secretariat on import and export of hazardous waste.

Two surveys are carried out annually, another one quarterly. They partly use the European waste catalogue. For the yearly surveys, all public and private enterprises (including health institutes) generating hazardous waste have to reply. Organisations taking over hazardous waste are the subject of the quarterly surveys.

The Ministry for Economic Affairs collects information about non-hazardous industrial waste once a year. Designated enterprises of production, research and development have to reply to the questionnaire. The European Waste Catalogue is partly used. Several questions of the OECD/Eurostat questionnaire are covered.

The regional environmental inspectorates feed the results of their monitoring activity into regional registers which provide the basis for the national environmental protection information system. They also compile data on the number of licenses issued, and report on implementation and legislation problems.

A computerised register of authorisations concerning waste management was set up under the municipal solid waste programme.

A Phare project with Flanders was carried out on environmental monitoring in the context of the transposition of the Council Directive 75/442/EEC. It had the two main goals: the establishment of a EU-conforming waste management information flow and the elaboration of precise guidelines for the regional waste management plans. It will create a database on waste production. Some 143 Hungarians will be trained to work with the new information system so that the supply of statistical data will be improved. Another 87 people will be trained on waste management planning.

International reporting

Hungary reports its imports and exports of hazardous waste to the Secretariat of the Basel Convention.

Since 1995, Hungary has replied to the OECD/Eurostat joint questionnaire on waste.

In order to prepare for the implementation of the coming "European Parliament and Council regulation on waste statistics", the Ministry of the Environment is involved in a Phare project.

Selection of documents

- 'Environmental statistical data of Hungary 1999', Hungarian Central Statistical Office, Budapest, 2000.
- Public utilities 1999', Hungarian Central Statistical Office, Budapest, 2000.

- 'Environmental protection expenditure by industry 1999', Hungarian Central Statistical Office, Budapest, 2001.
- Act XLIII on Waste Management, 2000.
- '2001 regular report on Hungary's progress towards accession', European Commission, Brussels, 2001.
- 'The challenge of environmental financing in the candidate countries', Brussels, European Commission, 2001.
- Questionnaire on municipal waste removal, 2001.
- 'Waste management policies in central and east European countries: Current policies and trends', DHV CR Ltd, Prague, 2001.

Institutions and contacts

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

Estonia

Basic information waste management

In 2000, a total of 11.6 million tonnes of waste were generated in Estonia. Most of this waste - about 8.3 million tonnes - comes directly or indirectly from energy production (oil-shale burning ash, oil-shale mining waste). According to the European Environmental Agency Estonia is the biggest industrial and energy production waste producer per capita in Europe [(1)].

Regarding non-hazardous production waste in 2000, about 5.1 million tonnes (44 % of the total waste amount) were generated - mainly from industrial and agricultural companies. Among the waste sources oil-shale mining with oil-shale based energy production and chemical industry dominates as well as construction, wood processing and food industry [(2)].

Municipal waste includes waste from households, similar industrial and institutional waste as well as separately collected fractions [(3)]. In 2000, 69 % of the population was covered by waste collection [(4)]. Waste quantities are usually calculated from the volume of waste collected and delivered to landfill sites because landfills are not equipped with weighing bridges. The accuracy of figures on the volume of municipal waste is usually quite low. In the period 1993-97 amounts of municipal waste were increasing (from 337000 tonnes to 593000 tonnes), which can be explained with the appearance of new consumption habits as well as the introduction of several new package types and materials to the Estonian market. Since 1998 the generated waste amount has been declining (average for 1998 and 1999 563000 tonnes) [(5)]. This trend continued in 2000 with a total of 544000 tonnes of municipal waste resp. 378 kg per capita. Some 53 % of the municipal waste was received from enterprises, 46 % from households [(6)].

Municipal waste may contain components of non-hazardous waste and hazardous waste. Up to now there are relatively few data about the composition of municipal waste generated in Estonia. Despite this, the collection of hazardous waste generated by non-industrial sources, such as households, has already started. Appropriate hazardous waste collection and disposal systems are being developed.

A nation-wide system of waste sorting and separate collection has yet not been established in Estonia. In several cities, containers for separate waste collection have been made available to a limited extent. Packaging waste like glass bottles, paper, cardboard and plastics, are the main collected items. Since 1995 the collected amounts of wastepaper, glass and plastics have increased. Increasing amounts of wastes of ferrous metal and lead have been collected mainly for exports [(7)].

In Estonia, about 6 million tonnes of hazardous waste, around 4 tonnes per capita were generated in 2000 which is the highest amount per capita among European countries [(8)]. The main waste generators in Estonia are oil-shale mining, oil shale chemistry and energy industry. The amount of oil-shale treatment waste made up 5.9 million tons in 2000.

In the period 1993-2000 the amounts of hazardous waste decreased from 7.7 million tonnes to 5.966 million tonnes mainly due to the decrease of the production of oil-shale energy and shale oil. Other reason for the decrease are the restructuring of the economy and the accompanying decrease or alteration of production (including closure of production in several branches of industry) [(9)].

Regarding waste disposal the generated amounts of waste are commonly deposited in landfills. In 2000, 82 % of the total amount of waste was landfilled. There were 351 landfills in Estonia, 180 landfills were used for disposal of which 148 were landfills for mixed municipal waste, 22 industrial landfills and 10 animal tissue waste landfills. Waste is incinerated to a very limited extent. Some 164000 tonnes of waste were incinerated in 2000, of which 94 % with energy recovery. The wood waste made up the majority of incinerated waste while only 0.02 % of the collected municipal waste and 3 100 tonnes of hazardous waste were incinerated [(10)].

Waste management planning and strategy

Waste management strategy

The waste management strategy and implementation plan is included in the Estonian national environment strategy and the Estonian national environmental action plan. According to these documents the strategic goals of the waste management strategy should be achieved by:

1. support of sustainable use of raw materials;
2. prevention of waste generation, stimulation of recycling;
3. reduction of environmental damage caused by waste;
4. reduction of areas contaminated by waste and improvement of waste management as a whole (especially hazardous waste).

The priorities are: reduction of waste generation, promotion of recycling, use of biological processes (composting), and the environmentally friendly and safe disposal of waste. Quantitative targets are set for the year 2010. The following objectives can be considered as the key ones:

- improve disposal methods and the use of oil-shale processing waste;
- further increase the share of recycling;
- stabilise municipal waste generation (250-300 kg per year and capita);
- optimise the number of municipal landfills;

(1) Environment in the European Union at the turn of the century, European Environment Agency, 1999.
(2) State of the Environment on the threshold of XXI century, Estonian Environment Information Centre, Tallinn, 2001.
(3) Defined by a regulation of the Government of Estonia of 24 November 1998, No 263, Approval of the lists of waste categories, waste types and hazardous waste (the list is based on the European waste catalogue - EWC).
(4) Environment 2000, Statistical Office of Estonia, 2001.
(5) 'Second Baltic state of the environment report based on environmental factors', Baltic Environmental Forum, Riga, November 2000.
(6) State of the Environment on the threshold of XXI century, Estonian Environment Information Centre, Tallinn, 2001.
(7) Environment 2000, Statistical Office of Estonia, 2001.
(8) Environment 2000, Statistical Office of Estonia, 2001.
(9) 'Second Baltic state of the environment report based on environmental factors', Baltic Environmental Forum, Riga, November 2000.
(10) Environment 2000, Statistical Office of Estonia, 2001.

- treat waste according to accepted environmental and health standards;
- increase coverage of waste management services (in all areas of the country).

In the medium term the signing of voluntary agreements in the area of waste management (specification of waste volume to be recycled) is planned between the Ministry of the Environment, the Association of Enterprises and large companies. For the year 2000 the establishment of a competent authority and a relevant local co-ordination centre within the programme implementing the Basel Convention was planned, in order to comply with requirements of the Convention (1).

According to waste management legislation, sub-national waste management plans should be adopted according to following schemes:

- regional waste management plans one year after the adoption of the national waste management plan (revised every five years);
- municipal waste management plans as a part of the overall management plan (taking into account the regional waste management plan).

Several regions have already completed their waste management plans but only one of them has legal status and is available to the public.

Expenditure

With regard to investment, the total volume of finances going into waste management was EEK 95.4 million (EUR 2.7 million) in 1998 and EEK 52.2 (EUR 1.5 million) in 1999. Estimation of total investment into the waste sector is not available yet. Preliminary data, however, indicates that expenditures connected with the closure of old landfills and the construction of new ones will make up the largest share of the total figures. In total the EU approximation costs in the waste management sector are estimated to amount to EUR 485 per capita (2).

Since 1990, taxes for waste disposal in landfills have been set in Estonia. The landfill tax is one of the pollution taxes, which forms a specific part of the State budget for environmental needs. It is approved by parliamentary acts. The charge increases annually depending on the inflation rate. In 1999, the charge for non-hazardous waste was EURO 0.10 per tonne. Until 1999, all income generated by landfill taxes went through the State budget to the Environmental Fund.

A fee for waste disposal - money charged from anyone who deposits waste in landfills - may be set by the management authority of each landfill. It includes landfill tax, landfill operation costs, VAT and profit. In 1999, it was EUR 9.78 per tonne (capital city).

A fee for waste management service is charged from waste generators (citizens, offices, shops, restaurants, etc.) for waste collection, recycling, re-use or deposition. This fee is agreed upon by the waste collection/management company and the relevant waste producer. The average fee for public waste management service was EUR 63.90 per person per tonne and 15.33 per person per year (1999) (3).

In the case of batteries there is a payment for collected car batteries, paid by a waste management company, and there is a similar situation with metal scrap where the recycling companies pay for collected scrap metal. There is a tax/charge on packaging waste, paid by users and importers of packaging, the excise is paid for each unit and volume of the packaging of alcoholic (1997) and non-alcoholic (1999) beverages, 50 % of the revenue goes into the central budget, 50 % is used for the financing of collection and disposal systems of packaging waste. This product tax/charge is not paid for packaging whose recycling rate is over 60 % (4).

Legal and institutional framework

Legislation

The area of waste is regulated by the:

- Waste Act (WA) entered into force 1 December 1998;
- regulation pursuant to the provisions of subsection (1) of Section 45 of the "Waste Act" (draft);
- Pollution Charge Act (PCA) entered into force 21 March 1999;
- Environmental Supervision Act (RT I 1997, 86, 1460; 1999, 54, 583);
- Approval of the lists of waste categories, waste types and hazardous waste: regulation of the Government of Estonia of 24 November 1998, No 263, entered into force on 1 December 1998;
- Packaging Act (adopted 1995);
- Databases Act (DA) passed on 12 March 1997;
- Act on Environmental Register (approved 2001);
- Official Statistics Act passed on 11 June 1997;
- statistical programme elaborated annually by Statistical Office of Estonia (SO-Estonia) and adopted by the government.

Alignment with the EC environmental acquis is well advanced in Estonia. The country has adopted almost all framework laws that are generally in line with the EU requirements (5). However, administrative capacity and enforcement of all environmental legislation still need to be improved and the implementation of the acquis should be accelerated in the areas of:

- waste (particularly the landfill of waste);
- strengthening of administrative capacity needs at local level in smaller municipalities;
- ensuring considerable investments for the implementation of the environmental acquis.

(1) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(2) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(3) 'Second Baltic state of the environment report based on environmental factors', Baltic Environmental Forum, Riga, November 2000.
(4) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(5) '2001 regular report on Estonia's progress towards accession', European Commission, November 2001.

Therefore, the legislation currently under preparation mainly focuses on the transposition of EU directives. The specific legislative instruments in force include: the separate treatment of hazardous waste, prohibition of the production, import, export, sale and use of some types of batteries (listed in the legislation), the treatment of some types of metal scrap (list of metal wastes to be considered as hazardous), requirements on the collection and disposal of waste oils, requirements regarding packaging, PCBs/PCTs, sewage sludge and radioactive waste.

Institutional framework

The Ministry of the Environment (MoE) is responsible for the elaboration and implementation of the Estonian environmental policy, including waste management policy. Furthermore, it is the chief processor of the central State register of waste (1).

At the central level, the MoE shares its responsibility with the Ministry of Economic Affairs (MoEA) with regard to packaging and packaging waste.

The County (Regional) Environmental Authorities (CAE) are subdivisions of the Ministry of the Environment. They issue waste permits, kee county subregisters of the State register of waste and check the reliability of waste data in reports delivered to them by enterprises - waste handlers and waste generators (producers) - before delivering the data to EEIC.

The Estonian Environmental Inspectorate (EEI) is the State environmental supervision authority having a central organisation and eight departments in the counties. EEI is responsible for supervising the implementation of legal acts and regulations in the whole environmental area. Concerning waste the EEI is required to supervise the compliance with waste handling conditions established in permits at least once a year (2).

The Estonian Environmental Information Centre (EEIC) is subordinated to the ministry of the Environment. It is authorised by the Ministry , responsible for the collection and processing of environmental data and keeping databases on waste, air pollution as well as water use and pollution. EEIC is the national focal point of the European Environmental Agency (EEA). With enforcement of the Act on Environmental Register the Estonian environmental register (including a waste register) will be established at the EEIC.

The Statistical Office of Estonia (SO-Estonia) carries out a survey on environmental protection expenditures and has developed together with the MoE and the EEIC a questionnaire on waste management (Jäätmekäitlus). This questionnaire is utilised by the county environmental authorities for data collection.

Structural changes in the Ministry of the Environment (MoE) and its administrative field have improved the administrative capacity. In 2000, both the MoE as well as public authorities under its subordination have been reorganised. New structural units dealing with integrated pollution prevention and control and new technologies, as well as environmental investments and strategy and planning have been established. The management of environmental monitoring is under reorganisation.

Since the beginning of 2000, county environmental departments have been brought under the administrative field of the MoE and reorganised into regional departments under the MoE. This will facilitate better implementation and enforcement of environmental requirements.

Legal waste information requests

Waste information (data) is the basis for establishing waste management plans. Chapter 3 of the Waste Act (WA) specifies the rules for waste management especially for the establishment of waste management plans. Waste management plans have to be elaborated on three regional levels: national, county and city or rural/municipality-level. These plans have to be established firstly at least two years after the Waste Act came into force, i.e. for December 2000.

Chapter 5 of the WA specifies the rules for hazardous waste. Article 28 determines the transboundary movements of waste. Transboundary movement of waste shall be compatible with international agreements binding to the Republic of Estonia and pursuant to Estonian law. The import, export and transit within the Estonian territory shall be carried out on the basis of permits issued by the MoE to prevent illegal transboundary movement of waste.

According to Chapter 6 of the WA on permits and licences, permits are required for disposal, recovery, collection and transport of hazardous waste and also for transport service of non-hazardous waste (Section 30(3)1-3). In addition, permits are requested for producers belonging to 10 branches with environmentally relevant wastes (3).

Chapter 7 of the WA determines the topics record-keeping, reporting and databases. All persons possessing a permit, registered in the waste register or producing hazardous waste (except households) have to report at least once a year on waste-related activities to the environmental authority. They are required to keep records of the type, quantity, properties and generation of waste produced, collected, stored or temporarily stored, transported, recovered or disposed of in their activities. If waste is transferred to handlers, records shall also be kept on the destination, frequency of collection, means of transport and recovery and disposal procedures of the waste. The basic documents and consolidated data of the records shall be stored at least for five years (Sections 44 and 45).

Article 46 regulates the State register of waste where information concerning the type, quantity and origin of waste generated and managed in Estonia, persons operating in the area of waste handling, waste management facilities intended for waste disposal, waste permits and hazardous waste handling licences and transboundary movements are compiled. The State register of waste consists of the central register, the chief processor of which is the MoE, and county subregisters which are administered by environmental authorities.

Municipal waste management is fixed in Sections 14 and 15 of the WA. Local government has to administer municipal waste

(1) The State register of waste (Section 46 of the Waste Act) is a database containing information on waste generated and managed, persons operating (permits and licenses), waste management facilities and transboundary movements of waste.
(2) According to Section 47 of the Waste Act - rural municipalities and city governments also have to supervised.
(3) These branches are: (1) energy and fuel processing industry, (2) metal-production and -processing, (3) mineral materials-production and processing, (4) chemical industry, (5) timber, pulp and paper industry, (6) animal husbandry and food industry, (7) mining and enrichment of mineral resources, (8) tanning and processing of leather ,leather, textiles and fibre, (9) surface treatment and finishing by using organic solvents, (10) storage of hazardous chemical, including fuel.

transport in its territory except if it is too expensive [1] or if there is no need from the environmental or health protection viewpoint. Holders of municipal waste have to subscribe to organised municipal waste transport except when the government gives permission to organise it by themselves.

Municipal waste management is organised in Estonia in a quite complex manner. From the statistical point of view difficulties can arise with relation to waste generation of municipal waste and also with relation to waste collection, because in some cases waste holders can deliver waste to landfills by themselves. However, data for these areas where there is no organised waste collection can be derived certainly from landfills because they have waste permits and accordingly reporting obligations. Waste holders can deliver according to law their waste only to persons who have waste permits and are therefore obliged to report. So, theoretically such waste amounts must be in any case considered by a waste survey from 'acceptor' side.

Waste information collection

One survey on waste management (Jäätmekäitlus) has been carried out up to now in Estonia. The questionnaire for this survey has been developed in the Statistical Office in co-operation with MoE and EEIC and the distribution to the enterprises is under responsibility of the regional environmental authorities. The survey has been carried out annually since 1992. The questionnaires are sent out in the beginning of January and the answers are received in February. The results of the survey are compiled in EEIC and approved by the Ministry of the Environment. The final results are submitted to the Statistical Office of Estonia including individual data. Data are available for 2000 with an EWC breakdown.

Since December 1998 a new classification system for the surveys on waste management has been used which is harmonised with EU classification. Before 1998, surveys were conducted on the base of a national classification of waste which was considerably different from the classification actually in use.

In January 2002 a regulation pursuant to the provisions of subsection (1) of Article 45 of the Waste Act entered into force which regulates the waste report. The waste report is a document which contains data on waste-based activities of a person (reporter) specified in Article 44, subsection 2, of the Waste Act.

The waste report form includes four tables:

1. Categories and amounts of waste generated and handled;
2. Waste deposition and direct release of waste into environment;
3. Waste received from other persons or households, incl. imported waste;
4. Waste delivered to other persons or households, incl. exported waste.

The waste report has to be filled in by persons specified in Article 30, subsections 3, 5 and 7 of the Waste Act. These are entrepreneurs who have been granted a waste permit, persons to whom the waste permit requirement does not extend but who are engaged with recovery or disposal of non-hazardous waste in a point of generation, persons organising disposal or recovery of waste in the name of someone else (intermediaries) and being registered as well as producers of hazardous waste, excluding households.

The waste report should describe the waste-related activities of the reporter during the last calendar year. In addition, environmental service may require submission of a report once a quarter for ensuring the calculations of pollution charge according to Article 11, subsection 4, of Pollution Charge Act.

International reporting

Estonia reports and replies on:

- the Secretariat of the Basel Convention its imports and exports of hazardous waste since 1992;
- the OECD/Eurostat questionnaire since reporting year 1995. The last available data are from 1999;
- the regional environment questionnaire - Eurostat questionnaire;
- the Baltic Environmental Forum (BEF) for the Baltic state of the environment report;
- the European information and observation network, EIONET for the state of the environment report (SoER);
- the Dobriš+3 report (European state of the environment report).

Selection of documents

- Environment 1999, Statistical Office of Estonia.
- Environment 2000, Statistical Office of Estonia.
- Environmental protection expenditures, 1999, Statistical Office of Estonia.
- 'Second Baltic state of the environment report based on environmental indicators', Baltic Environmental Forum, Riga, 2000, (www.bef.lv).
- State of the environment in Estonia on the threshold of XXI century, Estonian Environmental Information Centre, 2000, (www.envir.ee/itk/eng/index.html).
- 'European integration', Ministry of the Environment, 5.2.2001, (www.envir.ee/eng/eurointegration.html).
- 'Accession to the EU', Ministry of the Environment, (www.envir.ee/eng/accession.html).
- '2001 regular report on Estonia's progress towards accession, European Commission, November 2001, (http://europa.eu.int/comm/enlargement/report2001/ee_en.pdf).
- 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
- 'Information collection in Phare countries on waste and on environment expenditure - State-of-the-art reports', Working Paper No 1/2002/F3, European Commission, 2002.

Questionnaires:

- Waste Management (Jäätmekäitlus);
- waste report.

(1) This is only the case for a small number of disproportionate location of waste generators

Institutions and contacts

Institution	Contact
Statistical Office of the Estonian Republic	www.stat.ee/
Ministry of the Environment	www.envir.ee/eng/index.html
Estonian Environmental Information Centre	www.envir.ee/itk/eng/index.html
Baltic Environmental Forum	www.bef.lv

Latvia

Basic information - waste management

According to official sources the amount of municipal waste in Latvia was about 600000 tonnes in 2000, of which about two thirds was residential waste and one third was produced by institutions and enterprises (1). Other sources assume for the same year a total of non-hazardous waste of nearly 1 million tons consisting of about 775000 tonnes household and commercial waste, 61000 tonnes green waste, 70000 tonnes demolition waste, 15000 tonnes healthcare waste and 73000 tonnes industrial waste (2).

On average, waste collection services are available to only about 60% of residents, and as a result waste is dumped in forests, along roadsides, beside water bodies and other illegal sites. The way in which municipal solid waste is stored and collected in Latvia varies considerably, depending on the location. In the large cities and towns, the waste management system is more organised, most typically consisting of centrally located containers in residential and commercial areas, in which waste is deposited and collected. In the medium-sized villages and towns, services are provided at least once a week. In more rural areas, collection is much more infrequent. Municipal solid waste collection is mainly carried out by waste collection enterprises, only a small proportion of which are private companies, typically those dealing with waste in the larger urban centres.

Most of the municipal solid waste and other collected wastes are deposited without pre-treatment at one of the numerous dumpsites, which are very varied in size, across Latvia. In 2001 about 250 dumps were permitted to operate (3) and accept waste. Approximately 40% of the waste collected is disposed of at the Riga (Getlini) landfill. Waste registration takes place only at landfills used by the biggest cities. Usually only volume units (m^3) are used for waste registration.

Regarding packaging and packaging waste Latvia has a collection system based on an agreement signed between the Ministry for Environmental Protection and Regional Development (MEPRD) and voluntary associations of companies that produce or use packaging. The collection system is organised and financed by a producer responsibility organisation (PRO) - Green Dot Latvia which to date accounts for 10% of all packaging waste.

According to the Packaging Institute of Latvia, approximately 128742 tonnes of packaging waste (glass, plastics, wood, metals, paper and cardboard) were produced in 2000. Most of this waste was disposed of in landfills or dumpsites as a constituent of MSW and similar commercial/industrial solid wastes. At present the capacity for recycling, reuse and recovery of packaging in Latvia is very limited. Some facilities exist for metals, glass, paper, cardboard, and PE recycling, but these are not currently operating at full capacity or on any significant scale.

The total amount of generated hazardous waste in 2000 was 93000 tonnes, of which 53000 tonnes were sediments from metal tempering processes and 27000 tonnes were industrial waste water treatment sludge. About 13000 tonnes of waste containing oil and oil products were produced by oil storage sites, petrol fuel stations, transport and vehicle service enterprises. In 2000, a fairly precise inventory was made of infectious waste (127 tonnes produced) associated with human and animal health care and research. The produced amount of hazardous waste has decreased by 2.7 times, in comparison to that in 1990 (4).

The amount of spent batteries for the year 1998 was estimated to 500 tonnes, although it is widely assumed that this figure is under-estimated due to the illegal import of batteries. They are mainly disposed of as a constituent of municipal solid waste in landfills. Used car accumulators are being collected by a number of companies, who also dismantle them and export them to processing facilities overseas. Total accumulator waste generated in 1999 was estimated to be at least 4200 tonnes. The tonnage in subsequent years is likely to be closer to 300 tonnes annually, as old accumulators waiting for collection are gradually removed.

Regarding end-of-life vehicles, around 90000 vehicles are deregistered each year. These are currently processed for the recovery of spare parts and recyclable scrap metals for export, generally in unlicensed and poorly managed facilities. Used tyres are mostly landfilled although some are accumulated/stored and used for energy recovery in cement kilns.

The quantities of waste oil products entering the territory of Latvia are to a large extent carried via water in the coastal regions. One facility treats up to 1 million m^3 of water contaminated with oil each year, approximately half of which is ballast from vessels in the harbour, and the other half arises from various local industries, significantly the oil industry. Some of the sludge arising from the water treatment is processed and used as fuel by a facility in Riga producing building products, and some is exported to Estonia for combustion.

There are no real resources in Latvia for the treatment of used engine oils and their components. Most of the oily car components are currently landfilled. The majority of waste oil and oil emulsion arising from enterprises and activities in-land is currently burnt. In addition, waste oils routinely arise from oil spillages from the railways. The waste oil that is collected from this source tends to be burnt as fuel. No system exists for the removal of oil-contaminated soil in relation to these spillages

Regarding PCB waste it is estimated that around 100 tonnes exists in capacitors used in the energy supply system. Some of this waste has already been exported and disposed of in the Netherlands; the remainder is awaiting export for treatment/destruction. Alternatively, it may be disposed of in the planned semi-mobile hazardous waste incinerator.

Healthcare waste is usually disposed of at MSW landfills or dumpsites and about 20% is incinerated. These proportions mainly refer to hospital wastes - healthcare wastes from other facilities such as dentists, medical centres etc are generally landfilled. Generally the level of separation of hazardous and non-hazardous waste is low.

(1) Environmental indicators in Latvia 2002, Latvian Environment Agency, Riga, 2002.
(2) 'Multi-year waste management plan for Latvia', final report, regional environment accession project, October 2001.
(3) Addendum to position paper of the Republic of Latvia, draft, April 2001, p. 2.
(4) Environmental indicators in Latvia 2002, Latvian Environment Agency, Riga, 2002.

The quantities of other potentially hazardous wastes presently generated are believed to be fairly small, probably originating from the airport and some industrial premises. These take the form of sludges containing heavy metals, solvents and other chemicals. The current fate of these wastes is unknown.

Presently landfill sites for the disposal of hazardous waste are lacking and facilities for reprocessing or treatment are limited. Therefore, hazardous waste which cannot be reprocessed must be stored in the territory of enterprises. As a result, about 1 500000 tonnes of hazardous waste which require reprocessing or treatment have now been accumulated in enterprise territories.

The Latvian Government intends to establish a semi-mobile incineration unit for the high-temperature incineration of combustible hazardous wastes, which shall be in operation in 2002. Furthermore, the construction of a physico-chemical treatment and stabilisation facility (to be established within the next three years) and a landfill site for the disposal of certain hazardous wastes is planned. The first stage of the landfill is expected to be in operation in 2004, and the second stage after 6 to 7 years. Its total capacity per annum is planned to be up to 40000 tonnes.

Waste management planning and strategy

Waste management strategy

The national waste management strategy of Latvia is outlined in the national strategy for the management of municipal waste, 1998-2010 and in the national hazardous waste management strategy, 1999-2004. For complementing and building upon these documents a (draft) multi-year waste management plan for the years 2003 to 2015 was elaborated in 2001 (1). Its overall purpose is to provide a policy and decision-making framework for the future management of wastes in compliance with EC laws. According to this document a national waste management plan will be prepared and formally be adopted by the end of 2002. The waste management plan has to be complemented by detailed implementation plans for each main element of the plan.

Prior to, and following the formal adoption of a national waste management plan in 2002, it is intended to review both the national municipal waste management strategy 1998-2010, and the national hazardous waste management strategy 1999-2004. The aim of the review will be to re-appraise, revise and update the proposed actions in the light of the national plan, the EU legislative requirements, the existing and emerging national legislation, and the evolving waste management situation in Latvia. Both revised strategies will be used, alongside the National Plan, as a basis from which to prepare detailed implementation and financing plans for specific projects and for specific EC directives.

The strategic objectives defined in the (draft) multi-year waste management plan reflect the government's commitment to

- tackling the increasing amounts of waste produced, by endeavouring to weaken and eventually break the link between economic growth and waste production;
- increasing recovery of waste to the extent feasible;
- establishing an integrated waste management system, taking account of the best available technology/techniques not involving excessive costs;
- ensuring that waste is recovered or disposed of without endangering human health and without using processes or methods that could harm the environment.

The numerous strategic objectives for waste management outlined in the (draft) multi-year waste management plan are affecting the areas or activities: policy/legislative framework, institutional/organisational arrangements, data availability and reporting, waste avoidance and reduction, waste recovery and recycling, waste treatment and processing as well as final disposal. In addition to the strategic objectives, targets for specific wastes/waste streams like municipal solid waste, biodegradable waste going to landfills, packaging waste, batteries and accumulators, PCB/PCT waste as well as end-of-life vehicles were set.

Expenditure

In total, the EU approximation costs for the waste management sector (investment costs) are estimated to amount to EUR 105-140 per inhabitant. According to the (draft) multi-year management plan the projected capital expenditures for waste management from 2001 to 2020 are estimated to range between 383 and 744 million EUR (between EUR 160 to 310 per inhabitant (2).

The financing of municipal solid waste management in Latvia comes from three sources: the user fees paid by inhabitants for waste collection services, funds from the natural resource tax (LVL 25/m^3 for waste disposal, 60 % of which goes to municipalities) and the general municipal budget. In general, the revenue gained from these sources is not sufficient to cover the costs of operating the services. This is because the waste tariffs paid by inhabitants are usually very low or the municipalities (especially in rural areas) do not charge for waste services and cover these expenses from their own budgets.

In addition, there is a product charge on batteries and accumulators with revenue earmarked for the Environmental Fund. A similar charge is used in the case of disposable containers and packaging, tyres, light bulbs and lubricants. Also waste non-compliance fees are applied for solid waste dumping. The revenue goes to the State Environmental Fund.

Legal and institutional framework

Legislation

The specific legislation on waste management, presently in force, includes (3):

- Law on Waste Management (the law was adopted in Parliament on 14 December 2000 and came into force on 1 March 2001);
- Regulations of the Cabinet of Ministers No 15 Regulations regarding requirements for construction of landfill sites, as

(1) 'Multi-year waste management plan for Latvia', final report, regional environment accession project, October 2001.
(2) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(3) See the following web site (http://www.varam.gov.lv/vide/likumd/Eatkrit.htm).

well as management, closure and recultivation of landfill sites and dumps (3.1.2002);

- Regulations of the Cabinet of Ministers No 529 on order of waste management for particular types of hazardous waste (18.12.2001);
- Regulations of the Cabinet of Ministers No 323 on requirements for incineration of waste and for operation of waste incineration plants (17.07.2001);
- Regulations of the Cabinet of Ministers No 258 on waste classification and characteristics which make waste hazardous;
- Draft regulations of the Council of Ministers (CoM) on transboundary movements of waste/on waste transboundary shipments;
- Regulations of the Cabinet of Ministers No 432 on issuing, prolonging and annulling of permits for waste management;
- Regulations of the Cabinet of Ministers No 191 on types of waste recovery and waste disposal;
- Regulations of the Cabinet of Ministers No 316 on use of effluent sludge in the fertilisation of soil in organising territorial public services/on use of sewage sludge in improvement of soils;
- Law on Packaging (adopted on 9.1.2002, enforcement from 1 July 2002);
- Law on Natural Resource Tax in force since 1 January 1996; amendments to the Law on Natural Resource Tax in force since 6 April 2000.

The Law on Waste Management 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 Council of Ministers (CoM) regulations on waste management. Work is already well advanced on the completion and enactment of CoM regulations to elaborate the Law on Waste Management. It is expected to complete most of this work by the end of 2002, although additional tasks related to the new directives are likely to go beyond this date. The adoption of the new Law also led to work to draw up a waste management plan in line with the provisions of the relevant directive.

Regarding waste classification Latvia adopted the European waste catalogue (EWC) classification for hazardous waste. The implementation of a national waste catalogue based on the EWC which shall include all waste types will be completed by 2003.

Institutional Framework

The Ministry for Environmental Protection and Regional Development (MEPRD) 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, UNO and other international organisations, and for the co-ordination of international co-operation on environmental matters. Furthermore, it has the overall authority for monitoring and reporting.

Beside the MEPRD the following ministries are involved in waste management: Ministry of Welfare (waste management in healthcare institutions), Ministry of Agriculture (veterinary waste management system), Ministry of Economy (financing of waste management projects), Ministry of Finance (State waste management budgeting, financing policy, financial management of the ISPA funds) and Ministry of Transport (end-of-life vehicles, registration and de-registration).

The Latvian Environment Agency (LEA) is a governmental institution subordinated to the MEPRD. The aim of LEA is to implement governmental policy in the area of environmental data and information compilation, processing and dissemination. LEA collaborates with different institutions - data and information stakeholders - to establish and develop the unified environment information system according to the legislation of the Republic of Latvia and the European Union. LEA operates as national focal point for the European Environment Agency and UNEP and is national co-ordinator 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 Latvian Environmental Protection Fund is responsible for managing, on behalf of the ministry, revenue gained from the natural resources tax. This fund is used to finance environmental projects, including waste management projects.

The regional environmental boards (eight in total) control waste management, through permitting, 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).

In order to implement the national waste management plan close co-operation and communication between the MEPRD, other Ministries, and Government institutions is required. Therefore, a standing Interministerial Steering Group has been created for co-ordinating strategy development and implementation within government, chaired by the MEPRD. Its primary purpose will be to co-ordinate the various actions required to implement the plan, monitor progress towards achieving the plan, and agree upon any changes or revisions to the plan.

Despite these efforts the government intends to strengthen the overall administrative capacity at national, regional and local level. Furthermore, the responsibilities of key institutions finally responsible for waste management at national, regional, and local level need to be clearly defined, rationalised and enforced if national and EU compliance in waste management is to be achieved in the minimum time, and sustained. This process should be completed by the end of 2003. Until 2004 responsibility for the planning of waste management systems will be transferred to the regional authority level, as part of the role definition and rationalisation process.

Legal waste information requests

In March 2001 a new Law on Waste Management (WML) entered into force, repealing the Law on Hazardous Waste from

1993 and the Law on Municipal Waste from 1998. Under the old legislation available data and information on the sources, nature, quantities and fate of wastes, and waste management facilities, were not sufficient to meet current or future EU and national requirements. With the new Law on Waste Management the basis for an effective monitoring, inspection and enforcement regime is provided, obligations on data recording and monitoring are established as well as responsibilities of authorities at national, regional and local level are defined.

The new law requires the formulation of a State waste management plan and the compilation of information regarding waste management. Responsible is the MEPRD or its authorised institutions (Section 8 WML). Which information should be included in waste management plans is defined in Section 10 (1). Inter alia the type of waste produced, collected, processed and buried, its composition, amount and origin have to be described.

Duties of holders, owners and persons who perform the management of waste are regulated in Chapter V, Section 20 (1) of the Law on Waste Management. It defines that persons engaged in waste management shall:

- record the amount (volume), type, origin, frequency of collection, transportation, type of recovery and disposal, and place of recovery and disposal regarding waste under management, and once per year submit the compiled information to the Ministry of Environmental Protection and Regional Development or its authorised institution, as well as to the relevant local government, and shall preserve such materials for three years;
- at their request, provide information to State authorities, local governments and the general public regarding waste management.

Regarding hazardous waste the Cabinet of Latvia has to determine the recording procedures for the recording, identification, storage, packing, labelling and transportation (Section 7, Clause 4 WML; Adoption and Approval by 1 January 2003). 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, packing, labelling and identification of hazardous waste (Section 14-(2) and (3) WML). Transboundary movement of waste is regulated in Chapter VII, Section 23 WML. According to paragraph 1 exportation of hazardous waste for recovery or disposal to States which have acceded to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal is permitted in compliance with the procedures prescribed in the convention.

Waste information collection

Presently in Latvia statistical surveys are carried out only on hazardous waste. There is no regular reporting system for municipal waste, mainly due to the fact, that collection of information in this domain is not obligatory.

The State statistical report on hazardous waste (Form 3-BA) is carried out annually. All hazardous waste producers have to fill out the reporting form. The amounts of waste generated per year and EWC code have to be declared. A breakdown by NACE branches and origin has to be done and finally the treatment has to be specified. These annual reports have to be submitted from waste producers to the regional environment boards which are responsible for data verification and approving. The verified data are further submitted to the State Environmental Inspectorate for a second verification and approval. Data processing then takes place at the Latvian Environment Agency. The data is finally approved in the ministry and at the end of the chain handed over to the Central Statistical Bureau of Latvia.

According to the (draft) multi-year waste management plan data and information about waste streams, e.g. quantities and types of hazardous wastes, are often insufficient and inadequate and an improvement of this situation is required to meet EU and national needs. In addition, a comprehensive system and procedures for classifying, processing, analysing and disseminating data and information on wastes and waste management activities in a consistent and standardised format is lacking. Therefore, the following key actions should be implemented until the end of 2003 [(1)]:

- impose a legal obligation on major waste producers to monitor and keep records of the quantities and types of waste generated using standardised procedures;
- introduce a legal obligation to install/operate weighbridges at all major waste management facilities;
- implement a national system and related procedures for classifying, collecting, processing, analysing and disseminating data and information on the sources, nature, quantities and fate of wastes, and waste management facilities;
- establish a national system and related procedures for monitoring and reporting of waste management activities and performance in a standardised format;
- conduct a study/investigation of the composition of MSW including commercial and institutional wastes;
- prepare a comprehensive inventory of PCB/PCT waste sources and quantities;
- prepare a comprehensive inventory of POPs and other dangerous chemical sources and quantities.

The Latvian Environmental Agency already started with the implementation of the above measures to bring the quality of data on waste in line with international/EEA standards.

International reporting

Latvia reports to and replies on:

- the Secretariat of the Basel Convention its imports and exports of hazardous waste since 1992;
- the OECD/Eurostat questionnaire (module 718) in 1998 and in 2000;
- the Baltic Environmental Forum (BEF) for the Baltic state of the environment report;
- the European information and observation network, EIONET for the state of the environment report (SoER);
- the European Environmental Agency (EEA).

(1) 'Multi-year waste management plan for Latvia', final report, regional environment accession project, October 2001.

Selection of documents

- Environmental indicators in Latvia 2002, Latvian Environment Agency, Riga, 2002, (http://www.vdc.lv/soe/2001_eng/par/par_1.htm).
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- 'Second Baltic state of the environment report based on environmental indicators', Baltic Environmental Forum, Riga, 2000, (www.bef.lv).
- 'Information collection in Phare countries on waste and on environment expenditure - State-of-the-art reports', Working Paper No 1/2002/F3, European Commission, 2002.
- 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.

Institutions and contacts

Institution	Contact
Ministry of Environmental Protection and Regional Development of the Republic of Latvia	http://www.varam.gov.lv/
Latvian Environment Agency	http://www.vdc.lv/eng/
Baltic Environmental Forum	www.bef.lv

Lithuania

Basic information waste management

In 1999, a total of 6340000 tonnes of waste [1] were generated in Lithuania, of which 6234000 tonnes (98 % of the total waste amount) were classified as non-hazardous waste including household or similar waste (1236000 tonnes), organic waste (i.e. animal or food waste, manure etc.-, 1719000 tonnes), secondary raw material (405000 tonnes) and other waste (2874000 tonnes). The amount of household and similar waste was declining between 1993 and 2000 by the factor 1.7 [2]. Due to a lack of weighing bridges usually the volume of the waste is usually evaluated visually and converted into tons using conversion factors that may cause considerable errors.

Regarding separate collection, a nationwide system of waste sorting and separate collection has yet not been established. In several cities, containers for separate waste collection have been made available to a limited extent. Packaging waste like glass bottles, paper, cardboard and plastic are the main collected items [3].

In 2000, Lithuania processed paper and cardboard waste (63600 tonnes), glass (49400 tonnes) and plastics waste (14200 tonnes). Some 81800 tonnes of wood waste were incinerated.

In the same year 29500 tonnes of paper and cardboard waste were imported into Lithuania, of which 27700 tonnes had been reprocessed. The amount of plastics waste imported totalled 11600 tonnes and 11500 tonnes were reprocessed. Furthermore, 296700 tonnes of scrap of ferrous metals were exported.

In 2000, 160000 tonnes of hazardous waste were generated. The amount of hazardous waste declined since 1993. Between 1994 and 1999 the amount ranged from 153000 tonnes in 1995 to 101000 tonnes in 1996. Up to 50 % of the total hazardous waste is generated by one oil refinery. With one or two companies generating such a significant share of certain waste streams, the sharp fluctuation in the waste amount from year to year is explainable by the amount of production and availability of internal or external recycling capacity.

About 48 % of hazardous waste was processed in 2000 including:

- oil sludge from Stock Company AB Mažeiki Naftali (46170 tonnes), which is centrifuged to separate oil;
- navigation bilge waters (24116 tonnes) - waters contaminated with oil are cleaned;
- ground contaminated with oil products (15498 tonnes) which was cleaned by applying biological treatment.

Some 49 % of hazardous waste was stored. Oil sludge (54946 tonnes) and soil contaminated with oil products (30271 tonnes) constitute the main quantity of hazardous waste stored. The remaining 3 % of hazardous waste were mostly incinerated or exported. Lead batteries amounting to 2034 tonnes constitute the main part among the exported goods.

Most of the generated waste is deposited without pre-treatment at one of the numerous landfill sites. The total number of landfills for municipal solid waste is 800 including contaminated sites and liquid waste reservoirs. About 85 landfills have a capacity over 25 tonnes per day. There is one landfill for the disposal of hazardous waste and a second under construction [4].

Waste management planning and strategy

Waste management strategy

The Lithuanian environmental protection strategy, the strategy for approximation in the environment sector and the national environmental monitoring programme are the main programmes formulating the basic principles of environmental protection:

1. ensuring a proper environment quality in Lithuania;
2. creating preconditions for sustainable development;
3. creating legal and institutional preconditions for EU membership in the environment sector;
4. ensuring the rational utilisation of natural resources and their further increase.

Regarding waste management a specific strategy is laid down in a document entitled, 'Outline of the national waste management strategy and the action programme', issued in 1999. In addition, goals and priority areas for waste management are defined in the strategy for approximation in the environment sector from 1998, in the national programme for the adoption of the acquis (NPAA) 2002/03, in the acquis implementation action plan (AIAP) for 2001 and 2002/03 as well as in the law approximation action plan (LAAP) for 2001 and 2002/03. In addition, the regulations on waste management, approved in 1999, regulate the implementation of waste management planning.

The waste management strategies set very detailed targets with timelines for each step, including, inter alia:

- to restructure the system used for the collection and processing of data on waste by 2001;
- to draft a national strategic waste management plan by the end of 2001;
- to draw up county and municipal waste management plans by the end of 2002;
- to collect 90 % of all municipal waste by 2005;
- to reduce the number of landfills to 30 by the year 2010;
- to design and construct a hazardous-waste incineration facility and a long-term safe landfill for hazardous waste, develop a system for the management of hazardous medicinal waste by 2004;
- to implement the programme for the processing of secondary raw materials (creation of a modern system for the sorting of secondary raw materials in conformity with the EU requirements, introduction and upgrading of technologies designed for the processing of secondary raw materials) by 2004.

(1) 'Natural resources and environment protection', Statistics Lithuania, Vilnius, 2000.
(2) 'Environment 2000 - Ministry of the Environment annual report', 2001.
(3) 'Second Baltic state of the environment report based on environmental factors', Baltic Environmental Forum, Riga, November 2000.
(4) 'Waste management policies in central and east European countries: Current policies and trends, final report, DHV CR Ltd, Prague, July 2001.

Other activities for waste management outlined in the documents mentioned above, inter alia, are affecting the areas: legislative framework, institutional/organisational arrangements, waste avoidance and reduction, waste recovery and recycling, waste treatment and processing, final disposal as well as specific wastes/waste streams like biodegradable waste going to landfills, batteries and accumulators, PCB/PCT waste, waste oils, waste from the titanium dioxide industry, end-of-life vehicles as well as the introduction of regional waste management systems for hazardous waste.

Expenditure

In total the EU approximation costs for the waste management sector (investment costs) are estimated to amount to EUR 89 - 100 per inhabitant (1). According to official Lithuanian sources the costs for the implementation of the Directive 1999/31/EC on the landfill of waste alone are estimated to require EUR 127 million. About EUR 10 million from public funds will be needed for the implementation of the Directive 94/62/EC on packaging and packaging waste (2). Meeting the negotiation obligations for the waste management sector, the official estimate of investments in the public sector by the year 2010 adds up to LTL 204 billion (3).

In Lithuania there are user charges on municipal waste, set by each municipality separately, which include hazardous and non-hazardous disposal charges. In capital cities a fee for waste deposition is charged which was EUR 4.65 per tonne in 1999. Landfill taxes are not raised. Furthermore, there is a product charge on batteries and accumulators, packaging and packaging waste and tyres.

Legal and institutional framework

Legislation

The specific legislation on waste management, presently in force, includes:

- the Law on Waste Management (1998, amended in 2000);
- waste management regulations (WMR) approved by the Minister of the Environment of the Republic of Lithuania by Decree No 217, 14 July 1999;
- government resolution on the outline of the national waste management strategy and action programme (1999);
- government resolution on the national programme for hazardous waste management and measures for the implementation thereof (1999);
- rules for the construction, operation, closure and after-care of landfills (adopted in 2000);
- draft regulation on transboundary movements of wastes (1999);
- orders of the Minister of the Environment on the approval of the fundamental requirements for the incineration of waste (1999);
- Law on Packaging and Packaging Waste (adopted September 2001).

Alignment with the EC environmental acquis regarding waste management is well advanced in Lithuania. The country has adopted almost all framework laws and directives that are generally in line with EU requirements. The government intends to complete the transposition of European law into national legislation by 31st December 2003, with the exception of those requirements where transition periods are valid (Directive 94/62/EC concerning packaging and packaging waste - transitional period until the end of 2006).

By the end of 2001, inter alia, the State strategic plan for waste management as well as the rules governing the collection and recycling of spent batteries and accumulators containing certain dangerous substances should have been set into force. The enforcement of the order on the rules governing the collection and management of waste oils will take place by the end of 2002. The adoption of the order on the procedure for the collection and disposal of polychlorinated biphenyls and polychlorinated terphenyls, the order on the requirements for the management of waste from the titanium dioxide industry as well as the order on the management of end-of life vehicles is envisaged for 2003.

Institutional Framework

The Ministry of the Environment (MoE) is the main institution responsible for environmental protection. Its main duties include development of legislation, environmental management, co-ordination of other institutions/stakeholders with role in implementing environmental legislation and policies and implementation of the environmental acquis. Regarding waste management MoE has to prepare a plan on the national strategy of waste management, is responsible for the waste managers register (WMR point 20), is the administrator of national waste statistics and the focal point for transboundary movements on waste.

Beside the MEPRD the following ministries are involved in waste management. The Ministry of Economy draws up and implements the national waste management programme aimed at the prevention and recovery of waste, creation of the market of products manufactured from secondary raw materials, safe disposal of waste and the setting-up of the waste management system. In addition, the ministry organises the handling of hazardous waste and puts forward proposals to the government concerning the application of economic and other types of measures. The Ministry of Health regulates the handling of medical waste. The Ministry of Social Security and Labour establishes the requirements for the safety at work in the facilities for the disposal and recovery of waste, organises the drafting of the regulatory documents on safety at work, the enforcement of which is ensured by the State Labour Inspectorate.

The State Environmental Protection Inspectorate (SEPI) is the main institution responsible for inspection and enforcement and the competent authority for transboundary movements on waste.

The eight regional environmental protection departments (REPDs) are subordinate to SEPI concerning, their main responsibilities. Regional environmental protection departments concern permitting, environmental impact assessment, labora-

(1) 'Waste management policies in central and east European countries: Current policies and trends, final report, DHV CR Ltd, Prague, July 2001.
(2) 'Environment 2000 - Ministry of the Environment annual report', 2001.
(3) 'National programme for the adoption of the acquis (NPAA)', 2002-03.

tory control and enforcement of environmental regulations. To carry out those functions, regional departments have a centrally based core staff and district environmental protection agencies. Inspectors have access to plants and installations. Operators have to keep inspectors informed. Inspectors can order laboratories to monitor pollution and they can impose penalties if regulations or permit conditions are violated.

The 56 environmental protection agencies (city or district level, administered by the REPDs) are responsible for inspection, enforcement and monitoring.

The county councils co-ordinate the preparation of waste management plans on county level. These plans should be based on the national strategy.

Local municipal institutions organise the implementation of laws and governmental decisions on environmental protection. Furthermore, they prepare, approve and implement the programmes, plans and projects concerning environmental protection within their jurisdictions. An example is the preparation of a municipal waste management plan which has to be co-ordinated with corresponding county plans.

Environmental monitoring in general as well as the establishment and management of the register database of waste management undertakings is in the responsibility of the Joint Research Centre (JRC) at the Ministry of the Environment.

In addition to the institutions described above, the Lithuanian Government is preparing for the establishment of an Environmental Protection Agency at central level. Although overall administrative capacity seems relatively adequate, the administrative capacity should be strengthened to a sufficient level to ensure implementation and further transposition of environmental legislation according to EC requirements. In certain areas, more staff and training is still needed. The administrative capacity for the development of EC-funded environmental projects in the Ministry of the Environment and elsewhere should be strengthened. Rationalisation of structures, to avoid duplication of work, and the establishment of new institutions, are a continuing necessity if the requirements of the acquis are to be met. Considerable investments need to be secured, also in the medium term, to ensure implementation of the environmental acquis.

Legal waste information requests

The waste management regulations (WMR), adopted by the Minister of the Environment in July 1999, provide new or improved requirements for waste management planning, data recording, registration of waste management enterprises and waste statistics.

WMR Chapter II regulates waste management plans requiring the preparation of national, county and municipal waste management plans (Clause 4). The information which should be covered is defined in WMR Clause 12 and specified, inter alia, in Clause 13.1: data on waste quantities produced, imported, exported, recovered and disposed shall be grouped by waste types and production sources.

Requirements concerning the registration of waste management undertakings, primary waste recording and national waste statistics are defined in WMR Chapters III to V.

Enterprises engaged in waste collection, transportation, recovery and disposal activities or arranging for waste management on behalf of others including importers and exporters are obliged (WMR Clause 21) to enlist at the register of management undertakings.

According to WMR Clause 30 registered waste management undertakings as well as undertakings involved in activities, listed in WMR Annex 11 and having more than 50 employees are obliged to keep record logs of waste generation and management. Waste recording must be started from the beginning of the year 2000.

WMR Chapter V deals with national waste statistics which are in the responsibility of the Ministry of the Environment. Waste recovery undertakings as well as waste exporters are obliged to report annually the data on waste handling using a special reporting form presented in Annex XIII.

WMR Chapters IX to XII are dedicated to hazardous waste covering identification and notification, packaging and labelling, hazardous waste consignment notes as well as record logs for recovery and disposal of hazardous waste. According to Clause 73, enterprises engaged in waste recovery or disposal shall record all stages of waste management (e.g. characteristics, transfer, time of performance, processes, actors).

The waste classification used in Lithuania is presented in WMR Annex II. It was prepared in accordance with the European waste catalogue and the list of hazardous waste. In addition, waste classification by materials is used which is made up according to the analogous classification used in the Council's project (COM (1999) 31 final) on waste management statistics.

Waste information collection

The waste information collection in Lithuania is regulated in the waste management rules (WMR). With the approval of WMR in 1999, a new waste data and reporting system was established, replacing the old one which had existed since 1993 for the collection of statistical data on waste.

The main features of the new waste data collection system are: a new waste classification, based on the European waste catalogue, registration of waste management undertakings, recording of waste generation and treatment by industries and waste management undertakings as well as reporting of disposal, recovery and recycling by waste management undertakings.

1. Registration of waste management undertakings (according to WMR Chapter III): enterprises and undertakings which are obliged to enlist at the register of waste management undertaking have to fill in the form of registration certificate for waste management enterprises presented in WMR Annex VII where the type of waste management shall be described. The possible types are fixed in WMR Annex VIII. Registration certificates are issued by the regional environmental protection departments. The data are collected in the database of the register of waste management undertakings at the Joint Research Centre.
2. Recording of waste generation and treatment by industries and waste management undertakings (according to WMR Chapter IV): starting from the beginning of the year 2000, enterprises and undertakings which are obliged to fill in primary waste recording logs have to use the form of primary waste recording log presented in WMR Annex IX. Affected enterprises, inter alia, have to record the waste accumulated before commencement of the log, waste denomination, waste quantities generated, transferred, received or managed, type of management as well as source and recipient of the waste [(1)]. Separately located branches or divi-

sions of an enterprise have to keep separate waste recording logs. The logs have to be submitted to the Ministry of the Environment, counties or municipalities upon their request.

3. Reporting of disposal, recovery and recycling by waste management undertakings (according to WMR Chapter V): enterprises which are obliged to report annually on waste management issues have to use the form of national waste recording report presented in WMR Annex XIII. The structure of the survey covers:
   - source of waste: code of geographical origin; code of industrial origin; denomination of waste;
   - features of waste: code of statistical classification; code of waste list; denomination of waste;
   - quantity of waste: quantity at the beginning of year; received from elsewhere over year; managed over year;
   - method of management: code by the list of management methods; denomination of management method.

Separately located branches or divisions of an enterprise shall submit individual reports. Reports for the preceding year shall be submitted by 25th January to the regional environmental protection departments. Final data processing is carried out by the Joint Research Centre of the Ministry of the Environment. Methodical guidance is performed by the Ministry of the Environment. The collected data are annually submitted to local municipal institutions as well as the county administrations. If municipalities need more data for drafting and implementation of management plans, they can obligate enterprises located in the municipality to submit additional data. A summary of the data shall be annually announced to the public in the annual report of the Ministry of the Environment.

Although the new waste data recording and reporting system is based on the requirements of the EU waste framework directive, a careful evaluation revealed still existing gaps, such as a limited application of the reporting data to the waste management planning process. Therefore, amendments to the WMR can be expected.

International reporting

Lithuania reports and replies to

- the Secretariat of the Basel Convention for its imports and exports of hazardous waste since 1999;
- the OECD/Eurostat questionnaire;
- the Baltic Environmental Forum (BEF) for the Baltic state of the environment report;
- the European Information and Observation Network (EIONET) for the state of the environment report (SoER);
- the European Environmental Agency (EEA).

Selection of documents

- 'Natural resources and environment protection 1999', Statistics Lithuania, Vilnius, 2000.
- 'Departments, activities and institutions subordinated', Ministry of the Environment of the Republic of Lithuania, Vilnius, 2000.
- 'Environment 2000 - Ministry of the Environment annual report', 2001, (http://www.am.lt/EN/VI/article.php3?article_id=16).
- 'National programme for the adoption of the acquis (NPAA)', 2002-03, (http://www.am.lt/EN/VI/article.php3?article_id=6).
- acquis implementation action plan 2001, (http://www.am.lt/EN/VI/article.php3?article_id=13).
- acquis implementation action plan for 2002-03, (http://www.am.lt/EN/VI/article.php3?article_id=13).
- law approximation action plan for the year 2001, (http://www.am.lt/EN/VI/article.php3?article_id=12).
- law approximation action plan for 2002-03, (http://www.am.lt/EN/VI/article.php3?article_id=12).
- 'Technical assistance in developing waste management data systems for Lithuania', Working Paper 1, Danish Environmental Protection Agency - Danish cooperation for environment in eastern Europe (Dancee), April 2000.
- 'Technical assistance in developing waste management data systems for Lithuania' - Phase 1, Working Paper 2, Dancee, May 2000.
- 'Technical assistance in developing waste management data systems for Lithuania' - Phase 1, Project document final draft, Dancee, July 2000.
- '2001 regular report on Lithuania's progress towards accession', European Commission, November 2001, (http://europa.eu.int/comm/enlargement/report2001/lt_en.pdf).
- 'Information collection in Phare countries on waste and on environment expenditure - State-of-the-art reports', Working Paper No 1/2002/F3, European Commission, 2002.
- 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
- 'Administrative capacity for implementation and enforcement of EU environmental policy in 13 candidate countries', sub-study assignment request No 6, Ecotec, final report to Environment DG, Brussels, 2001.

Institutions and contacts

Institution	Contact
Statistics Lithuania	www.std.lt
Ministry of the Environment	www.aplinkuma.lt
Baltic Environmental Forum	www.bef.lv

(1) It should be mentioned that the primary recording form (Annex IX) and the national waste recording report (Annex XIII) are constructed in such a way that the reporting obligations fixed in the Commission proposal for a waste management statistics regulation (COM(1999) 31) can be fulfilled.

Poland

Basic information waste management

The total amount of waste generated in Poland was 145.4 million tonnes in 1998. About 91 % (132 million tonnes) [1] of this waste was non-hazardous production waste which was mainly created by the mining industry as well as the metallurgical and non-ferrous metal industries.

The total amount of municipal waste was 12.3 million tonnes in 1998 (8 % of the total waste amount) [2]. Municipal wastes are mainly wastes from residences, facilities servicing people (trade, restaurants, schools, government offices, health-care, etc.) and from open terrain (roads, parks and recreation areas) and include wastes from handicraft shops and branches of industry which produce wastes similar to municipal ones.

In 1998, 1.1 million tons of hazardous waste (around 1 % of the total) [3] were generated, mainly toxic wastes produced by chemical (non iron metals) and coking industries, steel-mills, the machine building industry and some branches of light industry. Hazardous waste was created in small quantities throughout the whole country, but their largest concentrations occured in southern Poland (mainly Katowice, Legnica, Walbrzych and Krakow voivodeships [4]).

Landfilling is the major disposal route for all categories of waste although waste incineration takes place to some extent. A total number of 998 landfills for municipal waste and 68 landfills for hazardous waste was reported for Poland [5]. In 1995, the amount of industrial wastes which were deposited in landfills, spoil-heaps, settling ponds, etc. amounted to 55.5 million tonnes [6]. Regarding the spatial distribution of industrial wastes the largest potential hazard was observed in Katowice (over half of the total amount of wastes in the country!) and Legnica voivodeships (over 20 % of the total). The amount of wastes directed to landfills and similar facilities was the largest in these two voivodships. In 1995, almost 99 % of the municipal waste was landfilled. In addition, about 1 000 tonnes of ashes from the incineration of dangerous medical waste were dumped in communal landfills.

Regarding separate collection and recycling in 1999, developed systems for metals, paper/cardboard and end-of-life vehicles (ELV) existed. In addition, collection and/or recycling of batteries, electric and electronic equipment (WEEE), oils, packaging, glass, plastics and tyres was taking place to some extent.

Management of End-of-Life Vehicles (ELV) in Poland

During the last few years, the number of cars in Poland has increased and in 1999 the value of 13 million cars was reached, out of which 9 million are passenger cars. Among them, approximately 40 % constitutes passenger cars older than 10 years. Thus, a phase of replacement of old cars by new ones is expected, which will lead to growing numbers of ELVs. It is estimated that already 100 000-300 000 ELVs are generated annually. This amount might increase up to the year 2010 to 650 000-700 000 annually.

The already existing processing base for materials from ELV such as scrap metal, glass, accumulators, tyres, plastics, cooler and brake liquids, is quite well developed. In Poland, there are also plants regenerating car parts, alternators and starters. It is estimated that up to 500 companies with legal permits operate in Poland, while the largest 20-30 ones dismantle more than 500 cars annually. Besides the licensed sites, there are about a thousand illegal ones which rarely meet proper technical and environmental standards. Most of the dismantling is carried out manually.

Up to 50 % of some parts is reused on the second-hand spare parts market (doors, windows, wheels, engines, gear-boxes, alternators, starters, coolers etc.). The rest, which is composed of steel, non-ferrous metals, oil, brake fluids and plastics, is sold as secondary raw material or reprocessed (e.g. waste oils and brake fluids). The average prices of dismantled parts represent on average 10-30 % of the prices of new parts.

The disposal of end-of-life vehicles in Poland is based upon the Waste Act, Traffic Act and Act on Maintaining Cleanness and Order in Public Space. But there are still some unauthorised dismantling stations which do not meet environmental protection standards. For improvement of this situation and the development of a vehicle recycling system a governmental working group was established in February 2001. It is composed of the Ministry of the Environment, Ministry of Economy, Ministry of Transport, National Environmental Inspectorate, and research institutes. The main task of this body is to implement Directive 2000/53/EC on ELVs. Furthermore, the Polish Forum for Car Recycling (FORS) was established by a group of car producers and importers, collectors, de-assembling firms, government, media and research bodies. FORS undertakes activities like legal support for members, information support and exchange as well as awareness raising campaigns.

Waste management planning and strategy

Waste management strategy

In Poland the national waste management strategy and implementation plans are elaborated in two documents: 'Strategy for balanced development in Poland till 2025' and especially 'The second national environmental policy' [7]. According to the latter document the basic ideas of waste management policy are the sustainable development principle and an integrated approach to environmental protection. The concept of the new strategy is to involve all business and social partners. The overall waste management policy objective is the prevention of waste generation at source, raw material recovery and waste reuse,

(1) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(2) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(3) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(4) Voivodeships are regional governments (provinces).
(5) 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(6) State of the Environment in Poland, State Inspectorate for Environmental Protection and the UNEP/GRID Warsaw Centre, 1997.
(7) 'The second national environmental policy', Ministry of the Environment, Warsaw, December 2000.

and final disposal of non-utilised wastes in an environmentally safe way.

Numerous objectives are set with short-term priority, medium-term perspective and long-term perspective. The short-term priority objectives (the period between 2000-02) in waste management include, inter alia, the development of a waste management strategy and waste management plans at national, regional and local levels, the implementation of a comprehensive registration system of wastes and waste management methods (database), and the preparation of a suitable waste register, including a regular reporting on waste management, both for the domestic needs and those of the European Union.

In the medium-term perspective (the years 2003-10) the full implementation of requirements set out in the EU waste specific legislations should be realised, inter alia country-wide selective collection systems for particular waste streams (e.g. waste oils, used batteries, packaging waste) including hazardous waste should be established as well as an effective monitoring system including control and register of waste.

As regards waste planning and programming, Poland has started preparations for the national waste management plan. However, according to estimates only 25 % of the gminas (municipalities) have developed waste management plans. The strengthening of the capacity of gmina and speeding up their preparations for EU environmental policy is considered to be vital in order to ensure that Poland has the necessary programming capacity at accession [1].

Expenditure

In total the EU approximation costs in the waste management sector are estimated to amount to EUR 95-105 per capita [2]. The Polish Ministry of the Environment estimates the investment costs for the harmonisation of the Polish economy with the European Union requirements in the field of waste management to be PLN 5.2 billion for the short-term period 2000-02 and PLN 10.6 billion for the mid-term period 2003-10 (1999 prices) [3].

Regarding economic instruments in Poland, both disposal charges (differentiated between hazardous and non-hazardous waste) and landfill charges are used as revenue for the Environmental Fund (around EUR 41 million in 1999). Municipalities base user charges (municipal waste) on the volume of waste which are adjusted annually. In 1999, they were ranging between EUR 22 and 80 per tonne depending on frequency of services, transport costs and size of containers, although in some municipalities charges were negotiable. No product charges/taxes are reported.

Legal and institutional framework

Legislation

The specific legislation on waste management, presently in force, includes:

- Act on Waste, Dz. U. 97.96.592 (entered into force in October 2001);
- Act on the Responsibilities of Enterprises for the Management of Selected Wastes and on Product and Deposit Fees (entered into force in January 2002);
- Law on Packaging and Packaging Waste (entered into force in January 2002);
- Environmental Protection Law;
- Statute of 27 April 2001 on Wastes, Dz.U. 2001 no 62 item 628 (Executive Acts);
- Statute of 11 May 2001 on Packaging and Packaging Wastes, Dz.U. 2001 no 63 item 638;
- Statute of 11 May 2001 on the duties of contractors concerning the management of some types of wastes and the product and deposit fees, Dz.U. 2001 no 63 item 639 (Executive Acts);
- Statute of 27 July 2001 on the introduction of the Statute - Environmental Protection Law, Statute on Wastes and amendments to some statutes, Dz.U. 2001 no 100 item 1085;
- a statistical programme is elaborated annually by the Central Statistical Office of Poland and adopted by government.

With the enforcement of the above listed legal acts [4] the full transposition of the acquis on waste management will be ensured [5].

However, according to the proposal for a Council decision on the principles, priorities, intermediate objectives and conditions contained in the accession partnership with Poland from November 2001 the implementation activities regarding the directives on waste and on hazardous waste, and the strengthening of the administrative, monitoring and enforcement capacity at national, regional and local level have to be continued.

Institutional Framework

The Ministry of the Environment (MoE) is the main central (national) institution for development and implementation of the national waste management policy and has an extensive departmental structure [6].

Beside the MEPRD the following ministries are involved in waste management: the Minister of Economy (selected types of waste), the Office for Housing and Urban Development (municipal economy e.g. municipal waste management), the Minister of Finance (economic instruments) and the Minister of National Defence (waste management).

(1) '2001 regular report on Poland's progress towards accession', November 2001.
(2) Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
(3) 'The second national environmental policy', Ministry of the Environment, Warsaw, December 2000.
(4) With the exception of the provisions on the heavy metal content in packaging which will come into effect in 2003.
(5) '2001 regular report on Poland's progress towards accession', November 2001.
(6) This section is based on: Administrative capacity for implementation and enforcement of EU environmental policy in the 13 candidate countries, Ecotec; IEEP, FEI; European Commission, Environment DG, 2001.

The Chief Inspectorate of Environmental Protection is not part of the MoE but it works under supervision of MoE. It is responsible for implementation of the national environmental monitoring system (establishing of references laboratories, using proper methodology of measures etc.), management of environmental emergency protection, transboundary movement of waste etc. For most inspection activities, however, the Chief Inspectorate is only responsible for general co-ordination, the primary inspection responsibility rests with the voivodeships [(1)].

The 16 voivodeships (regional government, provinces) are responsible for implementation of legislation and take decisions on environmental investments. At their level, they are responsible for permitting and inspection. Voivodeships have responsibility for all activities that are especially harmful to the environment. The poviats (counties) are responsible for the implementation of environmental policy at county level, including both permitting and inspection. The poviats are responsible (in certain circumstances) for issuing permits. Gminas (municipalities) are responsible for carrying out decisions for implementation taken at higher levels, and have direct responsibility for waste management and particularly municipal waste. Gminas regulate and control the quantity of industrial discharges into sewage systems and are executing municipal waste management based on the Commune Programme on Environment Protection in compliance with the principles of the Law on Keeping Communes Clean of 1996.

The Statistical Office (GUS) carries out a survey on municipal waste and on environmental expenditures.

According to the 2001 regular report of the EC, Poland has carried out some actions to develop its administrative capacity in the field of the environment. The Ministry of the Environment has been strengthened and co-ordination between its various departments as well as with other ministries has improved. The units dealing with EU issues have been granted more staff. Also, decisions have been taken to increase the staff of the various environmental authorities, including the voivodships, poviats and gminas in view of their implementation of EU directives but this has not yet been carried out.

In spite of these efforts Poland's administrative capacity for EC environmental directives remains a matter of concern. The voivodeships and poviats still need to be strengthened. Staff resources are limited and the awareness about the requirements of EU environmental directives needs to be improved. Significant training in EU environmental policy is still necessary, Poland's division of tasks over numerous agencies and administrative levels has, in some cases, caused unclear responsibilities. Different bodies are responsible for setting objectives, permitting, monitoring, inspection and financial instruments. This risks diminishing the accountability for achieving environmental standards.

Legal waste information requests

In July 2001, a revised law on waste entered into force which considerably increased the requirements on the scope of data on waste collected by administrative authorities. In addition to the new waste law, various regulations were adopted in 2001 covering different areas of waste management. A selection of the new executive acts dealing especially with information requests on waste is given below [(2)]:

- regulation of the Minister of Internal Affairs and Administration of 13 May 2002 on the register of border crossings through which wastes may be imported or exported, Dz.U. 2002 No 60 item 548;
- regulation of the Minister of the Environment of 27 September 2001 on the catalogue of wastes, Dz.U. 2001 No 112 item 1206;
- regulation of the Minister of the Environment of 11 December 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 December 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 enterprises which may use simplified records of wastes, Dz.U. 2001 No 152 item 1735;
- regulation of the Minister of the Environment of 11 December 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;
- regulation of the Minister of the Environment of 11 December 2001 on the conditions and scope of access to the provincial database concerning producing and management of wastes, Dz.U. 2001 No 152 item 1738;
- regulation of the Minister of the Environment of 11 December 2001 on the necessary scope of information subject to the obligation of assembly, processing and method of managing central and provincial data concerning producing and management of wastes, Dz.U. 2001 No 152 item 1740;
- regulation of the Council of Ministers of 30 June 2001 on annual levels of recovery and recycling of packaging wastes and secondary raw materials, Dz. U. 2001 No 69 item 719.

Waste information collection

In Poland surveys on waste are conducted annually covering:

- industrial waste and other waste;
- municipal waste;
- hazardous waste.

The Central Statistical Office is carrying out surveys on industrial and other waste (Form OS-6) as well as surveys on municipal waste (Form M-09).

Form OS-6: The Agricultural and Environment Statistics Division is responsible for the survey on industrial waste. All enterprises (publicly and privately owned), that generate annually more than one thousand tonnes of industrial and other waste covered by classification (excluding municipal waste) or enterprises having one million and more tonnes of waste gathered on their own area have to reply. The questionnaire includes two tables:

1. Types and quantities of waste (generated waste amounts, utilisation of wastes for industrial purposes, treatment and disposal);

(1) Voivodeships are regional governments, poviats are counties and gminas are municipalities.
(2) For further information see the following web site (http://193.0.91.125/cgi-bin/b_plen.cgi?EN=Wastes).

2. Area of disposal sites which are reclaimed and non-reclaimed.

Form M-09: The survey on municipal waste is in the responsibility of the Production and Services Statistics Division. Data are collected through regional statistical offices located in the voivodeships. The Form M-09 has to be filled out by all units involved in the activity of cleaning streets and squares, disposal of solid and liquid waste from residential sites, including waste treatment. This questionnaire includes six tables.

1. Waste transported (collected) during the year (total, differentiated for paper, glass, metals, plastics and liquid waste);
2. Waste transported (collected) during the year from households (total, differentiated for paper, glass, metals, plastics and liquid waste);
3. Total area of cleaned streets and squares;
4. Landfills (number, total area, area for landfills in operation and landfills of finished operation);
5. Landfill gas extraction system (number of landfills with gas extraction system, type of burner, with/without energy recovery);
6. Waste treatment (amount of waste treated in incineration plants, composting plants, waste amounts transported to landfills).

The inspectorates for environmental protection supervised by the Ministry of the Environment are collecting data on hazardous waste in the frame of the State environment monitoring system (waste subsystem). The inquiry on hazardous waste concerns all units generating annually more than 30 tonnes of hazardous waste and 10 % of other (less than 30 tonnes) hazardous waste producers. They have to hand over their reports to the inspectorates for environmental protection on voivodeship level.

Since January 1998 a new classification system has been used for the surveys on waste which is harmonised with EU classification. Before 1998 surveys were conducted on the base of a national classification of waste which was quite different from the classification actually in use.

The new law on waste which entered into force on 1 July 2001 has considerably increased the requirements on the scope of data on waste collected by administrative authorities. Due to the planned simplified system generators of waste have to prepare at the end of every year questionnaires covering the description on waste generation and management and send them to the "marshalships" at regional "voivodeship" level. In addition, the enterprises collecting municipal waste will elaborate their own inquiries, and responses are to be sent out to the marshalships as well. Then, finally, the aggregated data are expected to be sent to the Ministry of the Environment.

International reporting

Poland replies to the OECD/Eurostat questionnaire.

According to 'The second national environmental policy' published by the MoE, Poland will start to build up numerous cooperations and memberships at international level in the short and medium term like:

- achievement of membership to European Environmental Agency;
- reporting to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

Selection of documents

- 'The second national environmental policy', Ministry of the Environment, Warsaw, December 2000, (http://www.mos.gov.pl/mos/publikac/Raporty_opracowania/II_PEP_english.doc).
- Statistical yearbook of the Republic of Poland 2000, Central Statistical Office of Poland; GUS, Warsaw, November 2000.
- State of the environment in Poland, State Inspectorate for Environmental Protection and the UNEP/GRID Warsaw Centre, 1997, (http://www.mos.gov.pl/soe/index.html).
- Quarterly Statistics 1999, No 3, Central Statistical Office of Poland, GUS.
- '2001 regular report on Poland's progress towards accession, November 2001, (http://europa.eu.int/comm/enlargement/report2001/pl_en.pdf).
- Proposal for a Council decision on the principles, priorities, intermediate objectives and conditions contained in the accession partnership with Poland, November 2001, (http://europa.eu.int/comm/enlargement/report2001/appl_en.pdf).
- 'Waste management policies in central and east European countries: Current policies and trends', final report, DHV CR Ltd, Prague, July 2001.
- European Commission: Information Collection in Phare Countries on Waste and on Environment Expenditure - State-of-the-art Reports, , Working Paper No 1/2002/F3, 2002.
- 'Administrative capacity for implementation and enforcement of EU environmental policy in 13 candidate countries', substudy, Assignment Request No 6, Ecotec, final report to Environment DG, Brussels, 2001.

Questionnaires:

- M-09 reporting form on collected and neutralised waste to be filled out by municipalities
- OS-6 reporting form on waste (excluding municipal waste)

Institutions and contacts

Institution	Contact
Ministry of the Environment	www.mos.gov.pl
GUS Central Statistical Office - Agriculture and Environment Statistics Division	www.stat.gov.pl
Technical University of Bialystok, Department of Environmental Management	www.cksr.ac.bialystok.pl

Romania

Basic information waste management

Waste statistics were introduced in Romania in 1993, using initially a Romanian waste catalogue. Although the Government Ordinance No 155/1999 on the adoption of the European waste catalogue was only issued in 1999, in practice, the statistics of waste had been based on this classification of waste since 1995. As a result, a series of homogenous data is available from the period 1995-2000, at least for the main categories of waste. These data are mostly expert estimations as landfills are hardly equipped with weighing bridges. The landfilled quantity is estimated by the number of transports and the vehicles capacity (m^3) (1).

The total amounts of waste generated yearly show a substantial decrease from 353 million tonnes in 1995 to 55 million tonnes or 2.45 tonnes per capita in 2000. The decrease of the total production waste is a result of the dramatic reduction in mining and quarrying waste and a moderate decrease in manufacturing waste and other types of industrial waste.

The main categories of generated industrial waste are mining waste, slag and ashes from thermo-power and combustion plants, waste from inorganic and organic chemical processes, metallurgical slags and ashes from ferrous and non-ferrous metallurgy and residual sludge from industrial processes and wastewater treatment.

The production waste management is organised by the generators of waste, which are using their own facilities or are paying such services to specialised companies.

According to the draft national strategy for waste management in Romania, production waste (excluding waste from mining and quarrying which is used as covering material) is managed as follows:

- 65-74 % is landfilled;
- 25-34 % is recovered;
- 2-4 % is temporarily stored for recovering purposes;
- 0.5-1.5 % is incinerated or co-incinerated.

The recovery of industrial waste is mainly carried out by the same industries that have generated it (about 55 %). A mere 5 % of the total amount of waste was recovered in specialized facilities (REMAT), while 34 % was traded to other factories, which use it as secondary raw material input to the respective manufacturing processes. More than 6 % was recovered by selling it to the population (in particular wood waste).

The activity of specialised recycling companies (REMAT) is focused on ferrous and non-ferrous metals including metallic scraps, on paper and cardboard, glass, waste lead batteries and electric/electronic waste.

At present, there are around 400 companies authorised as required by the Emergency Ordinance 15/2001 approved by the Law 426/2001 referring to the recovery of recyclable waste (ferrous and non-ferrous, paper/cardboard and plastics) in order to be sold as secondary raw materials.

Landfilling represents the main disposal option for industrial and agricultural waste, being applied for around 70 % of the total generated waste. At present, 951 industrial landfills are used in Romania covering a total area of around 12000 ha. Most of them (354) are not especially engineered, but there are also mining waste deposits (251) and lagoons (209) which have some facilities.

Only 30 % of the industrial landfills operate on the basis of a licence. All the other landfills do not own an operating licence, although several such landfills are located inadequately and are not monitored at all. For example, 34 % of the industrial landfills are sited within town limits, while 6 % of the industrial landfills are located nearby riverbanks. Only 60 % of the landfills are sited outside localities.

At least 50 % of the total industrial waste deposits has no facilities for environmental protection; most deposits are only fenced. Some deposits have special engineered facilities such as lining, drainage, monitoring wells, but only a few are constructed in such a way to fulfil all requirements for environmental protection.

The most engineered production waste deposits are those for slag and ash resulting from energy production based on coal burning. They usually have mineral lining, dikes, drainage system for leachate and surface running water collection, monitoring wells and are continuously surveyed by guardians.

There are also some other engineered deposits such as lagoons for chemical waste, petroleum waste and sludges containing heavy metals or deposits for metallurgical waste and agricultural waste (manure or sludge from animal breeding wastewater treatment plants).

Hazardous waste represents a special category of production waste. In Romania, 157 different types of hazardous waste have been identified of the total of 237 types listed by the European waste catalogue for the year 2000.

The amount of hazardous waste has decreased since 1995 from 5.7 million tonnes to 0.9 million tonnes in 2000.

The main quantities of hazardous waste in Romania are generated by eight industrial branches, which are producing approximately 90 % of the total reported quantities. The largest amount of hazardous waste was generated by the chemical industry - mainly calcined soda waste and phosphogypsum. Likewise, metallurgical industrial units discharge large amounts of hazardous waste, mainly slags from aluminium metallurgy and other non-ferrous metallurgy. As far as oil-processing industries are concerned, the largest amounts of hazardous waste are sludges from oil tanks. The electrical and optical equipment industry has discharged mainly chromium sludges, cyanide sludges and non-chlorine used oils.

Only 20-24 % of hazardous waste has been recovered, the remaining quantities being landfilled or used as fuel (co-incinerated). In 1999, 83 industrial landfills for hazardous waste were inventoried in 30 districts, covering a total ground area of about 450 ha.

The category of municipal solid waste (MSW) comprises the subcategories household waste and similar waste generated by institutions, enterprises, small commercial, entities, etc., other

(1) The presentation of waste management in Romania is based on their national strategy for waste management, draft final report, 2002. It has to be emphasised that this report is not yet approved by the parties concerned. Other sources are indicated by footnotes.

types of waste including market, commercial, street, construction/demolition waste; and sewage sludge generated from urban wastewater treatment.

In 2000, there were 8.15 million tonnes of municipal waste generated, which represents 14.8 % of the total amount of waste generation. The amount of municipal waste covers the quantities of waste collected and reported by the sanitation companies which are usually active in urban areas and cover with their services only partially the surrounding rural areas.

It is estimated that about 80 % of the urban population is served by collection services, while no collection schemes exist in rural areas. In Romania, about 11.85 million people (53 %) of the total population of 22.5 million are living in urban areas. Thus, only 9.5 million inhabitants (42 %) of the total population are covered by collection services. The waste from areas without collection is usually disposed of on local dump sites [(1)].

Household waste, which represents with 75-80 % the biggest part of MSW, is not selectively collected in order to recover recyclable materials (paper, board, glass, plastics, metals) and only 1-2 % is recovered by scavengers. However, in the last one to two years some private economic entities have initiated a sustained collection of packaging cardboard waste and PET bottles from large generating sources. Collected materials are exported to Hungary, Bulgaria, Italy, China or Korea. There are no officially available data on the export of these types of waste.

Pilot projects on selective collection have been developed in some localities by organising collection points where people could bring (with or without payment) waste paper, glass, or plastic bottles. Information presented by the Ministry of Industry and Resources shows 2 500 waste collection points were operational till the year 2000.

More than 90 % of generated MSW is disposed of by landfilling. At least one designated site for waste disposal exists in each urban or rural area, but there are cities where two or more landfills in operation (Bucharest, Oradea).

Some 303 landfills, occupying 1 236 ha, have been registered in urban areas but they represent only a small part of total MSW disposal places. Recent inquiries (2001) have inventoried only in the rural areas of 19 counties a number of 2 003 mixed disposal places for urban and agricultural waste, whose surface has been evaluated to more than 1 800 ha.

Most MSW deposits are mixed dumping sites (60 %), which accept both, urban and industrial waste, sometimes even hazardous waste. Only 30 % of urban landfills is used only for MSW disposal, while 10 % are dedicated to municipal sludge disposal.

Urban waste deposits are not engineered as real landfills. More than 40 % are dumping sites without any specific facility, 45 % is delimited by fences or dikes, the remaining 15 % has natural clay barriers. Waste compaction on sites is achieved only periodically if compacting vehicles are available. Covering landfilled waste is also not a common practice and waste composting, gasification and incineration are not practised for MSW in Romania.

At present, only 10 real (new) landfills are in operation, two of them for Bucharest municipality, but many projects are in different preparation phases.

Waste management planning and strategy

Waste management strategy

There are two recently finalised documents relevant for waste management planning, the national strategy on waste management and the national action plan for waste management. As mentioned before, both documents are drafts.

The national waste management strategy expresses the national concept of implementing the EU legislation in the waste field. Romania is expected to transpose and fully comply with the directives by 2007 except for the three directives for which transitional periods have been requested (landfill, incinerators and packaging).

The national action plan for waste management will create the legal framework for accomplishment of tasks enumerated in Romania's position document, by presenting actions and planning to fulfil the strategic objectives in the waste field.

After consultation with stakeholders, the proposed national waste management strategy has to be to completed and formally adopted by the end of this year. Detailed implementation plans will also be prepared and completed at sectorial and local level.

Expenditure

In 1999, the environmental expenditures amounted to ROL 7981.991 billion, most of which was spent on pollution abatement. Some 30 % of environmental expenditures was spent on waste management.

Expenditures	Amount (billion ROL) in 1999
Environmental expenditures, of which	7981.991
Expenditures for pollution abatement, of which	7166.730
Expenditures for waste management, of which	2397.383
investment	528.644

Data Source: INS (National Institute for Statistics) - Phare pilot project on environmental expenditures (2000).

According to a recent study (DHV, 2001) the compliance costs for the waste management sector are estimated to be around EUR 6000 million [(2)]. Waste management is one of the priority areas of the overall investment strategy, in particular the remediation of old landfills, the construction of waste treatment and disposal facilities (landfills for MSW, industrial waste and hazardous waste, incinerators for clinical and other hazardous waste) and the establishment of a network for the separate collection of recyclable waste in selected municipalities. User charges for municipal waste services amount to EUR 9 per inhabitant annually, and EUR 12.53 per m³ are charged for commercial users. The EU compliance costs for investments in the

(1) 'Database on packaging and packaging waste in Romania', ARGUS GmbH, ICIM, German Federal Environment Agency, 2002.
(2) 'Waste management policies in central and east European countries: Current policies and trends, Prague, DHV CR Ltd, July 2001.

waste sector are estimated to amount to EUR 115-180 per capita.

Legal and institutional framework

Legislation

At present, the legislation on waste comprises the following acts:

- Law 137/1995 regarding the environmental protection (re-published on 17.2.2000);
- Governmental Decision 155/1999 for the introduction of waste statistics and use of the European catalogue of waste;
- Law 426/2001 for approval and completion of the Emergency Ordinance No 78/2000 on waste regime;
- Law 326/2001 on public sanitation services;
- Law 465/2001 for approval of Emergency Ordinance No 16/2001 on industrial recyclable waste management;
- Governmental Decision 662/2001 on management of waste oils;
- Governmental Decision 1057/2001 on the regime of waste batteries and accumulators containing hazardous substances;
- Governmental Decision 162/2002 on waste landfilling;
- Governmental Decision 128/2002 on waste incineration;
- Governmental Decision 349/2002 on packaging and packaging waste;
- Governmental Decision 173/2000 on control of PCBs and PCTs.

The legislative framework for the transport of hazardous waste is:

- Law 6/1991 for Romania's adhering to the Basel Convention on the Control of Transboundary Movement of Hazardous Waste and its Disposal;
- Law 31/1994 for Romania's adhering to the European agreement on international road transport of hazardous merchandises.

The provisions of the Directive 75/442/EEC have been included in the national legislation by the Law 426/2001 for the completion and approval of the Emergency Ordinance 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.

The deadline for approximation of the framework directive on waste including its amendments and directives on hazardous waste is the year 2002, while the deadline for approximation of the other directives is 2004.

Regulation (EEC) No 259/93 on waste shipment will be enforced as soon as Romania are accepted into the European Community; preparation for its implementation will be made by adoption of similar national rules during the phase of legislative approximation.

Institutional framework

The main national administrative institutions for waste management is the Ministry of Water and Environment Protection (MoWEP), through its Directorate of Hazardous Substances and Waste Management.

The National Research Institute for Environmental Protection (ICIM), Solid Waste Department is managing the waste database.

At sub-national level 42 environmental protection inspectorates (EPIs) (corresponding to the 42 counties of the country) are responsible for permitting, inspection, enforcement and monitoring. They report to the MoWEP, but are partially self-financed.

Local authorities, at the county and municipal levels, manage environmental infrastructure (i.e. wastewater treatment works, water and sewage networks, landfills), identify and propose environmental projects for investment, grant development permits and provide environmental services to the population.

The Law of Public Communal Services (326/2001) stipulates that the organisation, coordination and control of public services, including waste management is the task of local administrative authorities. This task could be fulfilled directly by the local councils or indirectly by delegation of responsibilities.

Delegation of waste management responsibilities is made by public bidding and based on a concession contract signed by the licensed companies chosen by bidding. The waste management activities within a locality could be conceded to one or many service providers. In case of many service providers, concession contracts could refer to only one type of activity (collection of household waste, street sweeping, landfill operation) or to all activities included in one locality sector, the territory of the locality being divided into many sectors.

The private sector represents more than 50 % in providing waste management services and the trend is to increase this percentage.

Legal waste information requests

Each institution and company that receives questionnaires from environmental protection inspectorates (EPIs) is obliged to answer in accordance with the Governmental Decision No 9/1992 and the Law No 11/1994 on Public Statistics, the Governmental Decision No 155/1999 and the Emergency Ordinance No 78/2000. These legal acts stipulate penalties both in case of refusal or delay of data transmission and in case of wrong or incomplete data.

Waste information collection

Waste arisings and management have been monitored in Romania since the early 1990s by the National Institute of Environmental Research and Engineering (ICIM), where a waste database has been developed. ICIM is a national institute coordinated by the Romanian Ministry of Waters and Environmental Protection and carries out research and studies in the field of environmental protection and engineering. ICIM manages the Romanian database on waste and reports in different forms to the Ministry of Environment (MWFEP), to the National Institute for Statistics and Economic Studies and to international bodies like Eurostat, UNEP and the Basel Convention Secretariat.

The annual waste statistics are based on questionnaires, which have been gradually enlarged and adapted to the needs of national and international monitoring and reporting requirements.

A new set of questionnaires has been established for the year 2000 to close the gaps with relation to EU reporting obligations fixed in the Council Directive 91/692/EEC and in the OECD/Eurostat questionnaire.

The questionnaires are sent to waste producers, waste management companies and municipalities in each county/judet in Romania by the 42 local Environmental Protection Inspectorates (EPIs). Operators, to which the questionnaires are sent, are selected by the local EPIs, based on the environmental impact of the companies, thus including all relevant actors. In 2001, about 6 000 companies were addressed.

The EPIs submit the data to the Solid Waste Department of ICIM in electronic format, where they are processed. There are five different types of questionnaires addressing the following issues:

- generation of waste (GD-PRODESS 1);
- collection and management of municipal waste (GD-MUN 2);
- recycling of waste (GD-RECIC 3);
- disposal of waste in landfills (GD-DEPOZ 4);
- incineration of waste (GD-INCIN 5).

The questionnaire form GD-PRODESS 1 is sent to waste producers in industry, agriculture and asks about waste generation, the measurement method (weighing or estimation) and destination of the waste, e.g. recycling, incineration and disposal, including data on their own disposal sites, using the treatment and disposal codes of the EU waste framework directive.

The questionnaire form GD-MUN 2 addressing municipalities and sanitation companies, asks about municipal waste arising and distinguishes between household, commercial waste and waste from municipal services (street waste). For the quantities of collected waste also the measurement method and the destination of waste has to be declared. This questionnaire refers also to the municipal waste composition according to the main recyclable materials (paper/board, glass, metal, plastics, textiles, organics, others) and to municipal disposal sites and their characteristics.

The questionnaire form GD-RECIC 3 is sent to recyclers and contains questions on the type and amount of collected and treated waste, the metod of treatment or sorting and the storage of waste.

The questionnaire form GD-DEPOZ 4 addressing landfill operators, which are neither waste producers or municipal waste operators, asks for the type and amount of waste being landfilled and the characteristics of the landfill.

The questionnaire form GD-INCIN 5 to be filled in by 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.

Reported quantities are predominantly based on volume estimates, except for recyclable waste and other waste for which companies have to pay. According to the results of the survey on municipal waste for the year 2000, 5 % of the reported quantities is weighed, while 95 % are volume estimates based on the number of trucks. The collection and quality of data about waste/waste management activities have been improved in the recent years, but there are still some major gaps and weaknesses, notably in the following areas [1]:

- Information about some waste streams (e.g. the quantities and types of hazardous waste, the composition of municipal solid waste) and some waste producers and facilities;
- Control procedures for verifying accuracy of declared information on waste;
- System for disseminating data and information on waste and waste management activities in a consistent and standardised format.

According to a proposal in the national strategy a National Waste Management Centre will be established and responsible for developing and improving the existing national waste management information system. Development is likely to require the establishment of many national computerised databases for data storage, processing and retrieval, supported by integrated systems and procedures for data gathering, verification and reporting.

The Waste Management Centre will have the following main task:

- Maintenance and updating databases on waste generation and management in general, on specific waste flow generation and management (packaging, PCB/PCT, batteries/ accumulators) and waste management facilities (landfills, incinerators, composting plants);
- Monitoring the quality of different wastes (by types of waste - urban, production or hazardous waste).

The centre will participate in the elaboration of standards, guidelines or rules of good practice, and will assure consultancy services for establishing appropriate solutions for management of different waste types. It will be possible that some specialists in waste management within ICIM will represent the initial team of this centre.

International reporting

Romania reports and replies to:

- the joint questionnaire of OECD/ Eurostat;
- UNEP and Basel Convention Secretariat.

Selection of documents

- Emergency ordinance regarding waste regime, published in OJ, 22.6.2000.
- 'State of the environment in Romania in 2000', http://www.mappm.ro/WebTest/Starea_Mediului_2000/SoE_Romania_v1/index.htm
- 'National strategy for waste management in Romania', draft final report, 2002.
- 'National action plan for waste management in Romania', draft final report, 2002.
- 'Database on packaging and packaging waste in Romania', German Federal Environment Agency, ARGUS GmbH & ICIM, Berlin 2002, not published.

(1) 'National action plan for waste management in Romania', draft final report, May 2002.

- 'Waste management policies in central and east European countries: Current policies and trends', DHV CR Ltd, Prague, July 2001.
- 'National waste data plan'; Annex 10 to the fourth quarterly report of Twinning Project RO 98/IB.
- Questionnaire set of five waste questionnaires on waste producers, municipal waste management and collection, waste recycling, waste landfills and waste incinerators.

Institutions and contacts

Institution	Contact
Ministry of Waters, and Environmental Protection	http://www.mappm.ro
National Research and Development Institute for Environmental Protection, ICIM - Waste Department	http://www.icim.ro
National Institute of Statistics (INS); Department of Agricultural, Forestry and Environmental Statistics	http://www.ins.ro

Slovakia

Basic information waste management

According to the regional information system on waste (RISO) Slovakia's waste amount decreased from 33.6 million tonnes in 1992 down to 19.6 million tonnes in 1999. This is not only a result of a good waste management, but also a consequence of a decrease in production. Only 8.7 % of the waste generated in Slovakia is municipal waste, 7.1 % is hazardous waste (1).

In 2001, the country had at its disposal two municipal waste plus 69 hazardous waste incinerators. Municipal waste was disposed of in 141 landfills. In the same year 159 landfills were closed due to their non-compliance with modern standards. The landfill capacity is sufficient for about 100 years (2).

A survey for 1999 carried out by the Statistical Office of the Slovak Republic (3) had the result that 34 % of the country's industrial waste came from livestock breeding and slaughter. Other important waste sources are oil processing and coal upgrading, mineral waste and foodstuff. In the same year 1.1 million tonnes of scrap iron were recycled. Also waste rubber and tyres, non-ferrous metal, textiles, plastic and sawdust were used as a secondary raw material.

The same survey revealed that in 1999, 1.4 million tonnes of hazardous waste were generated. Some 35 % had to undergo a biological treatment, 21 % was recycled, 9.8 % was sent to a physical-chemical treatment, 7.8 % was incinerated, 15 % was landfilled.

In order to give advice to producers of hazardous waste, the Slovak Environmental Agency (SEA) has established a Hazardous Waste Information Centre. In Slovakia, there are plants for solvent recycling, waste oil treatment for energy use, neutralisation of acids and bases and the recycling of lead accumulators.

The Slovak Government is very concerned about the safe disposal of medical waste. Regional disposal centres were founded and 30 special incineration plants were put into operation.

An important problem is the lack of incineration capacities. In some enterprises, small hazardous waste incineration plants have been installed. But neither the Slovakian companies nor the government have enough money to build enough of them. Slovakia planned in its waste management plan to build at least one supra-regional incineration plant until 2000. The government has promised its financial support for this project.

In spite of this problem, Slovakia imported 700000 tonnes of hazardous waste in 1999, above all from the Czech Republic and from Ukraine. During the same period, Slovakia only exported 7 700 tonnes, mostly to western European countries like Belgium or Germany. Export has decreased by 43 % since 1996. Only a few wastes - especially those contaminated with PCB and printing colours scrap - have got a permit to be transported abroad.

In 1999, Slovakia had to deal with 1.7 million tonnes of municipal waste. Some 51 % of that amount was household waste, 20 % consisted of cesspool waste, 8.6 % out of bulky waste. Some 6.5 % of all the municipal waste was recycled. Composting was much more important than the generation of secondary raw material. Some 66 % was disposed of in landfills, 10 % was incinerated.

The Slovak Republic makes huge effort to collect household waste containing harmful substances separately. In 1999, 718.6 tonnes were collected and more than half of that amount was recycled. For medical waste, the inhabitants find special containers at every chemist's. The recovery of waste paper has doubled from 1993 to 1999. Slovakia even imports waste paper in order to be recycled.

Waste management planning and strategy

Waste management strategy

In 1993, Slovakia was one of the first central and east European countries to adopt a national waste management programme. Already in 1996, 159 regional waste management plans which involve more than 12000 waste generators, were elaborated.

The strategy of the national programme is based on the following priorities:

- waste minimisation;
- reduction of toxic substances;
- waste recovery;
- thermal waste treatment for energy profit, waste volume reduction and reduction of hazardous substances;
- landfilling.

One of the programme's aims is to create economic instruments supporting cleaner technology, waste recovery and the design of recycling-friendly products. Packaging waste that cannot be recycled, should be minimised. If recycling is not possible, hazardous waste must undergo a treatment before its disposal. The measures of the programme have to be implemented in three steps: from 1994 to 1997, from 1997 to 2000, and from 2000 to 2005.

The first evaluation of the implementation of measures was drawn up in 1996. It concluded that there had been a significant improvement in waste minimisation, the construction of new regional landfills, separated municipal waste collection, the construction of recycling plants, and the disposal of municipal waste into landfills approved by the environmental authorities.

There had been partial improvement in environmental education and PR, the correct disposal of some groups of waste (e. g. PCB), the certification of plants for waste disposal, and the redevelopment of old environmental burdens. Still unsolved problems were the recovery of biological waste, the reconstruction of waste incinerating plants, and the construction of hazardous waste incineration plants.

For the period from 1997 to 2000, the programme envisaged, for example, the construction of a landfill for hazardous waste and at least one supra-regional hazardous waste incinerating plant, the use of the cement production for the disposal of some kinds of waste, the increase of the share of composted waste, and the disposal of all municipal waste in landfills meeting technical conditions.

(1) 'Environment of the Slovak Republic', Ministry of the Environment of the Slovak Republic, Bratislava, 2000.
(2) 'Waste management policies in central and east European countries: Current policies and trends, DHV CR Ltd, Prague, 2001.
(3) 'Environment of the Slovak Republic', Ministry of the Environment of the Slovak Republic, Bratislava, 2000.

For the years 2000 to 2005, the programme plans the disposal of all hazardous and medical waste in appropriate facilities, the support of composting by economic instruments, the opening of a plant for construction waste disposal, and the redevelopment of landfills endangering the environment.

One of the principles of the Slovak Republic's waste policy is the financial responsibility of waste generating industries. Already in Czechoslovakia, an Environmental Fund had been established in 1991. In 1998, the Slovak Republic adopted a new act about the "State Environmental Fund, the purpose of which shall be to raise, allocate and provide financial resources and their proper use in environmental protection." There is also a Recycling Fund, to which producers of selected recyclable products have to contribute.

The new Act on Wastes regulates the problem of old vehicles in its paragraphs 46 to 51. Manufacturers must build vehicles out of materials and components that can be recycled or reused and provide information on their disassembly after use. The manufacturer also has to list the locations of all hazardous substances in the vehicle. Merchants are obliged to pay SKK 5000 into the Recycling Fund for every vehicle they sell. The holder of an old vehicle is obliged to return it to the manufacturer or to hand it to an authorized processor, who has to issue a confirmation of acceptance and is not allowed to request a charge. On the contrary, he has to pay the old vehicle holder SKK 2000. Old vehicle processors must use the best accessible technologies and keep an operation documentation.

Expenditure

In 1999, the State Environmental Fund had a revenue of SKK 7 million out of penalties concerning waste management. SKK 80000 of this amount were spent on waste projects. Taxes for waste disposal amounted to SKK 102 million [(1)].

Legal and institutional framework

Legislation

There was already under Czechoslovakian law, the Waste Act No 238 and subsequently the Act of the Slovak Council No 494 on State Administration of Waste Management, which came into effect in 1991. Although they had been applied successfully for years, it became necessary to proceed to a new regulation. Two important reasons were the requirement for adjustment of waste export and import to OECD regulations and the conformity to EU regulations. Another topic to be included in the law was the problem of old vehicle treatment. In 2001, the new "Act on Wastes and on Amendments and Supplements to some Acts" entered into effect.

In the same year, the Ministry of the Environment adopted an "Order implementing certain Provisions of the Act on Wastes". It regulates details of the contents of waste management plans, the methods of keeping and maintaining waste records, the way of marking batteries and accumulators and requirements regarding waste handling facilities.

In 2001 the Ministry of the Environment issued the Decree No 284/2001 Coll., which introduced a new waste catalogue identical to the European waste catalogue. Before, the Slovak Republic's legislation distinguished three waste categories: other (o), special (s) and hazardous (h) waste. Now the waste is classified as either hazardous (h) or non-hazardous (nh).

Another step towards European legislation shall be the passage of the Act on Packages and Package, Waste, which was in governmental discussion in 2001. The last step to reach full accord with the EU legislation will be a 'bill amending and modifying the Act on Waste' which is submitted to governmental discussion in 2002.

The Slovak Republic has signed the Basel Convention and has taken over the relevant lists of waste for import, export and transit from EU regulations. In 1997, a Regional Training Centre for the Implementation of the Basel Convention to central and eastern Europe was founded under the roof of the SEA.

The Slovak Republic follows the directive for approximation of legislation towards the environmental legislation of the EU.

The definitions and principles of hazardous waste management laid down by Council Directive 91/689/EEC on hazardous waste have been transposed into the new Waste Act.

Institutional Framework

The Slovak Environmental Agency (SEA) runs the Centre of Waste Management in Bratislava. The SEA evaluates the latest information about best available technologies in the world and consults administrative bodies and waste generators. It has established a Hazardous Waste Information Centre. It is in charge of the partial waste monitoring system (PWMS-WASTE) and the regional waste information system (RISO). It is responsible for the national reference laboratory for waste analysis and a member of the Expert Commission for the Waste Catalogue. It runs the Secretariat of the Regional Centre to the Basel Convention for the central and east European region. Its experts give training concerning waste not only at the national level, but also for other CEE countries.

The Slovak Statistical Office carries out regular surveys on waste and environmental expenditures.

The duties of the Ministry of the Environment of the Slovak Republic are fixed in Section 65 of the Act on Wastes. For example, it has to work out the national waste management programme and administer the register of waste transport across the border.

The Inspectorate is the body of State supervision in waste management. It imposes fines.

The regional offices issue the regional waste management programmes, decide on waste ranking and keep records of transport documents on hazardous wastes.

From 1991 to 1996, 38 district environment offices and 121 local environment offices have been founded. The district offices approve the programmes of local waste producers. They specify duties to separate hazardous waste and deal with offences.

Legal waste information requests

The statistical survey on waste is based on the concepts of monitoring environment of Slovakia, approved by the Government Resolution No 449/1992.

(1) Environment of the Slovak Republic, loc. cit.

The Statistical Office carries out two annual surveys on waste, which are based on laws on State statistics. One of them is about waste in general. It distinguishes between special, hazardous and other wastes. Reporting units are enterprises with 20 or more employees, which are asked about the waste amount in specified categories and the way it is handled. The questionnaire differentiates between energy recovery, utilisation as a secondary raw material, landfilling, incineration and other ways of handling.

The other survey is focused on municipal waste. Reporting units are the cities and communes of the Slovak Republic. The municipalities must provide data about the generation of household waste, other waste similar to household waste, bulky waste from households and from municipalities, septic and cesspool waste, street sweepings, greenery waste and separately sorted hazardous waste from households. The towns and communes must also answer which amounts of waste are utilised, disposed of or treated in another way. The questionnaire contains a module about separate collection of paper, glass, textile, plastics, metals, bio waste, hazardous substances and others, but this is not obligatory.

For both questionnaires, the national waste catalogue was used until the year 2001. The reporting forms for 2002 are according to the European waste catalogue. The data will also be processed by new software.

According to Section 49 of the Act on Wastes and Decree No 283/2001 Coll., processors of old vehicles, used batteries and accumulators, waste oils, used tyres, wastes from multi-layer combined materials, electronic scrap, plastic waste (PE, PP, PET, PVC), waste from fluorescent tubes containing mercury, waste paper and waste glass must notify the respective district office and the Recycling Fund quarterly of their recorded data.

The same decree obliges waste holders to submit hazardous waste reports in case they handle more than 50 kg of hazardous waste or one tonne of non-hazardous waste per year.

Regions and districts are obliged to submit data about waste flows in the binding parts of their waste management programmes. This new regulation will lead to a significant expansion of monitoring waste generation, especially on biodegradable waste.

Waste information collection

The Slovak waste information system, existing since 1998, is a subsystem of the Slovak environmental information system. In the year 2000, the new regional waste information system (RISO 2000) was established. It collects data about waste generation, recovery, collection, treatment and disposal. It contains detailed information on processing and disposal facilities and a database on transboundary movements. The public is given free access to the information. Because of the new legislation, a new version (RWIS-NET) had to be tested in 2001. RWIS-NET allows the presentation and visualisation of selected phenomena in digital maps or in the required, exactly defined data structure.

International reporting

Slovakia replies to the joint OECD/Eurostat questionnaire on waste.

The Basel Convention has been applied since 1992.

The Slovak Republic delivers waste data to Eurostat in accordance to the Council regulation on waste management statistics and reporting obligation.

Selection of documents

- 'Slovak Republic waste management till 2000 programme', Ministry of the Environment of the Slovak Republic, 1996.
- National Council of the Slovak Republic: government bill - Act on Wastes and on Amendments and Supplements to some Acts, 2000.
- Slovak Environmental Agency, Centre of Waste and Environmental Management, Bratislava-Dubravka.
- 'Environment of the Slovak Republic', Ministry of the Environment of the Slovak Republic, Bratislava, 2000.
- Statistical Office: Odpady v Slovenskej republike, Bratislava, 2000.
- '2001 regular report of Slovakia's progress towards accession', European Commission, Brussels, 2001.
- 'Waste management policies in central and east European countries: Current policies and trends', DHV CR Ltd, Prague, 2001.

Institutions and contacts

Institutions	Contacts
Slovak Environmental Agency	www.sazp.sk
Statistical Office of Slovak Republic	www.statistics.sk
Ministry of the Environment	www.lifeenv.gov.sk/minis/

Slovenia

Basic information waste management

In 1995, 850000 tonnes of municipal waste were generated (solid waste, similar waste from economy and crafts sectors, and used cars). The share of settlements covered by public waste removal services was 74%, whereas the share of the population served was 84%. The generally established method of waste management in Slovenia is its removal from the location of generation and disposal on more or less adequate landfills. Almost all municipal waste ends in so called municipal landfills, illegal dumpsites, and in car disposal sites.

There are 53 landfills in Slovenia in operation where mostly municipal waste is disposed of (inventorisation of landfills in the Republic of Slovenia, 1995), and 13 landfills for waste deriving from industry and mining (strategic guidelines of the Republic of Slovenia for waste management, Poroevalec, No 36/96). The majority of municipal landfills will have to close their operations by the year 2000 since their capacities will be full. Only 12 municipal landfills have capacities sufficient for 10 or more years. Four municipal landfills can extend the period of their operation by 10-20 years if they expand on neighbouring land, while in some cases operation can be extended even by as much as 50 years (1).

The collection of certain secondary raw materials has a relatively long tradition and has been quite successful. However, with the loss of the former Yugoslav markets the trade in secondary raw materials decreased (the 1994/89 index is 65). 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.

The separate collection of certain types of urban waste at the source is still in the initial phase, recycling of collected waste is minimal, and there are no facilities for the use of the energy potential of municipal waste.

The most established way of handling industrial waste and waste generated in the energy sector is deposition on monolandfills and storing in the premises of companies. Nevertheless, well-established methods of recycling and fixation of hazardous substances are used in handling certain types of hazardous waste.

A certain portion of waste from production processes also ends on municipal landfills. Due to a construction boom amounts of construction waste reached a quarter of all waste generated in Slovenia.

In 1996, 13992 m³ and 19221 tonnes of hazardous waste were generated in Slovenia. Some 5543 tonnes of hazardous waste were imported into Slovenia and 21406 tonnes were exported from Slovenia in 1996. The export of specific types of hazardous waste (e.g. waste paints, varnishes, solvents, etc.) in accordance with the procedures of the Basel Convention is for many industrial branches the only option. Some companies have their own incineration facilities which are used in their technological processes. Owing to the public opposition, waste is rarely incinerated in industrial facilities, although there are many environmentally sound possibilities for that (e.g. cement kilns). Slovenia has no facility for the final disposal of hazardous waste.

The collection and sorting of hazardous components mixed with urban waste (car and other batteries, waste pesticides, waste paints and organic solvents, discarded medicines, etc.) has just begun. The system for managing collected materials until they are destroyed or recycled has not yet been set up (2).

According to available sources the amount of exported waste is increasing. Hazardous waste is exported mainly to Austria, France and Italy (3). Import of hazardous waste is constant, only lead ash and lead batteries were imported in 1995 and 1996.

Waste management planning and strategy

Waste management strategy

In 1996, the Government prepared and adopted a document on waste management strategy. The waste management strategy of the Republic of Slovenia (which is a constituent part of the national environmental action programme) (4) defines basic guidelines and objectives in the field of waste management. In the strategy, economic development and the process of integration into the European Union are taken into account. It was elaborated on the basis of an extensive study on waste generation and management in Slovenia which was carried out in 1995. The study presented some aspects of waste management and types of waste that remained unidentified in the past.

One of the main characteristics of the strategy is that strategic principles of the European Union regarding waste management (EU environment and sustainable development policy and action programme OJ C 138, 17.5.1993, p. 1) have been adopted in Slovenia, while at the same time basic principles from the Environmental Protection Act relating to waste issues in the framework of the complexity and interconnection of environmental protection elements were implemented.

The inevitable integral part of the implementation of the waste management technical plans is waste management in optimally closed systems. Besides, definition of key measures is foreseen as well as legislation with an emphasis on harmonisation with EU regulations.

The most important measures of the waste management strategy, closely related to harmonised measures in numerous fields, include:

- the adoption of a contemporary legislation including all the related implementing regulations, which will ensure waste management conditions comparable to those in the EU. The regulations will have to stipulate packaging waste management;

(1) 'Environment in Slovenia 1996', (State of the environment report, prepared according to para. 75. and 76. of the Environmental Protection Act), Ljubljana, 1998.
(2) 'National environmental action programme', Ministry of the Environment and Spatial Planning, Administration for the Protection of Nature, Ljubljana, 1999.
(3) 'Waste management policies in central and east European countries', DHV CR Ltd, Prague, 2001.
(4) 'Waste management strategy of the Republic of Slovenia: Problems and specific issues in approximation to the EU' - Strateške usmeritve Republike Slovenije za ravnanje z odpadki: Problemi in specificnost pri približevanju Evropi, EPA, 1995/1996.

- the provision of organisational and technical/spatial conditions in order to apply solutions (drawing-up of waste management programmes and ordinances at the local community level, preparation of investment programmes, spatial planning documents, etc.);
- the consistent fulfilment of obligations arising from international and bilateral agreements (Basel Convention);
- the setting-up of an information system concerning wastes and facilities and plants for the treatment and final disposal of wastes;
- the application of proposed solutions will mostly be based on economic instruments, which will promote waste minimisation at the source and the provision of material conditions for the operation of the envisaged system;
- in addition to economic instruments, the waste management will focus on establishing links between waste generators/holders and persons disposing of waste;
- because of the sensitivity of the problem and the pronounced NIMBY effect, special attention will have to be devoted to continuous informing, education and development with the view to gradually heightening the awareness of the entire population.

Expenditure

The estimated costs of the implementation of the national environmental action programme measures are SIT 263.51 billion. This estimate takes into account only measures planned in the NEAP for the next five years. It is expected that nearly 85 % of the funds earmarked for the implementation of the measures will be needed in the fields of water protection and waste management; 11 % in the field of air protection; almost 4 % for the conservation of biodiversity; and less than 1 % for other fields. The main source of the funds will be the public sector, which is expected to cover 77 % of the total cost. The rest will be covered by the private sector.

The planned implementation costs are highest in the field of water protection and waste management, therefore water pollution and waste disposal tax will be an important financial resource for the construction of infrastructure. The taxes will be introduced in January 2000.

In the initial period it is reasonable to expect that more budget funds will be needed. Later on, the tax on waste disposal will become an important source of funds for investment projects.

User charges on municipal waste services range between EUR 19 to 75 per tonne, 8 % VAT included. In total the EU approximation costs in the waste management sector are estimated to amount to EUR 540 -808 per capita [(1)].

Legal and institutional framework

Legislation

The area of waste is regulated by:

- Environmental Protection Act, (Zakon o varstvu okolja, Ur. List RS št. 32/93, 44/95 - odlocba US, 1/96, 9/99 - odlocba US, 56/99 - ZON in 22/00 - ZJS);
- Rules on special waste management, (Pravilnik o ravnanju z odpadki, Ur. List RS št. 84/98 in spremembe in dopolnitve št. 45/00) - pursuant to the second paragraph of Article 30 of the Environmental Protection Act;
- Law on Public Management Services (OJ RS, No 32/93);
- Decree on Export, Import and Transit of Waste (OJ RS, No 39/96; 59/98);
- Order on the management of separately collected fractions;
- Rules on the landfill of waste (Pravilnil o odlaganju odpadkov, Ur. List RS, st. 5/00);
- National Statistics Act (OJ RS, No 45/95);
- National environmental action programme (NEAP) - pursuant to Article 47 and in accordance with Article 104 of the Environmental Protection Act - released September 1999;
- National programme on statistical surveys (OJ RS No 70/97) elaborated annually by Statistical Office of Slovenia (SO-Slovenia) and adopted by government.

As regards waste, a number of measures concerning the disposal of PCBs and PCTs, the labelling of batteries, cross-border movements of waste and waste from the titanium industry have been adopted. The directive on the landfill of waste has been transposed. Decrees on packaging, packaging waste and batteries have entered into force in November 2000, as well as codes of practice in these sectors [(2)].

Amendments to the decree on export, import and transit of waste, and to the price list of public services for handling nuclear waste were adopted in October 2000 and in November 2000 respectively. Books of rules for packaging and packaging waste and for handling batteries and accumulators containing dangerous substances were also adopted in November 2000 [(3)].

Alignment with the EC environmental acquis is well advanced in Slovenia. Slovenia's legislation is almost entirely aligned with the acquis in the fields of horizontal legislation and waste management. In the waste sector, nearly complete transposition of the acquis has been achieved. Slovenia also has a well-developed waste management system in place. Although implementation of the waste framework requirements is well advanced, this is a sector in which particular efforts are needed.

Institutional framework

The Ministry of the Environment and Spatial Planning (MESP) is the key competent authority for the waste management sector and responsible for municipal waste policy [(4)] (legislation) and planning on national level. The Ministry of Health has a consultative and monitoring role with the Shipment of Waste Directive.

The National Protection Administration of the Republic of Slovenia (NPA) and local authorities are responsible for preparing strategies and plans and issuing environmental permits. The NPA and enterprises themselves undertake monitoring. The NPA collects information and keeps a register on waste managing of enterprises and institutions on national level.

(1) 'Waste management policies in central and east European countries', DHV CR Ltd, Prague, 2001.
(2) http://europa.eu.int/scadplus/leg/en/lvb/e15110.htm
(3) 'Regular report on Slovenia's progress towards accession', European Commission, SEC(2001) 1755.
(4) The industrial waste policy is not under the responsibility of the Ministry of the Environment.

The Inspectorate for the Environment and Spatial Planning (IRSEP) and local authorities are responsible for the inspection and supervision of the implementation of regulation in the area of waste management.

The Statistical Office carries out a three-yearly survey on public waste removal and public landfill sites (KOOP-1) - the next survey will be carried out in 2002 for the year 2001, and on industrial waste generation (ODP-1) - the next survey will be carried out also in 2002 for the year 2001.

The administrative capacity in the environmental area has been improved. The Environmental Agency of the Republic of Slovenia was established in April 2001. It has overall responsibility at the national level for the implementation of the acquis in the field of environment. Some existing institutions, namely the Nature Protection Authority, the Hydro-meteorological Institute, and the Administration for Geophysics have been absorbed into the agency. It functions as the competent authority and has licensing and enforcement powers under environmental directives.

Special training has been provided to adequately implement the legislative requirements of the environmental impact assessment legislation. The number of staff dealing with EU issues, in particular in the field of waste management, water quality and inspection, increased by nearly 50 % in the last year [(1)].

As regards administrative capacity, most of the necessary institutions in the area of environment are in place, but the competent authorities for various directives remain to be identified. The overall administrative capacity has been steadily improved and the establishment of the Environmental Agency represents a breakthrough. However, the local capacity to implement EC environmental directives needs to be strengthened.

Legal waste information requests

According to Article 42 of RWM (rules on waste management) all waste generators, collectors, processors, disposers and carriers, which have to provide record sheets and to keep records following the Articles 19-41, are obliged to fulfil the obligations starting 1 January 1999.

RWM Article 19 determines that a waste generator (source of waste) generating more than 150 tons of waste or more than 200 kg of hazardous waste per annum have to establish a waste management plan covering a period of five years [(2)].

Articles 20/21 regulate shipments and imports of waste. Each activity of this type needs as an attachment a record sheet on waste managementas an attachment. The form for this record sheet is laid down in RWM ANNEX 6.

Articles 22 and 23 specify that waste generators must keep a record (Article 22) [(3)] and that waste generators, which are generating more than 80 tonnes of waste or more than 20 kg of hazardous waste have to submit a report to the ministry on generation and management (Article 23).

Similar rules for record keeping and submitting information to the ministry are fixed in Articles 26 (waste collectors), 32, 33 (waste processors and disposers) and 35 (waste carriers).

Furthermore, the ministry has to keep a record (register) of waste processors and disposers (Article 37) and of collectors, providers and carriers (Article 38).

In the RWM Annnexes 6 and 7, the forms are defined. Annex 6 fixes the waste management record sheet and Annex 7 the sheets for the reporting on generation and/or collection of wastes (7A) and processing and/or disposal of wastes (7B).

The rules fixed in RWM and mentioned in the chapter above are not valid for municipal waste collectors.

The management of separately collected fractions of waste (including packaging waste) will be regulated by a legal order on "the management of separately collected fractions" which should be adopted in April 2001.

The operators of local public services have to submit annually (until end of March for the year before) a report on the management of separately collected fractions of municipal waste.

The operation (collection and landfilling) of mixed municipal waste is nearly totally under legislation, inspection and supervision of local authorities. For landfills there exist rules on national level.

In Annexes 1 and 2 of the rules on waste management the EWC including the hazardous waste list are integrated. The application of EWC has been therefore obligatory since December 1999 for the supervision and statistics. The Commission Decision 2000/532/EC on a new integrated EWC will be adopted in April 2001.

Waste information collection

Statistical Office Slovenia is presently carrying out two surveys on waste:

- survey on public waste removal and public landfill sites (KOOP-1);
- survey on waste from economic activities (ODP-1).

Both surveys have a three-yearly periodicity and were firstly carried out for the reference year 1995. Information for the year 2001 will be available at the end of 2002.

Both surveys will be changed considerably by content and periodicity for the next reporting period.

KOOP-1:Survey on public waste removal and public landfill sites ( ) [(4)]

The "old" survey on municipal waste consists of three tables. It was sent out in April 2002 for the last time to the surveying units for the reference year 2001. Data will be available around the end of 2002. Reporting units are "municipal waste collectors". These waste collectors are up to now exclusively public services. They are under special control of local authorities and excluded

(1) 'Regular report on Slovenia's progress towards accession', European Commission, SEC(2001) 1755.
(2) Generation of waste and the expected trends of its generation; existing and planned technical, organisational or other measures for the preventing and reducing the generation of hazard level of waste; existing and planned methods of management of generated waste; processing or disposal of generated waste which they carry out on their own or intend to carry out on their own; their existing and planned facilities and plants for waste disposal.
(3) This record should contain information on waste generated, stored, submitted to a collector, processed or disposed on their own and submitted to waste treatment. The documentation has to be done for each calendar year and be kept for a minimum of five years.
(4) The survey is related to municipal waste. All information on municipal waste is derived from the results of this survey.

from the rules of waste management [1] under which all remaining waste management enterprises have to operate.

The questionnaires KOOP-1 for the year 1998 was sent out to all municipal waste collectors operating in Slovenia (62 units). These waste collectors are mostly in addition also operators of 'public landfills' [2]. This speciality of municipal waste management is considered in the old questionnaire in such a way that the questions are not only referring to collection, but also to disposal (landfilling) of municipal waste. If ownership and company structure of municipal waste management is changing in the future by privatisation and/or separation of different activities such a questionnaire structure will no longer lead to sufficient results.

Municipal waste

Survey on public waste removal and public landfill sites ('old'-KOOP-1)

Tab	Topics	Waste type breakdown
Table1	Municipal waste quantities collected from municipalities and carried away to the different landfills	Total municipal waste and splitting up 'household', 'bulky' and 'others'
Table2	Quantities brought to public landfills	'Municipal waste', 'separately collected fractions' and 'non-municipal (non-dangerous)
Table3	Municipal waste treatment differentiated by broad recovery and disposal types [a]	No breakdown

(a) The breakdown of waste treatment facilities corresponds to the breakdown in Table 5c of the JQ. Recovery is differentiated into 'recycling', 'composting', 'incineration with energy recovery' and 'other'. Disposal is differentiated into 'final treatment' and 'final disposal'.

The KOOP-1 survey aims to gather data on public collection especially on mixed municipal waste but also on separate collection activities and further handling (treatment) of municipal waste by municipalities.

- Additional information on the composition of municipal waste will be provided by the Ministry of the Environment and Physical Planning based on proper estimation.
- Data on landfill sites capacities are available from the landfill sites inventory list made on behalf of the same ministry.

ODP-1:Survey on waste generated from economic acitivities

The ODP-1 survey is collecting data on the type and the amount of waste generated by enterprises along their business operations. In addition to "pure" generation also waste collection, reception (overtake), recovery, recycling (re-utilisation), disposal and handing over to other enterprises are questioned in this survey. The table below gives a more detailed overview on this survey.

Waste generation by economic activities

Survey on waste from economic activities (ODP-1)

Units	Coverage	Variables	Waste classification	Threshold and periodicity
Waste generators	All enterprises belonging to the NACE groups: C, D, E, F, G, H, I, K, M, N and O excluded: A, B, J, L, P and Q	Type and amount of waste generated	"Old' EWC was utilised for the 1998 survey and the current one for the 2001 survey	From 2002 onwards annual surveywith threshold:10 employees or more
Waste collectors		Type and amount of waste collected		
Waste recovery operators		Type and amount of waste received for recovery		
Waste disposal operators		Type and amount of waste received for disposal		

Additional information collection

According to the rules of waste management the Environment Administration for the Protection of Nature in Slovenia has to keep a register of the enterprises operating under permits and has to collect the waste management record sheets and, in addition, annual reports on generation, collection, processing and disposal of waste.

Results of these nearly permanent data collection activities are presented in the publications of the ministry. Up to now both information chains, either with regard to statistical information collection or with regard to "administrative" data collection are in the process of establishment and fine tuning. Systematic comparisons between the results of two information chains were

(1) OJ 84/98 and amendments 45/00, 20/01; additional 'Order on the management of separately collected fractions in the public service of urban waste management' (OJ 21/01) was released in 2001.
(2) Slovenia is differentiating, up to now, between three types of landfills: public, inert and industrial landfills. For hazardous waste, there is one landfill.

not elaborated and the co-ordination will now be done in the future in an intensive way.

Statistical Office Slovenia is prepared to improve its information collection in explicit agreement with the Ministry of the Environment and the Environment Agency. The procedure is before all not formally but technically restricted. For reaching the improvement for the reference year 2002 the time limit for questionnaire adaptation must be the third quarter of the year 2002 to reach all adjustments for all phases of the process (questionnaire design and print, data input, data control, data processing, data output, etc.).

International reporting

Slovenia reports and replies on:

- its imports and exports of hazardous waste to the Secretariat of the Basel Convention;
- the joint OECD/Eurostat questionnaire on waste since 1995. Data are available up to now for the years 1995 and 1998. At the end of 2002.

Selection of documents

- 'Statistical yearbook 2000' (Chapter 32 on the environment), Statistical Office of the Republic of Slovenia.
- 'National environmental action programme', Ministry of the Environment and Spatial Planning, Ljubljana, September 1999.
- 'Environment in Slovenia 1996', Ministry of the Environment and Physical Planning - Nature Protection Authority, Ljubljana, 1998.
- 'Rules on waste management' (pursuant to the second paragraph of Article 30 of the Environmental Protection Act), Ministry of the Environment and Physical Planning.
- 'Rapid report on public waste removal and municipal landfill sites, 1995', Statistical Office of the Republic of Slovenia, October 1998.

Questionnaires from SO-Slovenia on:

- municipal waste (KOOP-1);
- industrial waste (ODP-1).

Institutions and contacts

Institution	Contact
The Republic of Slovenia	www.sigov.si/
The Statistical Office of the Republic of Slovenia	

Cyprus

Basic information waste management [1]

Data on waste arisings is based on surveys carried out by an external consultancy [2] in 1993, and subsequent supplementary surveys (more recent data is not available at present). Three districts were included in the survey, and analyses in order to determine quantity, composition, and density of the waste were carried out. Two further district municipalities provided information which was used directly in the surveys.

In total, 368800 tonnes of municipal waste were generated, of which 281400 tonnes were in residential areas, 26000 in tourists areas and 61400 in other areas. These figures include waste from households, commercial premises, hotels and restaurants.

The main tourist influx occurs between May and September, which has implications for municipal waste production. However, there is not as clear a link as might be expected. Residential areas produce 68 % of the waste, while only 7 % is produced in tourist areas. The Carl Bro study found that the average per capita production is approximately 470 kg/year for residential areas, and approximately 670 kg/'tourist year' for tourist areas.

The survey result shows organic matter to be the single most important component of municipal waste. It accounts for one fifth of the total waste. Together with garden waste, biodegradable waste constitutes more than one third of the total waste arising. Paper and cardboard constitute another quarter.

The municipalities are responsible for the collection of waste in their own areas. As part of this system, they also own and maintain the collection equipment. The waste is collected from the kerbside between two and six times per week (depending on the time of year). The waste has to be collected frequently due to the lack of bulk storage containers. Municipal waste is generally not segregated prior to collection, and recycling activities are few.

There is some recycling of aluminium cans (about 1500 tonnes per annum), paper and cardboard (about 4000 tonnes per annum), all of which is baled and exported, except for paper/cardboard waste products from printing works which are recycled domestically. Glass beverage bottles of local origin are recycled through a deposit system, other glass containers are not recycled. At present, there are no manufacturers which operate using only recycled materials. However that is not to say that there is no capacity for recycling. For example, in Limassol, a company currently uses about 1000-1500 tonnes of paper/cardboard per annum which is baled and exported. Also, it is possible that plastics manufacturers could use post-consumer products after grading and pelleting. It is highly likely that such plants already recycle production waste internally.

Most municipal waste is disposed of via landfill. There are five landfill sites operating at present. No other treatment facilities exist. In the rural areas, waste is often disposed of locally. The landfills are owned, run and maintained by the municipalities. However they serve more than the local area, with 75 % of the population of the government-controlled area being served by the five landfills. The landfills have no system for control or registration, and no registration of the waste hauliers and other producers of waste. This means that there is no data on waste quantities and composition.

The landfills are also not constructed according to present high standards, for example they have no facilities for leachate collection. No municipal waste incinerator exists in the Republic of Cyprus at present.

In total, approximately 345000 tons of hazardous waste were generated in 1993/94, of which about 8000 tonnes were solid. Specifically, the largest quantities of effluents containing hazardous compounds were generated at the bleaching and dyeing plants, tanneries and at metal plating and aluminium anodising plants, whereas solid hazardous waste, such as contaminated packaging, ashes and sludge, were generated at pesticides manufacturing plants, hospitals and at bleaching and dyeing plants. Household generation of hazardous waste was equivalent to approximately 1.5 kg per inhabitant per year, consisting mainly of pesticides and flammable solvents, with car batteries, mercury and cadmium batteries, electrical equipment, thermometers, etc.

Since this study was undertaken in 1993, a number of industries have installed their own treatment plants. In addition, a communal plant has been put into operation in the Limassol district, and more recently, a new plant started operating outside Nicosia, treating industrial waste originating from the Nicosia and Larnaca industries. Much of the waste treated in these two plants falls within the hazardous waste total identified by the 1993 study. As a result of actions taken since 1993, the hazardous waste remaining to be treated is currently estimated at around 2500 tonnes per year, most of which is solid waste which goes to landfill, or waste which requires incineration.

Waste management planning and strategy

Waste management strategy [3]

Cyprus has no national waste management strategy, although a contract with foreign consultants to produce such a strategy is understood to be imminent. Further, there is no detailed plan for the management of hazardous wastes, although specific studies have been carried out. In addition, the proper organisation and sound management of municipal waste is not yet clearly defined, and the requirements for the upgrading of existing landfills have not yet been assessed. This can be expected to require significant investment in new landfills and in upgrading existing sites, together with investment in appropriate pre-treatment and composting plants in order to secure full compliance with the landfill directive. However, the Council of Ministers has already approved a relevant programme, and tenders for the design of a new sanitary landfill for the Paphos district are currently being reviewed.

Permitting, site level monitoring and inspection/enforcement in the waste sector are all likely to pose major problems for the

(1) This section is based on: 'Compliance costing for approximation in Cyprus', Metroeconomica Ltd, study for DG (Environment) XI.A.4 B-24, European Commission, 1999.

(2) 'Recycling of municipal solid waste in the main urban and tourist centres of Cyprus', Carl Bro Environmental in association with NV Consultants, prepared for the Ministry of the Interior, 1994.

(3) 'Implementation and enforcement capacities in Cyprus', Ecotec Research and Consulting Ltd in association with the IEEP and WSA EnviroQuality Engineering Consultants Ltd, sub-study, final report to the Environment DG, European Commission, 2001.

Cypriot government. The key issue is that very few (if any) of the existing landfill sites are properly permitted, let alone monitored and inspected. While the Environment Service does undoubtedly has the expertise to carry out these tasks, it simply does not have the resources (manpower or equipment) to do this on the scale that will be needed once the new Waste Act comes into effect. There are also issues regarding waste data in Cyprus, with more accurate information being needed in order to demonstrate compliance (e.g. with requirements for increased recycling/ recovery rates).

Expenditure

Waste services charges are paid by households, commercial and industrial premises directly to municipalities. The level of charges relates to the type of property. Each municipality however, is free to set the magnitude of the charge, and tends to recover more than the costs of services provided.

A study to estimate the capital (non-recurring) and recurring costs associated with Cyprus complying, by piece or category of legislation as far as this is possible, with the main EU environmental legislation was carried out. According to this study the total annual costs range from EUR 13.1 to 26.3 million [(1)].

Legal and institutional framework

Legislation

A bill on waste management is in preparation and is expected to be completed by June 2001 and enacted towards the end of 2002. It will include subsidiary legislation and is intended to secure full transposition of the waste framework directive and other key directives. These include the landfill directive, the hazardous waste directive and directives relating to waste oils, PCBs/PCTs, batteries/accumulators, packaging/packaging waste and the use of sewage sludge in agriculture. The titanium dioxide directive will be implemented through amendments to the Water Pollution Control Law [(2)].

A number of other areas also require significant implementation effort. These include an inventory and decontamination programme (PCB/PCT directive) for the private sector. More than 500 transformers of the Electricity Authority of Cyprus have already been assessed, and tenders for a wider decontamination programme have already been submitted. A code of practice for sewage sludge disposal (use of sewage sludge in agriculture) has been prepared, and integrated management systems for batteries (batteries/accumulators) and for the recycling/recovery of packaging waste (packaging and packaging waste) will be implemented in accordance with terms of reference which have now been prepared. At present, the packaging waste directive is the only one in this sector for which a transitional period has been requested.

Legislative framework

Responsibilities within Cyprus are extremely complex for such a small country. Environmental policy is co-ordinated through the Ministry of Agriculture, Natural Resources and Environment (MANRE), although the Ministry of the Interior (MoI) and the Ministry of Labour and Social Security (MLSS) also play important roles.

Within MANRE, the key unit responsible for environmental issues is the Environment Service (ES), which plays a key coordinating role both with other parts of MANRE and between MANRE and other ministries. As well as this coordinating role, MANRE has a wide range of more specific responsibilities in fields such as environmental impact assessments, the laws on water pollution and waste management, environmental awareness and training and international conventions.

Permitting and monitoring are currently dealt with on a 'media' basis, with responsibilities split mainly between the Department of Labour Inspection (air), the Environment Service (waste) and other MANRE departments (water) [(3)].

The responsibility for waste management rests primarily with MANRE's Environment Service (Ministry of Agriculture, Natural Resources and Environment). However, the Ministry of the Interior's Department of Town Planning and Housing has a role in relation to landfilling (primarily site selection) while the Department of Labour Inspectorate of MSSI has a role in relation to incineration (focusing on air pollution). MANRE's Department of Agriculture is also involved in the use of sewage sludge in agriculture. Again collaboration is facilitated by the relatively close formal and informal links between these agencies.

Outside MANRE, the Department of Town Planning and Housing of the Ministry of the Interior acts as planning authority outside the four main conurbations. The Planning Bureau of the Ministry of Finance plays a key role in allocating resources, including investment for the infrastructure needed to comply with the acquis. The Department of Labour Inspection of the Ministry of Labour and Social Insurance acts as the environmental inspectorate for industry.

Local authorities play only a very limited role in relation to the environment in Cyprus. There are 24 municipalities covering urban areas (but only 11 of these serve populations greater than 10000) and 352 Communities in the rural areas (average population around 750). Furthermore, these authorities were only established in 1985 and remain under-capitalised and under-resourced.

Under the Municipalities Law, the Municipalities are nominally responsible for a range of environmental services (water supply, sewerage and wastewater treatment, rainwater drainage, street cleaning, refuse collection and disposal, etc). In practice however, neither the municipalities nor the communities have the financial resources or the staff to discharge their environmental responsibilities effectively. It follows that responsibility for infrastructure investment required by the local authorities generally falls to central government [(4)].

(1) 'Approximation of environmental legislation: Role of compliance costing for approximation of EU environmental legislation in Cyprus', Metroeconomica Ltd, June 1999
(2) 'Implementation and enforcement capacities in Cyprus', Ecotec Research and Consulting Ltd in association with the IEEP and WSA EnviroQuality Engineering Consultants Ltd, sub-study, final report to the Environment DG, European Commission, 2001.
(3) 'Implementation and enforcement capacities in Cyprus', Ecotec Research and Consulting Ltd in association with the IEEP and WSA EnviroQuality Engineering Consultants Ltd, sub-study, final report to the Environment DG, European Commission, 2001.
(4) 'Environmental policy in the candidate countries', Ecotec Ltd, IEEP, FEI, Environment DG, European Commission, 2001.

International reporting

Cyprus is reporting to and replies on:

- the joint questionnaire of OECD/Eurostat;
- Basel Convention Secretariat.

Selection of documents

- Ecotec Ltd, IEEP, WSA EnviroQuality Engineering Consultants Ltd, 'Implementation and enforcement capacities in Cyprus, Environment DG, European Commission, 2001.
- Ecotec Ltd, IEEP, FEI, 'Environmental policy in the candidate countries', Environment DG, European Commission, 2001.
- Metroeconomica Ltd, 'Approximation of environmental legislation: Role of compliance costing for approximation of EU environmental legislation in Cyprus', June 1999.

Malta

Basic information waste management [1]

In 2000, the Maltese Islands produced around 1.5 million tonnes of waste, while the quantities are continuing to grow. The largest source of waste production was the construction and demolition branch with 1.2 million tonnes. Waste of this origin has risen by a yearly average of 15 % from 1997 to 2000. A similar large increase is evident where municipal waste is concerned. It increased by 12 % annually during the same four years. Hazardous waste only amounted to 10000 tonnes, half of which consisted of used oils. If waste arisings continue to grow at the present rate, the total amount of waste would more than double by 2010.

Currently most of the waste is disposed of untreated at the two landfill sites at Maghtab and Qortin. Incinerators are exclusively used for hospital waste, slaughterhouse waste and dry dock waste. Another incinerator works at the airport. Sea dumping is still an important method of waste disposal: 3500 tonnes of sewage sludge and dry dock blasting grit are discharged into the Mediterranean each year. At Sant Antnin, a compost plant treats 32000 tonnes of solid municipal waste annually. There is only one operating recycling facility at Maghtab, recovering metals, paper, clean source-separated plastics, and textiles on a small scale. The facility is still under development and not yet fully operational.

An important problem is the lack of recycling and disposal plants for hazardous waste. Appreciable quantities of PCBs/PCTs, spent lubricating oils, batteries, accumulators and asbestos-containing materials are in storage awaiting export or disposal. A recently constructed used oil storage and re-processing plant located at Valletta Harbour will be brought into full operation as soon as possible. Lead batteries are partly exported for recycling. Asbestos-containing insulation materials are stored in a depot; residues from asbestos cement construction material are landfilled.

In the year 2000, 53 % of Malta's municipal waste consisted of organic material, 2.6 % was metal, 0.4 % bulky waste. Some 85000 tonnes of beverage-related packaging materials were consumed in 1999, of which 87 % was reused with most of the remainder being landfilled.

The results of a household waste survey [2] in April 2002 showed that the average Maltese household generated 2.2 kg of waste each day. Food remains amounted to 59 % (by weight) of the total waste. Paper, cardboard and cartons were next in line, occupying an average of 7.5 % a piece of the family dustbin. Plastic containers and film, as well as textile material each constituted 5.0 % of the garbage, with glass bottles and ferrous cans going toward a further 4.0 % a piece. Hazardous waste made up an amount of only 0.04 %.

Separate collection of household waste only takes place in the test region of Pembroke, where a 'bring' system for glass, paper, cardboard, metal tins and plastic bottles has been introduced. The main problem is the lack of inland capacities for municipal waste recycling. In a test, glass was processed to be a part of construction material. Office paper was recycled to toilet paper. Malta's cardboard producers refuse to process used paper because of technical difficulties.

Dry cell batteries are collected separately from about 500 retail outlets, 160 schools and various offices. They are packaged in plastic drums for storage or landfilling.

Construction waste is disposed of in disused quarries, at landfills or dumped at sea. A high amount is dumped illegally, so that the figures of waste generation are probably underestimated. Soil from excavation work is deposited on agricultural land as indicated by the Department of Agriculture.

Waste management planning and strategy

Waste management strategy

The solid waste management strategy for the Maltese Islands was approved by the Government of Malta in October 2001. One of its key principles is producer responsibility. In particular, producers should arrange and pay the management of used packaging material, batteries and accumulators, mineral oils, consumer durable and electronic goods, excavation, construction and demolition waste, tyres and old vehicles. The Maltese Government prefers voluntary agreements with manufacturers; but if necessary, producer responsibility will be enforced by legal acts.

The government counts on economic tools in order to recycle or dispose of waste separately. For the end of 2002, it plans the introduction of deposit refund systems for selected hazardous and/or recyclable products. Financial incentives for locally manufactured recycled products shall help introduce them on the Maltese market.

The government intends to conduct a review and evaluation of financial barriers to the export of recycled products. Wherever justified and appropriate, it plans to reduce or remove the corresponding economic or other barriers.

It also intends to purchase preferably recycled or recyclable products and materials. This will apply initially to products and materials recovered from excavation, construction and demolition waste, recycled oils, and waste-derived compost products and will be implemented through a modification of the existing procurement policies of the government and all public sector institutions.

Another important task is the source segregation and separate collection of recyclable (including biodegradable) and hazardous materials from municipal waste. Before choosing a collection system, the government will consult closely with local councils and other stakeholders. The introduction of the system will be supported by an intensive public communications campaign and accompanied by a rationalisation of collection frequencies. Local councils will introduce a standard procedure to prove whether providers of collection services have the necessary technical capability and financial resources. Generally, municipal waste service providers will be supervised and controlled on a more professional basis in the future.

Because of the extension of composting, the landfilling of biodegradable waste (in comparison to 1995) shall be reduced to 75 % in 2010, to 50 % in 2013, and finally to 35 % in 2020.

(1) A solid waste management strategy for the Maltese Islands, Ministry of the Environment, Floriana, 2001.
(2) Household waste composition survey, News Release No 41/2002 of the National Statistics Office, Valletta.

As to the reduction of household waste, the government plans to encourage and promote home composting. Furthermore, it will install "bring centres" in car parks, recreation areas and near supermarkets for the delivery of the recyclable components of domestic waste. These centres have already been introduced on a trial basis with encouraging results. Priority will also be given to waste management issues in educational curricula and programmes. Malta intends to retain its non-alcoholic beverage regulations and, if possible, extend their scope to other types of containers.

In 2003, the government wants to set an end to the import and sale of batteries containing more than the permitted European limits of mercury, cadmium and lead. One year later, 50 % of all imported batteries is planned to be collected separately.

The arising of construction and demolition waste is to be reduced by 20 % in 2005. At the same time, 60 % of rock and stone, as well as 50 % of mixed inert waste shall be recycled. The principal tasks of a recently established Recycled Building Materials Working Party will be:

- to confirm or re-establish the reduction, recovery and recycling targets for this waste stream;
- to identify what materials from which specific wastes can be recovered, reused or recycled, and for which applications;
- to ensure that a regular supply of source segregated feedstock is kept;
- to consult the Waste Management Services Agency for the installation of a construction waste recycling plant;
- to encourage and provide means of research into recycling and recovery methods;
- to establish standards that permit the use of recycled products;
- to create awareness of recycled building products;
- to establish standards that permit the disposal of excavated rock into the sea.

Hospital and healthcare "risk wastes" shall be transported in appropriate containers and vehicles. At St Luke's Hospital, a waste decontamination and processing plant will replace the outdated incinerator. A similar treatment facility will be installed at the new hospital of Tal-Qroqq. Untreated slaughterhouse waste will be banned from landfilling in 2003. Landfilling of fish tissue from aquaculture will be prohibited from 2003 on.

The existing landfills at Maghtab and Qortin are to be closed and restored. A new landfill facility will be developed for the disposal of pre-treated non-inert, non-hazardous wastes. Likewise, the government intends to install a new secure landfill facility for certain hazardous wastes, e. g. fly ash from power plants. In both Malta and Gozo, inert waste landfills will be established. Non-inert waste from Gozo will have to be transported to Malta for treatment and disposal.

As none of the existing waste incinerators could be economically upgraded, all of them will be closed down as soon as alternative facilities are available. The only possible exception is the abattoir waste incinerator on Gozo. The Sant Antnin composting plant and the slaughterhouse waste treatment facility at Marsa will be upgraded. At Sant Antnin, additional processing facilities for dry recyclable materials and sewage sludge will be created.

Although the government prefers the treatment and disposal of waste as near as possible to the place of its generation, some hazardous wastes - i. e. PCBs, batteries and accumulators, end-of-life vehicles, consumer durable and electronic goods and used tyres will have to be exported. Facilities for their interim storage prior to shipment are planned to be installed in 2004.

Dumping at sea will be abolished in 2003 for fish tissue from aquaculture, in 2004 for sewage sludge and grit from ship repair and maintenance.

Expenditure

The operation and maintenance costs of the facilities foreseen in the "Solid Waste Management Strategy for the Maltese Islands" will amount to ca. Lm 8 million annually in the first years, increasing to a yearly amount of more than 13 million Lm by the end of 2023.

The Maltese Government considers it necessary to move progressively towards full cost recovery. This policy will be phased in over appropriate transitional periods.

Legal and institutional framework

Legislation

The new Environmental Protection Act came into force on 18 September 2001. Subsidiary regulations are being elaborated. The Act and Regulations will incorporate European requirements and establish an institutional structure for effective monitoring, inspection and enforcement.

The deposit of waste and rubble (fees) regulations (Legal Notice No 128 of 1997) require, inter alia, that waste must be disposed of in licensed sites. They also have introduced fees for waste disposal.

The waste management (batteries and accumulators) regulations provide that manufacturers and importers of batteries and accumulators must apply for a permit by the Malta Environment and Planning Authority. In the application they have to enclose a plan for the separate collection and management of spent batteries and accumulators. The competent authority may refuse to grant a permit if it is not satisfied with the submitted plan.

The waste management (waste oils) regulations of 2002 provide that all collectors and disposers of waste oils need a permit. The competent authority shall order regeneration whenever it is technically, economically and organisationally feasible. If the latter is not the case, the regulations foresee combustion under environmentally acceptable conditions. If both are not possible, the waste oils must be disposed of under such conditions that human health and the environment are safeguarded. In case the cost is not excessive, the best available technology is to be used.

Handlers of oils or other substances containing more than 50 ppm PCBs or PCTs must act according to the waste management (polychlorinated biphenyls and polychlorinated terphenyls) regulations of 2002. All substances or equipment containing PCBs must be decontaminated or disposed of as soon as possible, but no later than 31 December 2010. Incineration on ships and landfilling of PCBs are prohibited.

The sludge (use in agriculture) regulations of 2001 name the conditions for the use of sewage sludge in agriculture: the sludge must be treated and tested, and the soil has to undergo a chemical analysis. The annual rates of addition to land and the

concentration of heavy metals in soil shall not exceed specified limits. Sludge producers must prepare and maintain registers.

The waste management (landfill) regulations of 2002 define three classes of landfills: facilities for hazardous waste, for non-hazardous waste and for inert waste. The Malta Environment and Planning Authority shall, not later than 15 July 2003, set up a national strategy for the reduction of biodegradable waste going to landfill. This strategy shall include measures as recycling, composting, biogas production, material and energy recovery.

The waste management (incineration) regulations of 2001 set emission limits for waste incineration and co-incineration plants. The heat generated must be recovered as far as possible. Residues should be minimised and recycled. Incinerators have to ensure a minimum temperature of 850 ^{O}C for municipal waste and 1100 ^{O}C for hazardous waste.

According to the waste management (permit and control) regulations of 2001, the competent authority may order waste producers to submit a waste management plan. Every transport of hazardous waste must be accompanied by a consignment note.

The integrated pollution prevention and control regulations of 2002 prescribe that specified industries must take all appropriate measures to prevent pollution, avoid waste production, use energy efficiently and prevent accidents.

The waste from the titanium dioxide industry regulations (Legal Notice 223 of 2001) prohibit the discharge, dumping, storage, tipping and injection of the mentioned waste. They contain transition periods for old permits.

The prevention and reduction of environmental pollution by the asbestos regulations of 2001 demand that asbestos waste must be prevented at source. The transport and disposal methods must ensure that no fibres or dust are released into the air. If asbestos waste is landfilled, it must have been treated, packaged or covered in a way that the release of asbestos particles into the environment is prevented.

A Maltese speciality are the non-alcoholic beverages (control of containers) regulations, which require that a "carbonated ready-to-drink liquid or beverage which contains no more than two per centum of alcohol and which is flavoured" may only be sold in refillable glass bottles or dispensed from a keg. A deposit must be levied on such containers. This law has led to Malta having one of the most successful deposit-and-return schemes in Europe with a return rate of more than 90%.

Institutional Framework

The Ministry of the Environment includes the

- Environmental Protection Department (EPD), responsible, inter alia, for the development and implementation of waste management policy;
- Works Division, responsible, inter alia, for the preparation of the solid waste management plan for Malta and through its Waste Management Strategy Implementation Department (WMSID), responsible for the provision and operation of public sector waste management facilities.

At present, the ministry lacks sufficient staff and in many cases the expertise.

The Ministry of Health is responsible for the management of health-care waste, and for inspection and enforcement of public health regulations. The Ministry of Agriculture and Fisheries is responsible for the management of animal and agricultural waste.

The Malta Maritime Authority is responsible for waste management activities within the port areas, and for controlling discharges into the marine environment. It should also ensure the provision of adequate waste reception facilities within the main ports.

Malta's 68 local councils have to provide municipal waste collection services within their respective localities and to inform their residents about waste management issues. They have the right to issue bye-laws on waste management.

The Malta Institute of Waste Management is a professional association trying to raise awareness and promote higher standards of waste management.

In order to achieve an optimum waste management, the government plans to found various new institutions and organisations. During the first quarter of 2002, an Inter-Ministerial Steering Group was set up whose ambition is to supervise, coordinate and monitor the implementation of the solid waste management strategy.

By the end of 2002, an Environmental Protection Authority (EPA) will be established as a semi-autonomous regulatory agency. Its primary tasks will be the issue of licences and permits for waste management facilities and activities and the monitoring and inspection of waste management activities. The authority will also provide advice on appropriate methods of managing particular waste streams, and develop technical standards relating to waste management.

A Waste Management Inspectorate will be a part of the new Environmental Protection Authority. It will have full responsibilities and powers for the enforcement of legislation, regulations and standards relating to waste management.

Malta intends to create a semi-autonomous Waste Management Service Agency (WMSA) to be responsible for organising, supervising and controlling the major waste management facilities and related services. It is expected that the management and technical staff of the existing Waste Management Strategy Implementation Department will form the nucleus of the new WMSA.

A "Recycled Building Materials Working Party" was founded in the first quarter of 2002 as a forum for regular communication, decision-making and agreement among the main interest groups within the quarrying and construction industry. It will include representatives from the Building Industry Consultative Council (BICC), from the main waste producers and from relevant government bodies (like the Ministry of the Environment, the Planning Authority, the Environment Protection Authority).

A National System for Hazardous Waste Management will be installed at the end of 2004. This is going to be a governmental institution whose task will be to ensure the collection, interim storage, pre-treatment, export and disposal of hazardous waste in accordance with legal requirements and best practices.

Legal waste information requests

Legal waste information requests have been introduced just recently. The new waste management (waste oils) regulations foresee that generators of 500 litres or more of waste oils per year must keep record of the quantity, quality, origin and loca-

tion of such oils. According to the new regulations for polychlorinated biphenyls and terphenyls, disposal facilities of PCBs must keep registers of the quantity, origin, nature and PCB content of PCB waste delivered to them.

The waste management (permit and control) regulations of 2001 require all operators of waste disposal and recovery facilities to keep specified records. The competent authority shall maintain a national waste register based on the hazardous waste consignment notes. The register is made available for the general public.

Waste information collection

In Malta, there are no regular surveys upon waste. Current statistics are based upon the data provided by the landfill weighbridges at Maghtab and Qortin. The landfill employees require information from the waste transporters, but are frequently not answered because a legal basis is missing. So it is very difficult to classify the waste by sources. Another obstacle is the lack of a standard waste catalogue.

The Waste Management Department is at present upgrading and harmonising its waste classification system in accordance with NACE. Several Phare projects have been proposed in order to establish hazardous and municipal waste information systems according to EU standards.

As to household waste, samples have regularly been taken from waste transport vehicles since 1996. From April 2002 until March 2003 the National Statistics Office has been carrying out a household waste composition survey. One week in every quarter 400 randomly selected households are asked to place their daily waste in specially-supplied garbage bags which will be analysed and weighed. For analysis, the waste will be separated into the waste fractions: plastic containers, plastic films, paper, cardboard/cartons, food remains, glass bottles, ferrous cans, aluminium cans, textiles, hazardous waste and other.

Selection of documents

'A solid waste management strategy for the Maltese Islands', Ministry of the Environment, Floriana, 2001.

'Household waste composition survey', News Release No 41/ 2002 of the National Statistics Office, Valletta.

'Sant Antnin waste treatment plant - Statistical data for 2001', homepage of the Ministry for Resources and Infrastructure (www.mri.gov.mt/wmsid/sa2001.htm).

Institutions and contacts

Institution	Contact
National Statistics Office	www.nso.magnet.mt
Ministry of the Environment Environment Protection Directorate	www.environment.gov.mt

Information collected using Eurostat/OECD joint questionnaire

General remarks

The Eurostat/OECD joint questionnaire (JQ) on waste[1] collects information in a two-yearly periodicity from OECD countries including European countries. Eurostat uses only the information from the EU Member States and the accession countries.

The data collection on municipal waste comprises four topics, which are requested in three different tables of the JQ:

- generation and collection of municipal waste (JQ Table 5a);
- composition of mixed municipal waste (JQ Table 5b);
- separate collection of waste fractions (JQ Table 5b);
- treatment and disposal of municipal waste (JQ Table 5c).

These topics are related to the following important questions on waste.

- What is the amount of waste generated?
- What is the structure of mixed municipal waste?
- Is it worthwhile to start separate collection activities?
- What is the amount of separation reached?
- How is waste treated and disposed?

The data requirements of the JQ might not fit all countries it is send to as they have different levels of industrial development, social welfare, prosperity, consumption habits and technical development of waste management. This leads to a considerable amount of empty cells and to misunderstandings despite exhaustive explanations and definitions.

Municipal waste generation and collection

Municipal waste as defined in the JQ [2] is a complex and vague term. In general, it includes household waste and waste originating from other sources. In addition to this vague general definition several specifications are added concerning waste fractions either included or excluded [3]. Some definitions and specifications are more declarations of interesting topics than statistical concepts which can be exactly fulfilled. The degree of precision and accuracy is not yet sufficient. This makes any comparison between countries weak. Comparisons can only indicate differences.

Problems of determining the amount of municipal waste.

The JQ distinguishes between several concepts related to municipal waste which are difficult to fulfil in all countries. The following concepts are used:

- municipal waste generated;
- municipal waste collected;
- municipal waste managed;
- municipal waste collected by and on behalf of municipalities;
- municipal waste collected by private enterprises.

There are two reasons to underestimate the amount of municipal waste to be managed if only the amount of collected municipal waste can be registered.

- The first reason is that the whole territory is not covered by regular waste collection activities in some countries. For these countries the estimation should be made on the waste quantity generated in areas not covered [4]. Such an estimate might be difficult because of the specific production and consumption conditions, which might be different in non-covered areas in each region supplied with Public Services. In addition, the estimation becomes even more difficult because the definition of waste in such areas might be different (subjective dimension of the waste definition according to the waste framework directive).
- The second reason is derived from the privatisation of waste management under or outside the control of municipal authorities. This development can also lead to an underestimation of waste collected and as a consequence of waste generated if the amounts of waste collected by private enterprises are not included. This problem is related to the very important and fundamental question on how to differentiate between waste and non-waste. In particular the private collection activities outside the supervision of municipal authorities are connected to secondary raw materials (textiles, glass, scrap, etc.), which have a positive impact on the economy.

How did the accession countries take the difficulties into consideration?

1. Private collection outside municipal control

   For the reference year 1999, no country provides any information on the amount collected by private enterprises outside municipal control. For the latest reference year, which is for most of the accession countries the year 2000, only three countries – Lithuania, Latvia and Poland – can already supply data for 2001 [5] and only Estonia gives a small

(1) Waste is only one part of the JQ. It also covers the domains of water, noise and wildlife.
(2) Municipal waste includes according to the OECD/Eurostat questionnaire definition household waste and similar waste types from households, commerce and trade, small businesses, office buildings and institutions (schools, hospitals, government buildings) collected by or on behalf of municipalities and/or collected directly by the private sector (business or private non-profit institutions) not on behalf of municipalities (mainly separate collection for recovery purposes)
(3) A handbook on municipal waste statistics has been developed in the framework of the Phare multi-country project on waste statistics. This handbook aims to specify on operational level the problems with regard to harmonised municipal waste statistics, and to propose solutions. It is available at Eurostat.
(4) This data is requested in the last row of table 5a of the JQ.
(5) Reference month is June 2002; at this date the countries should have supplied Eurostat with their latest data. It should be mentioned that the JQ is sent out every second year, but there are 'columns' foreseen for each past year. It's a two year survey but collecting all information which was collected between the survey periods.

amount of 62 000 tonnes collected by private enterprises. It is worthwhile to note that only one EU Member State is capable of providing any information on this topic [1].

2. Waste generated in areas not covered by municipal waste collection

   Only three countries (Hungary, Romania and Slovenia) provide data for waste generation in their latest reports that are not identical to the data for waste collection. These countries use different methods:

- Hungary extrapolates from the people covered to the whole population assuming that the same amount of waste is produced in average in non-covered areas.
- Slovenia determines the amounts generated in non-covered areas on the basis of landfill reporting. The amount of municipal waste, which is brought directly to landfills either by enterprises or by individuals are aggregated. This sum is defined as the amount of waste of non-covered areas. The assumption is that all generated waste in these areas are brought to the surveyed landfills.
- Romania has a relatively high percentage of people covered by municipal waste collection (90 % in 2000), but this figure is only derived from urban areas. In rural areas there is no collection at all. The estimation procedure includes two steps: the determination of the amount of waste in urban areas and in rural areas.

The JQ requests from the countries to split the amount of collected waste [2] into three different categories:

1. municipal waste collected by origin;
2. municipal waste by type of waste;
3. municipal waste by type of collection.

Municipal waste collected by origin

The origins for the municipal waste collected are in any case difficult to determine because the public or private enterprises must have well developed bookkeeping systems. The condition to get sufficient information is that municipalities or private enterprises, which are engaged in these collection activities, can distinguish between household and commercial waste either on the basis of contracts they have with house or settlement owners or on the basis of different units in their enterprises operating for different clients.

- 9 of the 12 countries (75 %) are capable to specify at least one origin or source for the amount of municipal waste collected (for EU Member States the fraction is 8 of 15 or 53 %).
- 7 countries can specify at least two sources.
- 3 countries are capable of making a complete breakdown of the waste collected into the three different sources.

Principles for the establishment of the table below:

Only figures explicitly given by accession countries are utilised for the calculation of the percentages. The percentages are always calculated by dividing through the total amounts collected, which are given in the last row of the table. For the dark and light shaded cells accession countries have given no information. This has different meanings:

1. Countries who have indicated only one source (CZ and PL) are not capable of differentiating the remaining amounts by origins.
1. Countries (HU and CY) have already split up the total amount into two different origins – missing amounts for municipal services. No separation possible.
2. One country (SK) has identified two of the three sources but not given the quantity for the last source. The amount for the remaining origin cannot be identified despite the fact that data for the other two are given. This means that the data provided are not comprehensive so that the remaining amount can also belong partially to one or two of the already specified sources.
3. The remaining three countries (LV, LT and BG) are not capable of specifying the amount of waste generated.

(1) Working document 'Dissemination of the results from the Eurostat/OECD joint questionnaire 2000 data collection on waste' for the meeting of the Working Group 'Statistics of the Environment' Sub-Group 'Waste' Joint Eurostat/EFTA group, 5 and 6 November 2001. Only Sweden reports about 25 % of waste collected outside the municipal waste regime by private enterprises.

(2) In the following we will only refer to the collected waste because any specification or break down can only be done for these amounts.

Table 3.1

Municipal waste collected by origin [a]

	BG	CZ	HU	EE	LV	LT	PL	RO	SK	SI [b]	CY [c]	MT
(in %)												
Households			65.5	31.6			69.3	51.7	52.1	67.8	83.2	53.2
Commerce, trade, small businesses, office buildings institutions			34.5	65.9				29.5		28.9	16.8	10.1
Municipal services		1.0		2.5				18.7	6.2	3.3		36.7
(in 1000 tonnes)												
Total quantities of wastes collected		3 434	4 084	633			12 226	6 611	1 706	1 080	369	188

(a) All percentages and the total amounts in the last row refer to the year 2000 except for Slovenia (1998).
(b) 1998.
(c) 1995.

Source: *Eurostat/OECD joint questionnaire, 2000.*

Municipal waste by type of waste

In the joint questionnaire there are only three types of waste distinguished:

- Household waste (as a specific waste type);
- Bulky waste [1];
- Others.

It is not easy for the accession countries nor of course for EU Member States and other OECD countries to split up their waste amounts collected accordingly. The reasons are as follows.

- Bulky waste belongs of course to household waste type if it is collected despite its 'bulkiness' together with 'normal' household waste. Only if the 'bulkiness'-character leads to separate collection activities, can it and should it be then specified. This might lead to a certain confusion because bulkiness is a relative concept related to the volume of garbage tonnes and containers available.
- Also the differentiation between household waste including similar waste as defined in the JQ [2] and 'other wastes' is not obvious or easy to identify. The definition of municipal wastes refers to household wastes and following this definition any 'other wastes' belonging to municipal wastes should not exist. Accession countries and also EU Member States [3] have given under 'other waste types' information on special waste fraction which are separately collected or which can be identified in another way.

Principles for the establishment of the table below:

Only figures explicitly given by accession countries are utilised for the calculation of the percentages. The percentages are always calculated by dividing through the total amounts collected, which are given in the last row of the table. For the dark and light shaded cells the accession countries have given no information. This has the following meaning:

The dark shaded cells cannot be filled out, because the total amounts are already distributed. This is the case for BG, HU, EE, LT and RO. It means that before all bulky waste cannot be identified because it is either not included in the information collection or not separately collected.

- Two countries (CZ and SK) have specified the amounts for two types but left the remaining cell open (light shaded). They are following the principle only to give information on what is positively known.

(1) Bulky waste is defined in the JQ as 'waste that due to its bulky character needs special considerations for its management. Examples are white goods, old furniture, mattresses, etc. Excludes construction and demolition waste'.
(2) Household and similar waste is defined in the JQ as 'waste from households as well as other waste, which, because of its nature or composition, is similar to waste from households'.
(3) For example Germany gives for 1996 under 'other waste types' the amounts of waste collected separately under the 'Duales System' – about 16 million tonnes or 36.5 % of total municipal waste.

Table 3.2

Municipal waste by type of waste [a]

	BG	CZ	HU	EE	LV	LT	PL	RO	SK	SI [b]	CY	MT
(in %)												
Household and similar waste	60.6	[c] 57.9	100.0	90.2		100.0		81.3	64.1	81.8		55.9
Bulky waste									[d] 8.3	7.3		12.2
Other	[e] 39.4	[f] 5.7		[g] 9.8				18.7		[h] 10.9		31.9
(in 1000 tonnes)												
Total quantities of wastes collected (identical with table above)	3 318	3 434	4 084	633		1 086		6 611	1 706	1 080		

(a) All percentages and the total amounts in the last row refer to the year 2000 except for Slovenia (1998).
(b) 1998.
(c) All percentages and the total amounts in the last row refer to the year 2000 except for Slovenia: Reference year is 1998 for Slovenia.
(d) Includes not only bulky waste but also Construction & Demolition waste.
(e) 'Other wastes' includes for Bulgaria 'Hospital waste', 'Construction & Demolition waste', 'Agriculture waste' and others which can not yet be identified.
(f) The amount of 197.000 tons refers to garden and park wastes according to explanation given in the JQ.
(g) The 'other wastes' contain for Estonia separately collected fractions (EWC 20 01); garden and park waste (20 02) and other municipal waste (20 03, excluding 20 03 01).
(h) The category other wastes' includes fro Slovenia separately collected waste fractions, street cleaning resides, waste from markets, park and garden waste and cemetery waste and other similar waste.

Source: *Eurostat/OECD joint questionnaire, 2000.*

The table above shows that the differentiation by waste types is enormously difficult. Only two countries – Slovakia and Slovenia – provide figures on bulky waste collection. The percentages given for these countries – 7.3 and 8.3% of total municipal waste collected – seem to be reasonable if one compares them with EU Member States. Nearly all EU Member States which are capable to give information on bulky waste collected provide comparable percentages between 4% and 8.1% (Austria, Germany, Luxembourg and Spain) [1].

Municipal waste by type of collection

The third specification which is requested in the joint questionnaire is the differentiation by waste collection types. Two Cases can be differentiated:

1. Countries who can perfectly specify their waste collection system on which they are reporting (BG, HU, EE, LT, MT, RO and SL);
2. Countries who can only specify some collection types but split up the total amount (CZ and SK).

Three countries (CY, LV and PL) give no information on this topic.

(1) In total five EU countries are up to now capable to deliver data on bulky waste. Denmark is showing constantly percentages about 20 % for bulky waste as part of municipal waste collected.

Table 3.3

Municipal waste by type of collection[a]

	BG	CZ	HU	EE	LV	LT	PL	RO	SK	SI [b]	CY	MT
in Percent												
Traditional collection	100	---	100	90.2		100		100	52.1	85.2		100
Collection of bulky waste	---		---	---		--		---	8.3	7.3		---
Separate collection of waste fractions		5.0		9.8					6.0	7.5		
in Thousand Tons												
Total quantities of wastes collected (identical to table above)	3.318	3.434	4.084	633		1.086		6.611	1.706	1.080		188

(a) All percentages and the total amounts in the last row refer to the year 2000 except for Slovenia (1998).
(b) 1998.

Source: *Eurostat/OECD joint questionnaire, 2000.*

Composition of municipal waste

The joint questionnaire is asking under the heading 'Composition of Municipal Waste' for the composition of two parts of municipal waste: mixed municipal waste traditionally collected and separately collected waste fractions. Both parts are split up by identical categories. Ideally this shows following the time series, how mixed municipal waste is losing components if activities on the collection of separate fractions are intensified. But the information collected on these two aspects is not yet so well developed as to make the identification of such changes possible.

Composition of mixed municipal waste

The information on the composition of mixed municipal waste is one of the most important and valuable pieces of information for waste management and planning. Activities for the collection of separate waste fractions are tackled on the basis of this information which is carefully prepared or elaborated for the regions or municipalities where the activities should start. In addition, with regard to the EU Council Directive 1999/31/EC on the landfill of waste which has also to be fulfilled in the future by the accession countries, the countries must prepare themselves for eliminating or treating biodegradable waste before landfilling.

The accurate determination of the composition of mixed municipal waste is technically and statistically a difficult and expensive task. It is mostly done in the planning phase at local or regional level for the establishment of new treatment installations like waste incinerators [1] or new collection systems.

At national level or even at EU level, information collection on the composition of mixed waste is not obligatory. Also, as already mentioned in the introduction, the OECD/Eurostat questionnaire does not force the participating countries to fill out the questionnaire completely. There is the agreement that the countries will do the utmost to supply Eurostat and OECD with tables in time and as complete as possible. But nevertheless there is a consensus in waste management and waste politics that the information on the composition is important and the generation should be improved [2].

Some 9 of the 12 accession countries provide data on the composition of waste. Cyprus, Estonia and Poland are not able to deliver any data. Some countries do possess time series and some others only snapshots derived from a certain peculiar approach. Mostly the data are only extrapolations for the national level from certain surveys or estimations made for one or several cities or attached landfills.

(1) Detailed nationwide composition analysis (between 1977 – 85) was once carried out in Germany under the title: 'Nationwide Domestic Waste Analysis – Survey on domestic waste arising and composition in the old states of the Federal Republic of Germany'. This survey also included the chemical analysis and was never repeated again.
(2) The European Commission is currently financing a project which intends to harmonise the methods for surveying the composition of waste (SWAT project). In addition, within the framework of the Phare multi-country project Romania and Malta got support to carry out pilot projects for applying and testing the principles developed in the SWAT project in the accession countries. These pilot projects were due to be finalised in mid-September 2002 and the final reports will be on the Eurostat web site.

Table 3.4

Composition of mixed municipal waste [a]

	BG	CZ [b]	HU	EE	LV [c]	LT	PL	RO	SK	SI [d]	CY	MT [e]
(in 1000 tonnes)												
Total amount collected	3 318	3 200	4 084			1 086		6 611	1 706	1 024		
Paper, cardboard, paper products	288	250	560			217		1 058	222	152		
Textiles	108	67	143			-		397	-	-		
Plastics	292	122	453			81		727	119	99		
Glass	174	138	102			81		397	137	54		
Metals	75	74	74			22		331	51	67		
Organic material			1 662					3 239				
of which: Food and garden waste	1 323	586	1 662			543		2 591	648	331		
Bulky waste [f]												
Other waste	1 058	1 965	1 090			141		462	529	321		
(in %)												
Paper, cardboard, paper products	9	8	14		14	20		16	13	15		14
Textiles	3	2	4		3	-		6	-	-		5
Plastics	9	4	11		7	8		11	7	10		10
Glass	5	4	3		8	8		6	8	5		4
Metals	2	2	2		4	2		5	3	7		4
Organic material			41					49				
of which: Food and garden waste	40	18	41		48	50		39	38	32		60
Bulky waste												
Other waste	32	61	27		16	13		7	31	31		3

(a) The upper part of the table contains the splitting up of the total amounts; the lower part presents the corresponding percentages allowing direct comparison of the mixed waste structure in accession countries. For two countries (LV and MT) figures for the upper part are not given, because they feel not competent to estimate or extrapolate for the national level. The percentages given are first attempts or indicators for the national level.
(b) 1996.
(c) 1995.
(d) 1995.
(e) 2002.
(f) No country is specifying (or is able to specify) the amount of bulky waste because of evident reasons: Either the determination method is excluding bulky waste or bulky waste is not arriving at the places where the determination takes place.

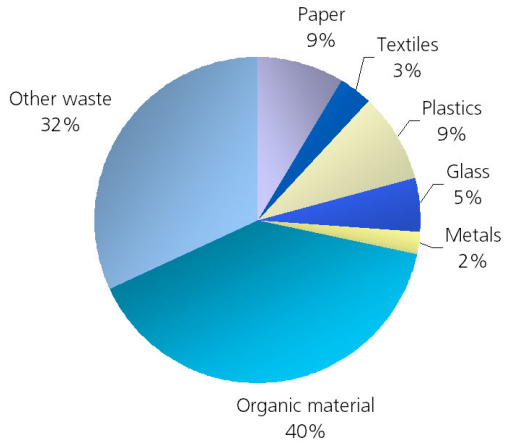
Source: *Eurostat/OECD joint questionnaire, 2000.*

Bulgaria

The data on the composition of municipal waste are estimations provided by the 'Executive Environmental Agency'. The basis for the estimations are certain non-harmonised surveys on landfills belonging to big cities. There is no further information available on how the surveys are carried out. It must be assumed that the surveys are not systematically done and, in addition, not harmonised. As the amounts are determined at landfills, waste streams which are separately collected and recovered are excluded by definition from the amounts.

Figure 3.1

Composition of mixed municipal waste, Bulgaria



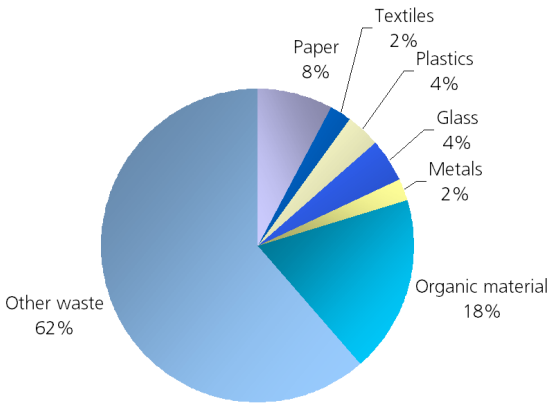
Source: Eurostat/OECD joint questionnaire.

Czech Republic

The Czech Republic only once delivered (1996) data on the composition of mixed municipal waste. But even in 1996 the non-specified amount ('others') was rather high – more than 60 %. The strategy seems to be to detect and specify only those few fractions which are important from the economic point of view (plastics, specified in 1998) or with regard to landfill strategy (garden waste, specified in 2000).

Figure 3.2

Composition of mixed municipal waste, Czech Republic



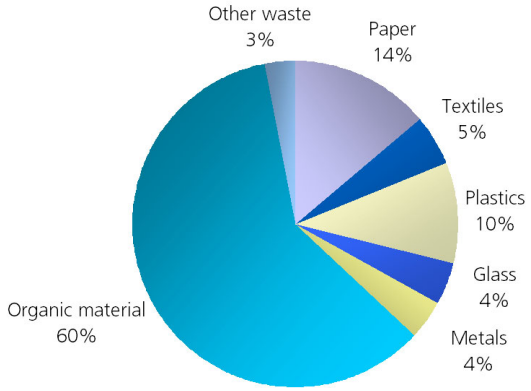
Source: Eurostat/OECD joint questionnaire.

Malta

In 2001, Malta started to carry out a survey on the composition of municipal waste. Selected households had to fill their daily waste in plastics sacks (one plastic sack for each day) which where than collected and sorted at the 'Sant Antnin plant' on Malta [1]. The figures given are the results of the first part of the survey which does not take account of the seasonal variation.

Figure 3.3

Composition of mixed municipal waste, Malta



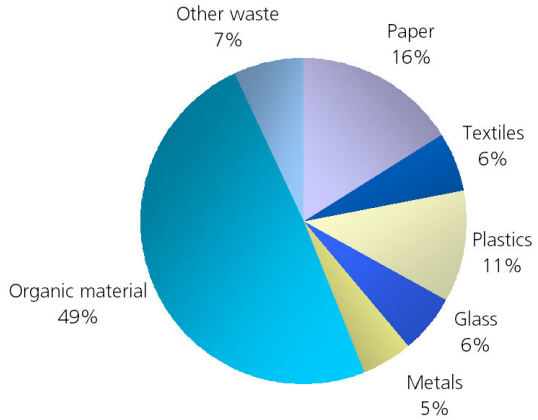
Source: Eurostat/OECD joint questionnaire.

Romania

Romania provided annual data from 1995 to 2000. Two information sources are used: All municipal waste collectors are asked to fill in an annual questionnaire and ICIM is doing, in addition, experiments with an as yet non-standardised methodology. Both methods led, e.g. for 2000, to very similar results only with some differences with regard to textiles and others [2].

Figure 3.4

Composition of mixed municipal waste, Romania



Source: Eurostat/OECD joint questionnaire.

(1) For the first part of the survey the selected households had to fill the plastic bags daily (in Malta like in other southern countries there is daily waste collection) for one week. The sorting at Sant Antnin was done according to a classification of 11 types: 'Plastic Containers', 'Plastic Films', 'Paper', 'Cardboard/Cartons', 'Food Remains', 'Glass Bottles', 'Ferrous Cans', 'Alum. Cans', 'Textiles', 'Hazardous' and 'Others'. These 11 categories were aggregated to the categories in the Joint questionnaire. The final report will be put on the Eurostat web site.

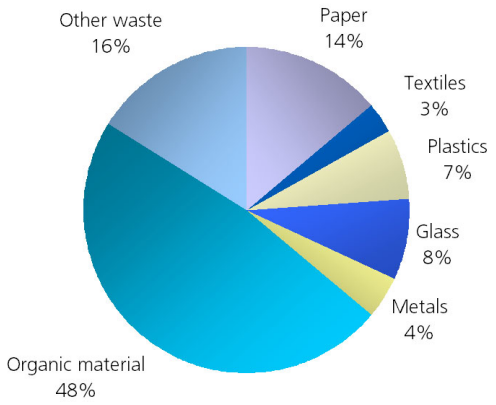
(2) As already mentioned ICIM – Romania is carrying out a pilot project on the standardisation of determination of municipal waste composition which was due to be finalised in mid-September 2002 and put on the Eurostat web site.

Latvia

There is up to now no regular and systematic determination of composition of municipal waste in Latvia. In some pilot projects in certain cities the composition of municipal waste was determined by weighting sorted fractions from mixed municipal wastes. With the new Latvian laws on packaging entering into force in the beginning of 2002 methods will be developed in the future to collect information systematically. The data provided represents the composition of the capital Riga.

Figure 3.5

Composition of mixed municipal waste, Latvia



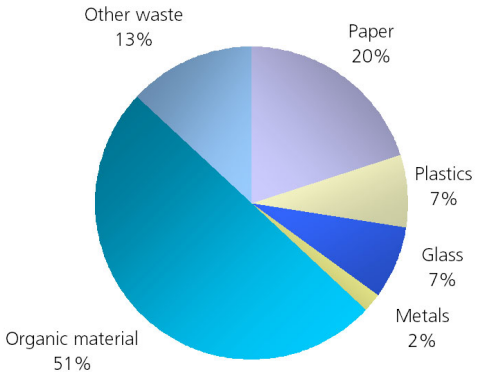
Source: Eurostat/OECD joint questionnaire.

Lithuania

Lithuania is up to now not carrying out systematic surveys on the composition of municipal wastes. It intends to start composition analysis for the whole country at the end of 2002 within the framework of the obligations with regard to the targets of the landfill directive which has already been implemented in Lithuania. The figures given in the questionnaire show a clear break between 1997 and 2000. This break is related to two reasons. The first composition data (1995–97) were generated at the city of Kaunas and the figures for 2000 at Vilnius and secondly development leads to a much higher amount than before for 'paper, cardboard and carton'.

Figure 3.6

Composition of mixed municipal waste, Lithuania



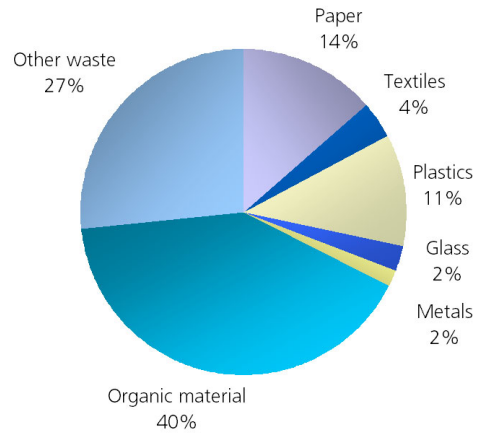
Source: Eurostat/OECD joint questionnaire.

Hungary

Hungary has provided national annual data on waste composition since 1995. The source for the information is the 'Public Areas Maintaining Stock Company of Budapest'. The data given in the joint questionnaire are extrapolations from Budapest to the whole country.

Figure 3.7

Composition of mixed municipal waste, Hungary



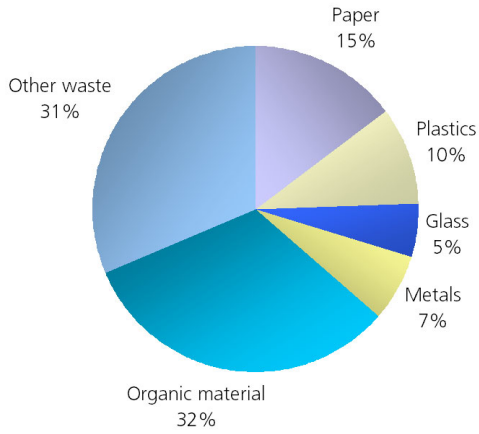
Source: Eurostat/OECD joint questionnaire.

Slovenia

Slovenia only once reported (in 1995) on the composition of mixed municipal waste. In later surveys these questions were not repeated because of unclear methodology. If a standard methodology is developed Slovenia will immediately start to apply these methods.

Figure 3.8

Composition of mixed municipal waste, Slovenia



Source: Eurostat/OECD joint questionnaire.

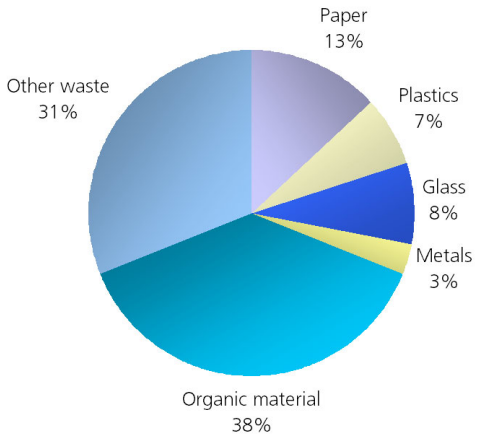
Slovakia

The determination of the composition of mixed municipal waste is not a regularly or obligatory activity in Slovakia. It is done with regard to special needs. The last determination was for the purpose of establishing 'the waste management programme until 2005'. It was a sample survey designed to generate a rep-

resentative result for the whole country. In general, the composition of waste will be determined in future on a five-yearly basis.

Figure 3.9

Composition of mixed municipal waste, Slovakia



Source: Eurostat/OECD joint questionnaire.

Composition of separate collected waste

The separate collection activity organised by municipalities does not have a long tradition in the accession countries. It started in some countries – Czech Republic, Poland and Slovakia – in the mid-1990s and in the Baltic countries – Estonia and Latvia – quite recently. In all the other countries activities have started but only cover a few regions or cities. These countries have not yet reported on these collection activities.

Table 3.5

Composition of municipal waste from separate waste collection.

	BG	CZ	HU	EE	LV (a)	LT	PL (a)	RO	SK	SI	CY (a)	MT
(in 1000 tonnes)												
Total amount collected		172		62	60		147		243		48	
Paper, cardboard, paper products		54		10	3		42		29		7	
Textiles		1							1			
Plastics		23		1	1		13		3		2	
Glass		35		10	1		86		37		1	
Metals		27		1	6		7		22		37	
Organic material		3		27								
of which: Food & garden waste				3					10			
Bulky waste					5				141			
Other waste		29		11	44				1		3	
(in %)												
Paper, cardboard, paper products		31		17	5		28		12		14	
Textiles		1										
Plastics		13		2	2		9		1		3	
Glass		20		17	2		58		15		1	
Metals		16		2	10		5		9		76	
Organic material		2		45					4			
of which: Food and garden waste												
Bulky waste					8				58			
Other waste		17		18	73						5	

(a) 2001

Source: *Eurostat/OECD joint questionnaire, 2000.*

Slovakia

The Ministry of the Environment of the Slovak Republic has developed a concept of separate collection of separate raw materials. Separate collection has been implemented throughout the whole territory. At present the following wastes are collected separately: paper, glass, metals, plastics, PETs, biodegradable waste, hazardous substances, accumulators and batteries and textile (1).

Poland

In Poland the collection of separate fractions has taken place in all 'voivodships' since 1998. Up to 2001 only the bigger cities were included. Since this year the rural areas have also been covered. The waste is collected in centrally placed containers or taken from producers. The following fractions are collected: 'paper, cardboard and paper products', 'plastics', 'glass', 'metals' and 'others'.

Czech Republic

All regional authorities have been obliged since 1998 to supply villages and cities with facilities (containers) for the reception of separate waste fractions. A complete coverage of the country has been achieved. In addition, EKO-KOM was created in 1999 for the collection of packaging waste (2).

Estonia

The introduction of a system for separate collection has started. The introduction is supported by municipal decree's e. g. for Tallinn in 2002 with the obligation to separate waste. The data set provided for the year 2000 does not yet cover the whole country.

Latvia

The system for separate collection is under development and does not yet cover all regions. The following fractions are collected: 'Aluminium', 'Other non-ferrous metals', 'Lead', 'Ferrous containing metals', 'Construction/Demolition waste', 'Paper/ Cardboard waste', 'Rubber', 'Plastics', 'Textiles', 'Glass' and 'Organic waste'. The information collection via the 'State statistical survey' started with reference year 2001 and will be done annually.

Treatment and Disposal of Municipal Waste

Construction principle for the table below:

From the basic Table 5c of the joint questionnaire only the figures which deal directly with certain waste management activities like incineration or recycling are used. The various calculation terms (sums for disposal or recovery) are omitted because it is not easy and sometimes not even possible (up to now) for the accession countries to generate solid data on these topics. The most important reason for this lack of balancing is that the treatment facilities are not only treating municipal waste. Therefore it is very difficult to specify the type of treatment of municipal wastes if it is not known from the collectors' side.

(1) The collection system is based on the results of a Twinning project No.98/IB/EN 02.
(2) Please have a look at the country chapter where the activities of EKO-KOM are described in more detail.

Table 3.6

Treatment and disposal of municipal waste, in 1000 tonnes [a]

	BG	CZ [b]	HU	EE	LV [c]	LT	PL [c]	RO	SK	SI [d]	CY [d]	MT
Amounts to be managed:	3318	3017	4084	620	968	1086	11109	6611	1706	1078	369	188
Recovery operations												
Recycling		433		13			147			90		
Composting				2	16		309			21		30
Incineration with energy recovery		176	348		27							
Others	47				14							
Disposal operations												
Incineration without energy recovery		4					14					
Other final treatment:				5								
Landfill	3271		3847	601	911	1086	10638	6611	1056	960		131
of which: residues from other operations			111									
of which: controlled landfill	2281		3237	583				1000	1056	960		
Other final disposal										7		

(a) The table is based on the country replies to Table 5c of the joint questionnaire. The table gives the last available data for all countries. If the reference year is not mentioned explicitly, then the data refer to 2000.
(b) 1998.
(c) 2001.
(d) 1995.

Source: *Eurostat/OECD joint questionnaire, 2000.*

Comparison of the accession countries

Waste generation/collection per capita

Comparisons of waste data between accession countries are difficult to interpret. Background information is necessary to adjust the differences. The first table below on municipal waste per capita aims to highlight the differences in waste production by inhabitants. As municipal waste does not only include the waste generation by households or private persons but also by small enterprises included in the waste collection system, the amount of waste generated (collected) also reflects the 'strength' of the small enterprises. The other 'factor' influencing the quantity is the inclusion of fractions like construction and demolition waste, which should not be included but cannot be excluded because of practical reasons [(1)].

The graph below shows the waste generation and waste collection (if possible) per inhabitant [(2)]. Countries with a 100 % coverage of waste collection have of course identical figures (CZ, SK, CY and MT). Some countries (BG, EE, LT and PL) are only supplying data on waste collection because they are not able to precisely estimate the waste generation in non-covered areas. The remaining countries (HU, LV, RO and SL) are estimating the remaining waste generation with different methods [(3)].

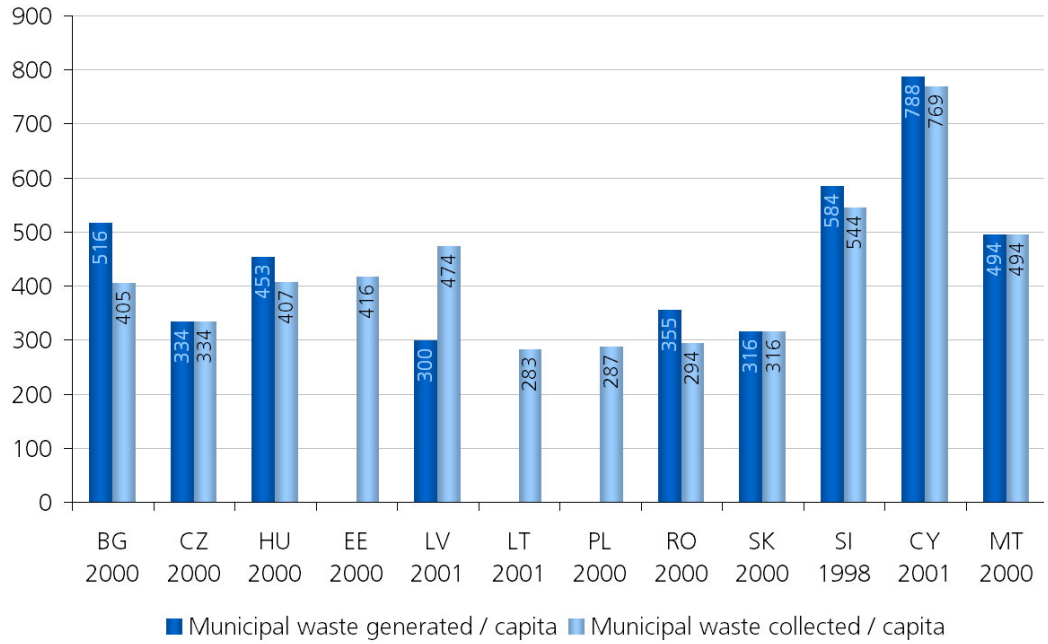
In all five countries (HU, EE, SL, CY and MT) have waste amounts generated/collected considerably higher than 400 kg per inhabitant and year. These high amounts might be connected to a certain degree with tourism. At least Slovenia, Cyprus and Malta are countries with a high tourist influence. Estonia at the other side is specifying that about 66 % of municipal waste has the source 'small enterprises, commerce, services etc.'. For Estonia it is not obvious that private consumption leads to such high amount of waste per capita.

The remaining countries are lying – save for Latvia – in the relatively small corridor between 300 and 400 kg.

(1) If the enterprise carrying out the waste collection is not differentiating between mixed municipal waste and construction waste because everything goes to the same landfill, there is no exclusion possible.
(2) Following the definition in the joint questionnaire, waste generation is equal to organised waste collection plus waste generation in non-covered areas.
(3) See the explanations above under the heading 'Municipal waste generation and collection'.

Figure 3.10

Generation and collection of municipal waste per capita, in kg.



Source: *Eurostat/OECD joint questionnaire.*

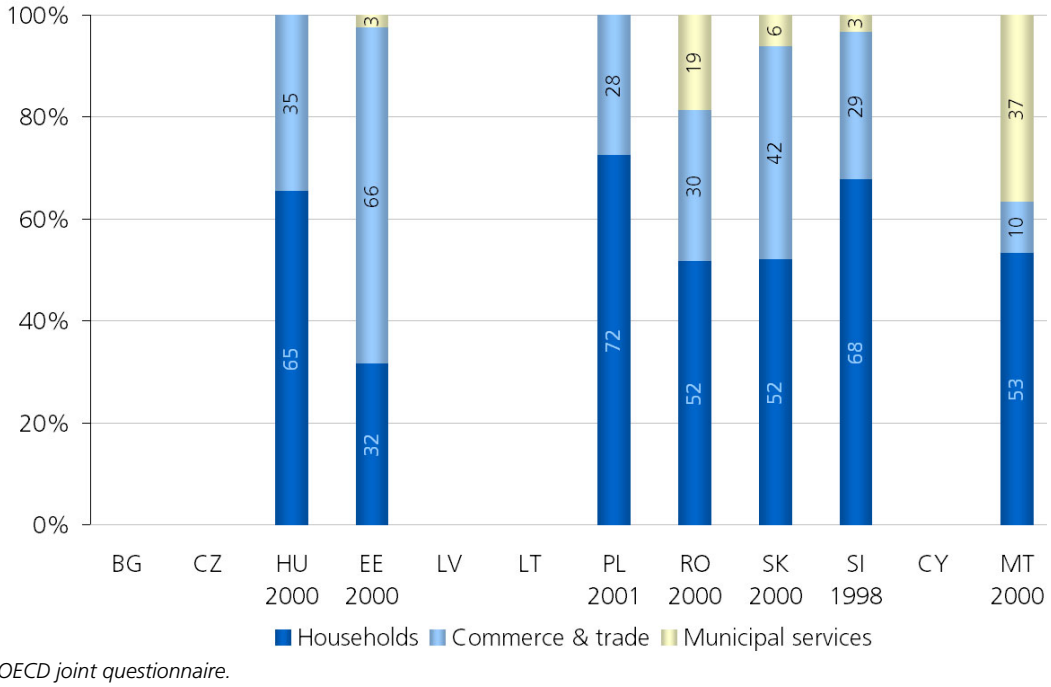
Waste collected by origin

The graph below shows before all the variation in the percentage of household waste from the total amount of waste generated/collected.

The differences between the countries are considerable. The percentages range from about 30 % for Estonia to more than 80 % for Cyprus. Some countries like Romania, Slovakia and Malta have nearly the same percentages (about 50 %) but this might be more by accident. It seems that the methodological differences and also the practical difficulties in establishing precise figures on these shares are still so enormous that no detailed comparison can be done. The differences are, to certain degree, statistical artefacts.

Figure 3.11

Municipal waste collected by origin, as % of total collection



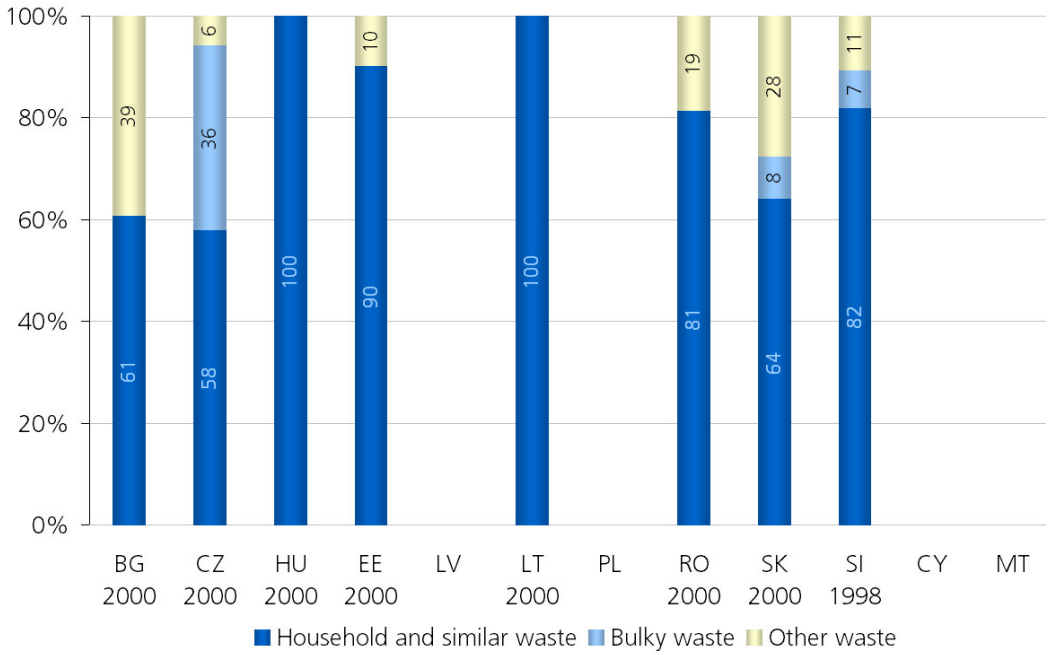
Source: *Eurostat/OECD joint questionnaire.*

Municipal waste by type of waste

The graph below refers to Table 3.2 given in the chapter above. The dominant waste type in all countries is 'household and similar wastes'. It ranges from 60 % for Bulgaria to 100 % for Hungary and Lithuania. As mentioned in the chapter above only Slovakia and Slovenia are capable of identifying 'bulky waste'. The Czech Republic specified 'household and similar wastes' as 58 % and 'garden and park wastes' as about 6 %.

Figure 3.12

Municipal waste by type of waste, as % of total



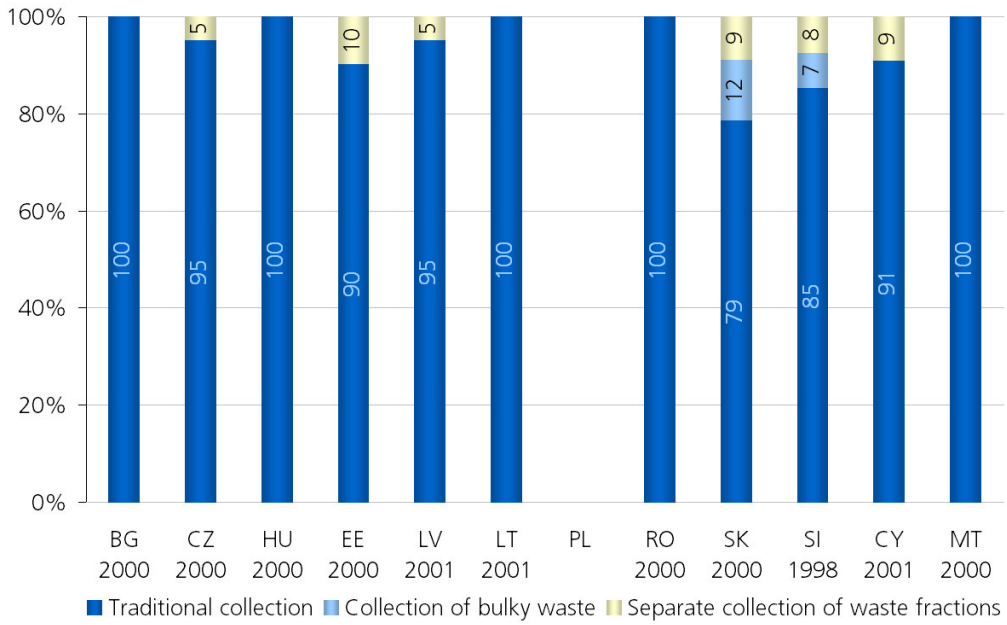
Source: *Eurostat/OECD joint questionnaire.*

Municipal waste by type of collection

The graph shows that traditional collection is by far the dominating collection method. But one has to keep in mind that the separate fractions collection activities are increasing strongly and that the situation, mirrored by the graph, might not reflect the actual situation. Several local and regional activities on separate waste collection do not seem to be included.

Figure 3.13

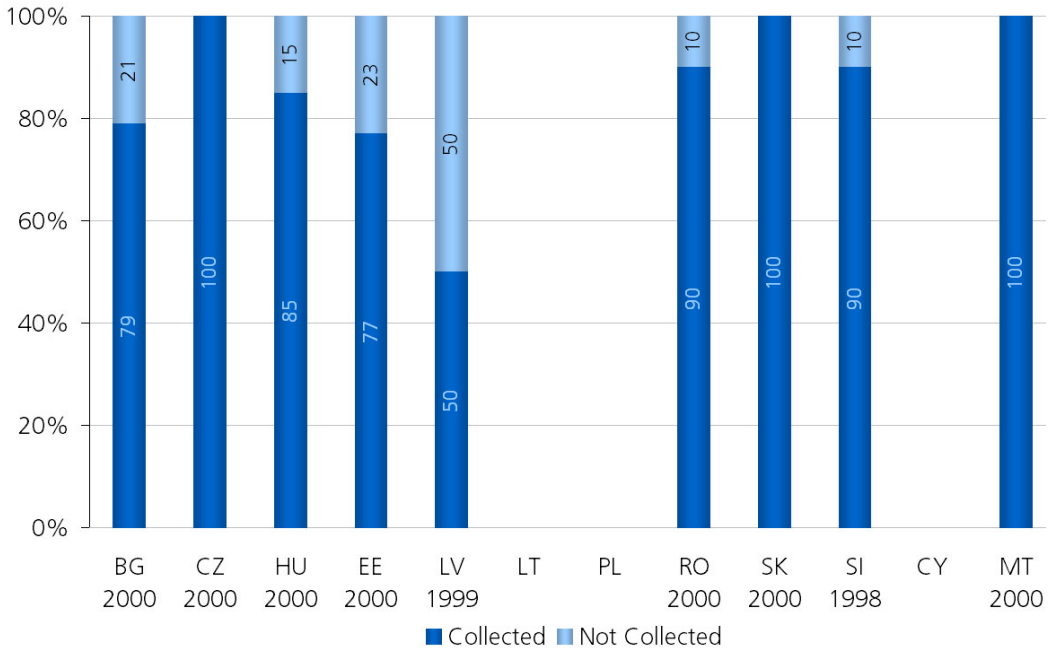
Municipal waste by type of collection, as % of total



Source: *Eurostat/OECD joint questionnaire.*

Figure 3.14

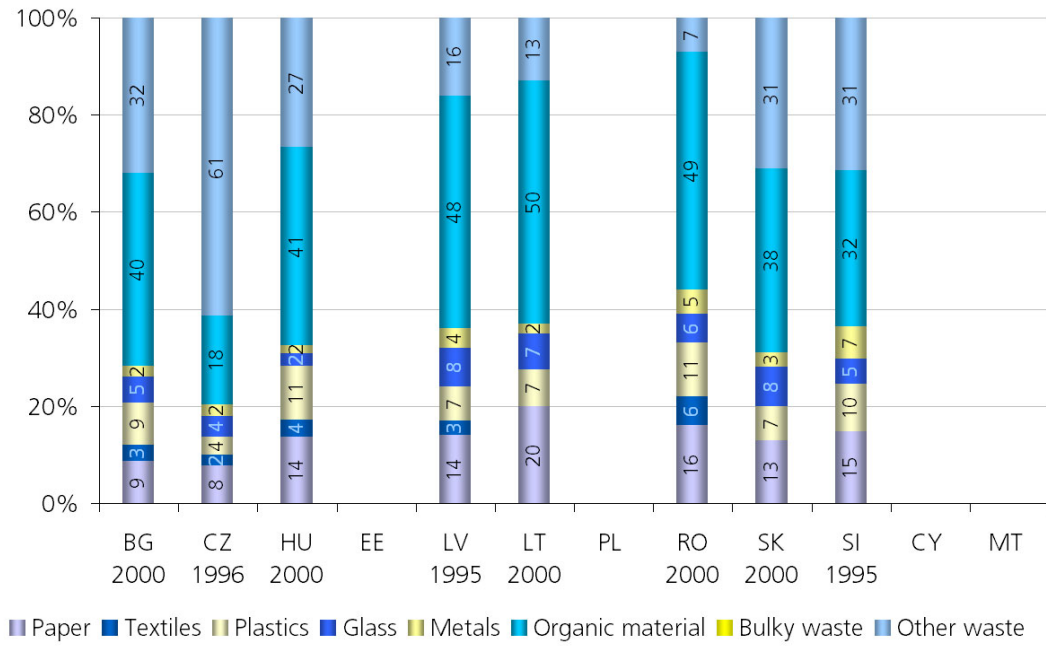
Population served by municipal waste collection services



Source: *Eurostat/OECD joint questionnaire.*

Figure 3.15

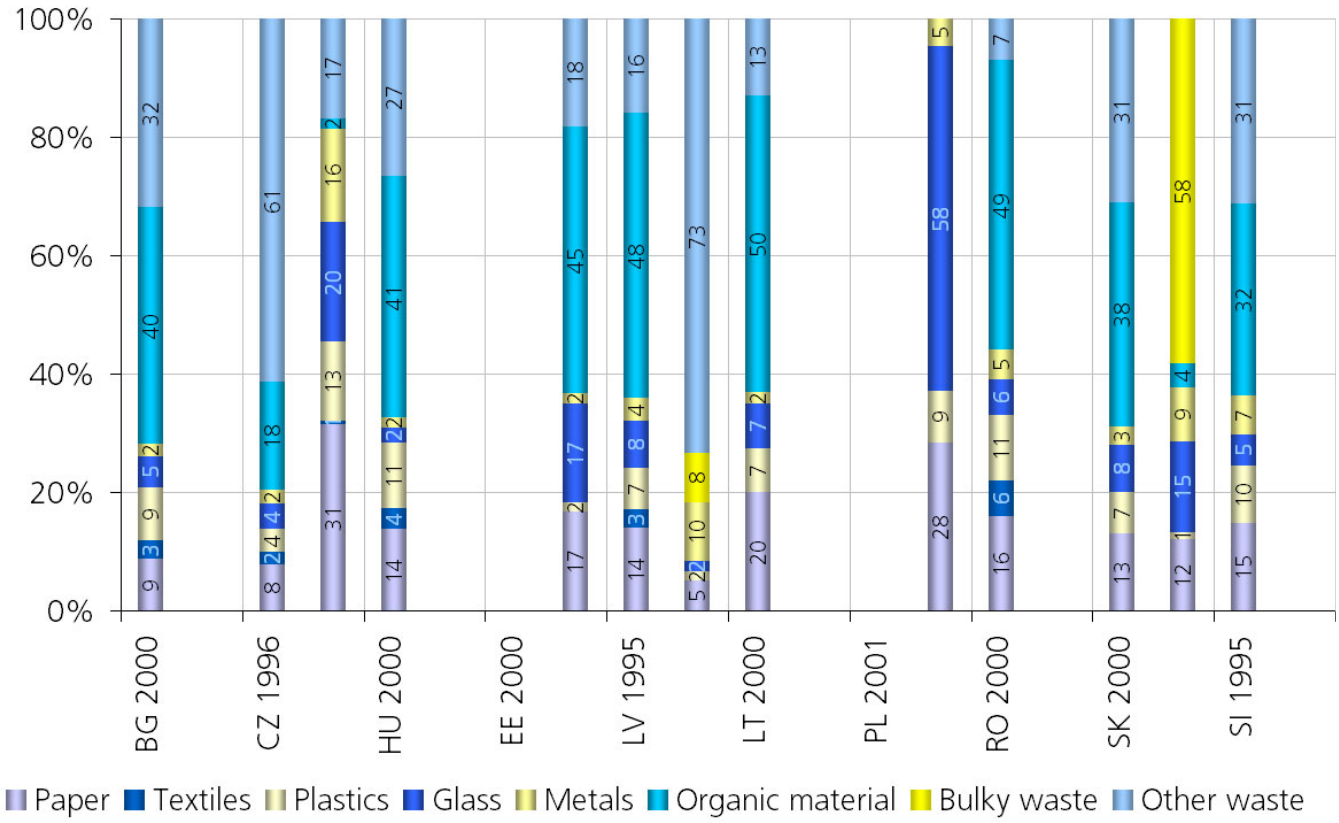
Composition of collected municipal waste, as % of total



Source: *Eurostat/OECD joint questionnaire.*

Figure 3.16

Composition of mixed and separate collected municipal waste, as % of total



Source: *Eurostat/OECD joint questionnaire.*

Time series on municipal waste collection

All accession countries do possess time series on municipal waste collection since several years. Table 3.7 and the graphical representation in the figures 3.16 and 3.17 below are showing the time series since 1995. Four countries (LV, LT, PL and CY) have already compiled data for 2001; most countries have annual data collection.

Table 3.7

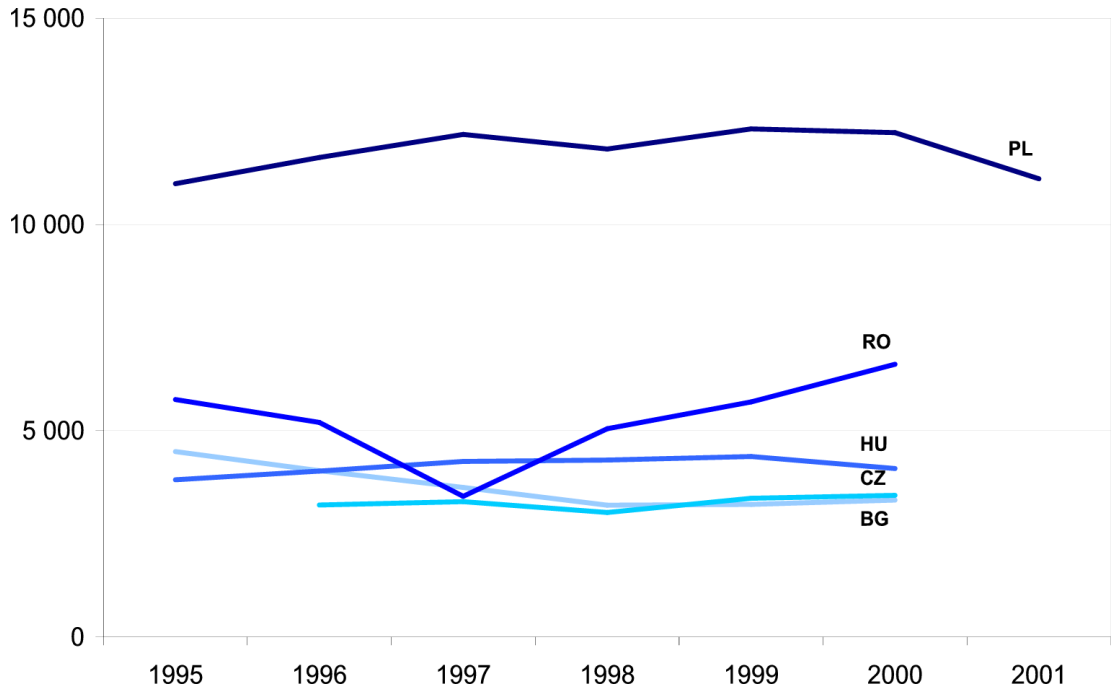
Collection of municipal waste, in 1000 tonnes.

	1995	1996	1997	1998	1999	2000	2001
Bulgaria	4 495	4 031	3 628	3 197	3 213	3 318	
Czech		3 200	3 280	3 017	3 365	3 434	
Hungary	3 811	4 023	4 258	4 292	4 376	4 084	
Estonia	533	565	593	557	569	571	
Latvia	329	325	311	299	292		1 127
Lithuania	1 546	1 445	1 510	1 578	1 236	1 086	1 046
Poland	10 985	11 621	12 183	11 827	12 317	12 226	11 109
Romania	5 758	5 202	3 410	5 050	5 699	6 611	
Slovakia	1 620	1 700		1 700		1 706	
Slovenia	862			1 080			
Cyprus	402	438	455	476	494	513	525
Malta				145	179	188	

Source: *Eurostat/OECD joint questionnaire.*

Figure 3.17

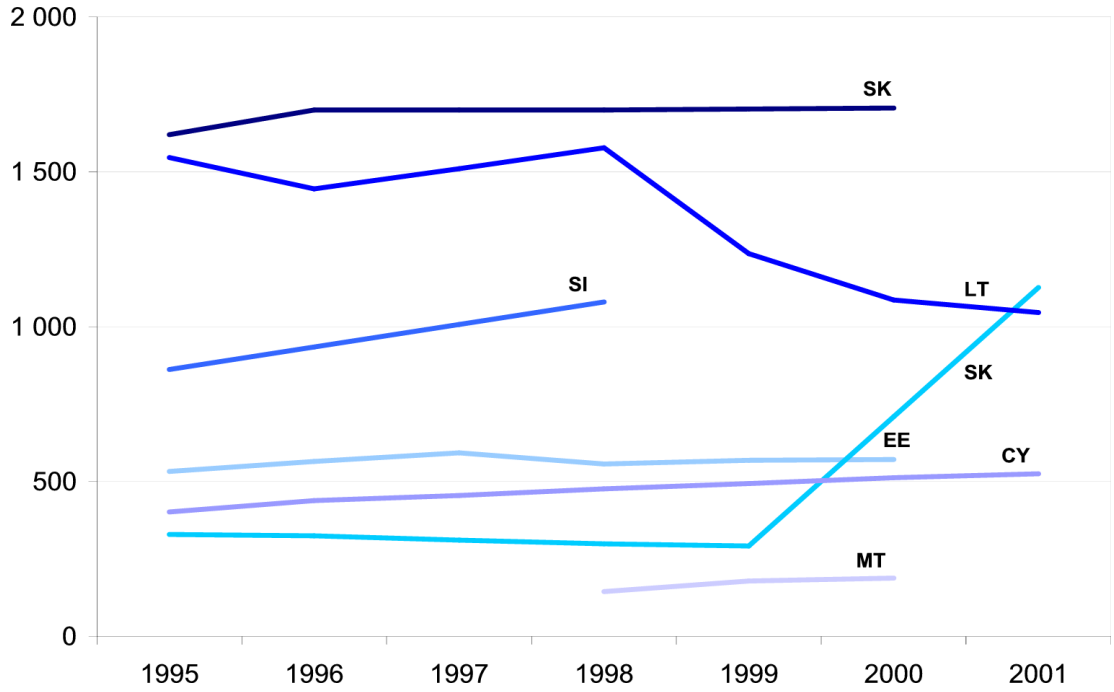
Collection of municipal waste, in 1000 tonnes.



Source: *Eurostat/OECD joint questionnaire.*

Figure 3.18

Collection of municipal waste, in 1000 tonnes.



Source: *Eurostat/OECD joint questionnaire.*

Summary

The data collected with the joint Eurostat/OECD questionnaire on municipal waste from the accession countries are quite 'fresh' (data for 2001 are already available for some countries) and there are in addition not very many gaps due to insufficient data collection. But the data quality seems to be quite weak for some parts.

Data gaps

'Feigned' data gaps

It must be mentioned at first that non-available information does not necessarily signify the existence of a data gap. If a question refers to a certain kind of waste management and this management does not exist, then, of course, this question cannot be answered positively. Lack of data due to such a reason is called a 'feigned' data gap.

These feigned data gaps resulting from non-existing waste management activities like 'collection of separate waste fractions' and 'other waste treatment facilities' (i.e. other than landfilling) explain major data gaps in the accession countries.

Lack of sufficient waste bookkeeping

In addition to the feigned data gaps mentioned above, 'semi-feigned' data gaps also exist. These are due to the non-capability or unwillingness of enterprises (municipal waste collectors) to specify waste sources and waste types for the wastes they are collecting. These data gaps cannot be closed by statistical offices and environment agencies alone, nor can these problems be solved in the short or medium term. First of all, there should be an obligation for the enterprises to report on their waste management and these reports have to be controlled. Secondly, the reporting should be done in a harmonised way by the application of reporting formats which are mostly not yet developed. Data gaps resulting from non- or less developed enterprise waste bookkeeping can only be closed by the development and implementation of reporting formats from the side of the administration and by training of responsible persons in the enterprises.

Data gaps resulting from non-existing surveys or missing data compilation

Data gaps resulting from non-existing surveys (or other data compilation) either from statistical offices or environment agencies have almost closed with regard to municipal waste collection. By 2000, all countries, except Cyprus and Latvia, were carrying out already regular surveys on municipal waste. In 2001, Cyprus and Latvia also started with annual surveys and the compilation of waste reports.

Data gaps with regard to the following all result from non-existing waste management:

- the composition of mixed municipal waste;
- the collection of separate waste fractions;
- other waste treatment installations.

Various studies on mixed municipal waste composition were carried out but as the methodology harmonisation in the EU on this topic is not yet complete it is very difficult for the accession countries to develop in this field.

The most important problem which can be tackled directly is the data quality.

Data quality

Data quality depends on the availability of technical and administrative tools.

First of all, weighing bridges for the precise determination of the quantities of wastes must be available. This is, by far, not the case for most of the landfills operating in the accession countries (1). In addition, the precise determination of waste types and waste sources at the side of waste collectors is just starting and cannot be seen as perfect (2).

Waste surveys carried out by statistical offices can only collect such information from waste collectors currently available. Possibilities of getting additional information are very restricted and may lead initially to weak estimates (3).

Despite the fact that it seems theoretically quite easy to identify all municipal waste collectors (4) and to establish and update a comprehensive register of these enterprises, there exist, even on this topic, difficulties in some countries (5). These are due to the highly dynamic development of waste management and the relatively slow development of waste control. This leads to an imperfect database on waste collection and an underestimation of the amounts collected (6).

(1) The Latvian Environment Agency has developed, within the framework of the Phare multi-country project on municipal waste, a handbook on conversion rates between volume and weight for different waste types and also compression factors utilised in specific waste collection trucks. This handbook will soon be available on the Eurostat web site.

(2) The application of the European list of wastes for municipal wastes does not seem to be enormously difficult because only a few categories are available. But there must be specific activities carried out like 'bulky waste collection' and 'street and park cleaning' and these activities must be reported. Also the differentiation by sources requests the implementation of difficult or expensive organisational procedures like splitting up of collection routes, waste bookkeeping during waste collection or analysis of waste contracts.

(3) This is the case for most of the data on the composition of mixed municipal waste reported in the joint questionnaire which represent an extrapolation from singular studies to the national level.

(4) Municipal waste collection is carried out under legal control requesting permits and/or licenses. For each municipality, the enterprises carrying out the waste collection should be well known. Therefore it should be theoretically possible to receive a complete list of waste collectors from the municipalities.

(5) The Statistical Offices of Estonia and the Czech Republic have carried out, within the framework of the Phare multi-country project on municipal waste, pilot projects for the identification of waste collectors and the information available at their side.

(6) It should be mentioned that the identification of waste collectors is difficult but less difficult than the identification of waste generators. In its first survey for 2001, the Latvian Environment Agency arrived at a much higher amount of waste collected than waste generated because they were not able to survey enough waste generators.

Results

The results of the harmonised data collection via the joint questionnaire must be seen alongside the restrictions with regard to quality and quantity identified above.

Amount generated/collected per capita

The amount of waste generated per capita varies between about 300 and 600 kg per inhabitant. Countries with high rates (Bulgaria, Malta, Cyprus and Slovenia) have reached a relatively high welfare situation, are influenced by tourism or are unable to separate construction and demolition waste from municipal waste (Bulgaria).

Time series on waste generation/collection

The development with regard to municipal waste generation/collection is difficult to interpret. The countries which have applied the same survey methodologies (Estonia, Slovakia, Poland, Czech Republic, Bulgaria and Hungary) for years or decades do not mostly show any considerable development - except Poland where a significant decrease of municipal waste collected did take place between 2000 and 2001. This decrease might be related to the strongly enforced establishment of separate waste fractions collection systems.

The relatively strong developments shown for some countries (Latvia, Lithuania, Slovenia and Romania) do not primarily reflect developments on waste generation but the efforts of countries to come closer to the reality of waste management. In 2001, Latvia introduced a new survey system; data delivered before were only estimations. In 2000, Romania and Lithuania also started to introduce new survey systems. In addition, they have to face the problem of non-covered areas followed by uncertainties or estimation problems with regard to waste generation. Finally, Slovenia has only carried out two surveys up to now with quite big periodicity (1995 and 1998) not allowing any conclusions with regard to development.

Cyprus and Malta are in quite different situations but show the same stability on waste generation over the last few years. Malta, with two landfills for municipal waste with accurate weighing at the entrance and very detailed figures on waste input publicly available, has a solid basis for the determination of the totals. Therefore no rapid development can be expected.

Cyprus first carried out a survey in 2001 and estimated the previous years with reference to population. The development therefore shows, above all, the population development.

Composition of municipal waste

Despite some big differences on some fractions of mixed municipal waste (percentages range from 32 % for organic material in Slovenia to 60 % in Malta) the percentages for fractions which could be collected separately (paper, textiles, plastics, glass and metals) are not so different.

Collection of separate fractions

Only five countries (Czech Republic, Estonia, Latvia, Slovakia and Poland) supply Eurostat with national figures on separate waste collection. Slovakia has built up the most effective systems (the amount collected separately has risen to more than 14 %). For the Czech Republic, Estonia and Latvia the respective percentages are about 5 % of mixed municipal waste. For Poland less than 2 % are separately collected, but this is in the process of changing.

Outlook

Situation of waste management in the candidate countries

Waste management in the candidate countries needs still further development despite the enormous efforts undertaken in the past. The situation which confronts the candidate countries is enormously demanding because they have not only to reach a certain stage of development already achieved by EU Member States but have also to reach the difficult and costly objectives as formulated in the landfill directive which even most EU Member States have not yet attained.

Before tackling the huge problems of waste management, it must be stressed that the candidate countries have themselves prepared almost perfectly with regard to legislation. They have either totally implemented EU waste legislation already or are quite near to this situation (1). This means that the legislative conditions are in place for adapting national waste management to European law.

Although the situation is quite different from country to country, important general problems, relevant to most of the countries, should be noted.

Most countries have to face the following crucial waste management problems:

- treatment and disposal facilities are not completely established and equipped according to the conditions formulated in the EU waste framework directive;
- treatment and disposal is restricted to landfilling;
- the systems established for municipal waste collection services are not covering the whole country and/or not collecting separate fractions.

The waste management problems listed above are dealt with by a developing administration still under construction. The following points can be seen as the main administrative problems:

- regional and municipal authorities dedicated to the supervision of waste collection, treatment and disposal have not yet been completely established or the operators have not yet been recruited;
- the registration of enterprises carrying out waste management, which is requested by national law, has not yet been completed (2);
- the administrative handling of the enterprise documents (licenses, waste declarations and waste reports) has just started and consequently supervision is still just developing.

Statistics on waste management

Both sets of problems mentioned above refer primarily to the quality of waste management and its effective supervision. But these dimensions also decisively affect the availability and quality of information on waste. In this regard, two fields have to be differentiated: waste generation and waste treatment.

Availability of information on waste generation:

According to the definition of waste mentioned in Article 1(a) of Council Framework Directive 75/442/EEC (3), 'waste' is generated if a certain substance is discarded, if the intention to discard exists or discard is required. For private households and small enterprises this means that they have generated waste when they have disposed of substances or goods (no longer for use) outside their home or office. For other enterprises, especially for big companies which are storing (temporary) or disposing of substances nearby the production facility, the first question is if these materials constitute waste or some other material, for example, substances for further production or by-products, etc.

Information on waste generation has, in principle, three different sources which have to be combined in a certain way - according to national law and/or national preferences - to calculate and determine the total quantity generated (4):

- waste collected (either by municipalities or on behalf of them or by private enterprises (5));
- substances generated as unwanted by-products, declared as waste and stored on site or transported for treatment or final disposal;
- wastes brought directly to treatment or disposal facilities (either by private persons or enterprises).

Most countries utilise only one source for the determination of waste generation. EU Member States like Denmark and Germany calculate waste generation from the treatment side. The implicit assumption is that all wastes end up at legal treatment sites. However, if, for example, only the municipal waste collection system is utilised as a source for the determination of the municipal waste generated then small enterprises and private households which discard their waste by themselves are neglected. This will not only reduce the amount but will also hide a certain unfavourable and slightly dangerous situation.

Apart from the case where it is generally difficult to determine the total amount of waste generated in a certain period and for a certain region (6), additional difficulties exist specific to the accession countries.

(1) This remark refers to the general legislation. Technical instructions necessary for the execution of the legislation are not considered.
(2) It must be mentioned that the complete registration is a never-ending intensive task because registers have to be permanently or periodically updated as enterprises are closed down, newly created or renamed.
(3) Amended by Council Directive 91/156/EEC of 18 March 1991.
(4) If different sources are combined to determine the total amount of waste generated a certain overlapping (wastes are counted twice) followed by an overestimation can be the consequence.
(5) This also includes collection systems established on municipal, regional or national level for the organisation of the collection of separate waste fractions.
(6) The general difficulty results from the problem of discriminating between waste and non-waste.

- Not all enterprises are registered and the waste amounts generated by non-registered enterprises are not counted.
- Enterprises store waste (sometimes not even following legal rules) at their premises without any declaration.
- Not all regions or areas are covered by an organised municipal waste collection system.
- There are (still) 'traditional' collection systems for separate waste fractions which are not covered by obligatory reporting.

All the four specific difficulties listed above, which impede the determination of the total amount of waste generated also exist, at least partially, in EU Member States. They lead to an underestimation of the waste generated (1).

Availability of information on waste treatment and disposal:

Initially it seemed that information on waste treatment and disposal in the accession countries could be easily gathered. This impression is derived from the fact that there is almost no treatment and disposal facility type other than landfilling. This is the case but the situation is rapidly changing. Landfilling is concentrated in big units which are upgraded while small and non-favourable landfills are closed, treatment facilities are being planned and preparations for the fulfilment of the EU landfill directive have started. Therefore the following questions are of interest:

- What have the countries done concerning restructuring of landfilling and
- Which binding plans have they started?

Expected development on municipal waste information

Any development towards further improvement of waste information - and in the following of the information supply to the EU Commission - depends first of all on the change of certain conditions which can only to a very small part influenced by Statistical Offices in their routine work.

To change these conditions the following activities or developments must be carried out or envisaged.

- Research on waste composition (2);
- Development of waste bookkeeping by enterprises (3);
- Establishment of new waste management processes (4).

In addition to the change of conditions which can only be the result of the implementation of waste policy, statistical offices and comparable institutions (like the Estonian Environment Information Centre) have some possibilities to improve the data situation on municipal waste.

- Statistical Offices can improve and update their list of waste collectors (municipalities and private enterprises) (5);
- Statistical Offices can survey in detail the information which is currently available at the side of municipal waste collectors (6);
- Finally Statistical Offices can wait for the further development of waste information resulting from control and supervision of waste management (handled by Environment Ministry and the subordinated authorities). There are at least 5 Accession Countries (CZ, HU, LT, PL and SK) which are strongly progressing towards the establishment of harmonised integrated waste information systems. Statistical Offices will have mainly the role of being (first) recipient of the compiled and aggregated data sets.

Improvements which can be reached by Statistical Offices (and comparable institutions) on the basis of own expertise, are of course not the result of routine work. Either Statistical Offices need additional resources or they need help from other units in their office (e.g. inclusion of additional questions on waste in a business survey or other surveys (7)).

Bulgaria

Waste management

Coverage of organised waste collection

About 80 % of the population in 2000

Landfilling

The only applied waste treatment and disposal method. Operating landfills, with a few exceptions, do not comply with modern requirements.

Other treatment methods

Not yet existing. There are no municipal waste incinerators and composting plants in the country.

Separate waste fraction collection

No successful attempts up to now.

(1) The level of underestimation is not known and, as a result, comparisons between different regions or nations are problematic.
(2) The determination of the composition of mixed municipal waste requests at least as scientific tool the application of analytical statistics.
(3) The differentiation between sources for municipal wastes (Households etc.) and the accurate differentiation by waste types can only be done on the basis of continuous enterprise waste bookkeeping
(4) The establishment of 'new waste management facilities' like 'separate collections systems' and 'waste treatment facilities' are requesting of course an intensive planning phase and huge financial resources.
(5) Statistical Office Estonia did improve its register on municipal waste collectors in the frame of a pilot project.
(6) Statistical Office of the Czech Republic has surveyed the municipalities to get a comprehensive view on waste collectors and information available at this side in the frame of a pilot project.
(7) Estonian Statistical Office introduced waste questions with relation to consumption and packaging in the household survey for the estimation of waste in areas not covered by municipal waste; Czech Statistical Office introduced questions referring to municipal waste collection in a country wide survey on wastewater treatment.

Waste management planning

Waste management plans

At present 250 municipal waste management programmes (92 %) are approved and presented to the Ministry of the Environment and Water (MOEW).

Landfilling

The national waste management programme envisages the construction of 37 regional landfills which will serve about 33 % of the population, the establishment of a national hazardous waste disposal centre and a system of regional landfills for hazardous waste.

Waste statistic sources and expected development

National Statistical Institute (NSI)

Topics: Household, construction and industrial waste. Two annual surveys on waste generation and destination. The survey on municipal waste, construction and demolition waste is referring to the municipal administration and landfill operators, and the survey on industrial wastes to relevant enterprises.
Remarks: The register of the National Statistical Institute is used for determination of reporting units. It does not contain information on all registered enterprises – about 6 500 units are registered.

Executive Environmental Agency (EEA)

Topics: The Executive Environmental Agency collects and processes data on hazardous waste and on the other types of waste specified in the RHIWEA and Regulation No 10 from 1998.
Remarks: Until 1998 inclusive, the monitoring of industrial waste was carried out according to the National Statistical Institute nomenclature that included 82 types of waste. In 1998, a nomenclature harmonised with the European waste catalogue (EWC) was introduced.

Regional activities

Topics: the results of different investigations on the composition of municipal solid waste show extreme differences with regard to average waste arising per capita/year and particular differences for certain components in MSW such as plastics and metals.

Development

Further development of waste statistics depends on the improvement of the Business Register of the Statistical Office. The Business Register must be improved in two directions: Inclusion of additional enterprises not yet registered and specification and identification of private enterprises involved in municipal waste collection This extension or improvement of Business Register seems to be the precondition for further improvement of waste statistics. This activity cannot be carried out with own resources in the Environment Statistics section. Further development depends therefore on combined activities to be launched in the Statistical Office.

Czech Republic

Waste management

Coverage of organised waste collection

Complete coverage.

Landfilling

Landfilling is still the most extensively used method of waste disposal. In 2001, 161 landfills for municipal waste and 46 ones for hazardous waste were in operation. These are exclusively landfills of a high technical standard, in line with EU requirements. Several large landfills are equipped with methane collection technology.

Other treatment methods for non-hazardous wastes

Municipal waste is incinerated in 75 combustion facilities. In the year 2000, 23 % of non-hazardous industrial waste was used as a secondary raw material, 1.7 % recycled, 20 % treated with biological methods, 25 % landfilled and only 1.9 % incinerated. Co-incineration in cement plants is a common method of energy recovery. In 1999, 100000 tonnes of plastic, 18000 tonnes of tars, 12000 tonnes of waste oils and 4000 tonnes of solvents were used as a substitute fuel in cement plants. Another 8000 tonnes of solvents were incinerated in ironworks.

Other treatment methods for hazardous wastes

Hazardous waste generated by enterprises in the year 2000: 35 % was used as a secondary raw material, another 1.5 % recycled, 10 % had to undergo a chemical treatment, 8.9 % a biological decontamination. 12 % was deposited in landfills, 4.6 % was sent to underground deposition. Only 1.7 % was incinerated, energy recovery in this process was common. The five major hazardous waste incineration plants are operated by industry. There are refineries for the extraction of lead from lead batteries. The collection rate for this kind of waste stands at about 80 %.

Separate waste fraction collection

Two years after its foundation EKO-KOM, a company association to recover packaging waste, has come to cover about 60 % of the population of the Czech Republic. The collection rates in the first quarter of 2001 were 66 % for glass containers, 57 % for paper packaging, 19 % for plastics and 7 % for metal scrap. This represents in total about 40 % of all packaging materials. EKO-KOM estimates that in 2005, 53 % of all packaging waste will be recycled and 59 % recovered.

Waste management planning

Waste management plans

The Ministry of the Environment considers it necessary to prepare waste strategies in accordance with the requirements of the EU directives. According to the new Act on Waste, national and regional waste management plans must be elaborated. The first national waste management plan has to be prepared by the end of 2002. Special attention is given to more effective collection, storage and reprocessing of used oil, batteries and accumulators, fluo-

rescent tubes and discharge lamps, tyres and used packaging.

Waste policy

Guiding principles of the Czech waste policy are: prevention of waste generation, increased information for the implementation of economic instruments, and the development of effective product take-back systems. Economic tools are considered to be very efficient. Customers and enterprises can employ a lower VAT rate of 5 % for recycled paper and the production of biogas. Properties and structures used exclusively for recycling purposes are exempt from property taxes.

Waste statistics sources and expected development

Czech Statistical Office

Topics: Annual survey on industrial and municipal waste.
Remarks: Responding units are about 600 random sampled municipalities with at least 200 inhabitants and all enterprises with at least 20 employees. (For NACE 90 the threshold is five employees.) For waste of every code, each company has to provide information about its generation in tonnes and its disposal method. The treatment costs are surveyed as well. In September 2002, all municipalities have to take part in a census of water supply and sewerage systems (Vak 2002). The Statistical Office plans to include a short annex on municipal waste. All cities and communes have to answer which parts of municipal waste are collected separately, and which companies are in charge of the collection, transport, sorting, recycling and removal of municipal waste and its hazardous components. The results are compiled in the pilot project.

Ministry of the Environment

Topics: There is no information available on how the information chain via enterprise reports is compiled.

Development

The Czech Statistical Office is collecting already with 2 surveys on industrial and municipal waste nearly all information necessary to fulfil the reporting obligations in the forthcoming waste statistics regulation. The only 'problem' is the introduction of European list of wastes which did take place quite recently for the reference year 2001. The degree of adaptation of the enterprises and the possible problems are not known at the moment. The information on hazardous waste will be included in the reporting.

Hungary

Waste management:

Coverage of organised waste collection

85.1 % of population are covered.

Landfilling

In 2001, Hungary had 728 registered sanitary landfills, of which one for hazardous waste. A great number of low capacity local landfills are not in conformity with EU regulations, and there are an estimated 2000 illegal ones.

Other treatment methods

The country has at its disposal 53 incinerators, one of which is used exclusively for municipal waste. 81 % of them are compliant to EU regulations.

Separate waste fraction collection

Lead batteries are collected separately. Every year 18000 tonnes are exported to Slovenia for recycling. A consortium of communal service enterprises collects packaging waste. This activity is financed from product charges and occasionally from the Environmental Protection Fund. A deposit refund scheme covers some alcoholic drink bottles plus glass and PET bottles for soft drinks.

Waste management planning

Waste management plans

The principles of waste management are fixed in the Act XLIII on waste management. Some important goals are the prevention of waste generation, the utilisation of renewable resources, the design of reusable products, the production of goods with a long life cycle, the reduction of quantity and hazardous nature of waste, waste recovery, and the disposal of non-reusable and non-recyclable waste in an environmentally sound way. According to the act the manufacturer will have to take back specified used items.

Landfilling

By 2003, all landfills are planned to be inspected. The content of biodegradable organic material in waste disposed of in landfills shall be reduced to 75 % by 1 July 2004 and to 35 % by 1 July 2014. Waste disposal facilities at municipal level and for hazardous waste have to be extended.

Separate waste fraction collection

Hazardous waste generated in households shall be collected separately at the expense of the producer. All waste gathering activities and disposal installations are subject to permits issued by the environmental authority.

Waste statistics sources and expected development

Central Statistical Office (KSH)

Topics: Annual survey on municipal waste.
Remarks: KSH commissions the Regional Statistical Offices to send a questionnaire to all the municipalities and the enterprises dealing with municipal waste collection and treatment.

Ministry for the Environment

Topics: Annual data collection on hazardous waste.
Remarks: Data collection in cooperation with the Institute for Environmental Management and the 12 Regional Environmental Inspectorates.

Ministry for Economic Affairs

Topics: Annual data collection on non-hazardous industrial waste.

Remarks: Designated enterprises of production, research and development have to reply to the questionnaire. The European waste catalogue is partly used.

Regional activities

Topics: The Regional Environmental Inspectorates feed the results of their monitoring activity into regional registers which provide the basis for the National Environmental Protection Information System. They also compile data on the number of licenses issued, and report on implementation and legislation problems.

Development

Hungary has started in autumn 2002 a one year project financed by 'Europeaid' to build up an integrated information system with regard to waste flows for waste control and waste reporting. In the frame of the PHARE Multi Country project 2000 on waste management there was in addition defined a project together with the Environment Ministry of Hungary to establish a special reporting device attached to the waste information system (interface construction). This reporting device will allow to aggregate and compile the necessary reporting data in an automatic manner.

Hungary seems to be extraordinarily well prepared to solve the different EU and other international reporting obligations in an efficient and modern way. It will be interesting to follow and learn from the process of development and application of the integrated tool. It must be kept in mind that in several EU Member States 'isle solutions' are preferred.

Estonia

Waste management

Coverage of organised waste collection

In 2000, 69 % of the population was covered by waste collection

Landfilling

Regarding waste disposal the generated amounts of waste are commonly deposited in landfills (82 % of the total amount of waste). In 2000, there were 351 landfills in Estonia, 180 landfills were used for disposal of which 148 were landfills for mixed municipal waste, 22 industrial landfills and 10 animal tissue waste landfills.

Other treatment methods

Waste is incinerated to a very limited extent. Some 164000 tonnes of waste were incinerated in 2000, of which 94 % with energy recovery. The wood waste made up the majority of incinerated waste while only 0.02 % of the collected municipal waste and 3100 tonnes of hazardous waste were incinerated.

Separate waste fraction collection

A nationwide system of waste sorting and separate collection has yet not been established in Estonia. In several cities, containers for separate waste collection have been made available to a limited extent. Packaging waste like glass bottles, paper, cardboard and plastics, are the main collected items. Since 1995 the collected amounts of wastepaper, glass and plastics have increased. Increasing amounts of wastes of ferrous metal and lead have been collected mainly for exports.

Waste management planning

Waste management plans

According to waste management legislation, sub-national waste management plans should be adopted according to following schemes:

- regional waste management plans one year after the adoption of the national waste management plan (revised every five years);
- municipal waste management plans as a part of the overall management plan (taking into account the regional waste management plan).

Several regions have already completed their waste management plans but only one of them has legal status and is available to the public.

Landfilling

Qualitative targets are set for the year 2010. The number of municipal landfills should be optimised.

Waste statistics sources and expected development

Central Statistical Office in cooperation with Ministry for the Environment and Environment Information Centre

Remarks: One survey on waste management (Jäätmekäitlus) has been carried out up to now in Estonia. The questionnaire for this survey has been developed in the Statistical Office in cooperation with MoE and EEIC and the distribution to the enterprises is under the responsibility of the regional environmental authorities. The survey has been carried out annually since 1992. The questionnaires are sent out in the beginning of January and the answers are received in February. The results of the survey are compiled in EEIC and approved by the Ministry of the Environment. The final results are submitted to the Statistical Office of Estonia including individual data.

Waste classification

Topics: Since December 1998 a new classification system for the surveys on waste management has been used which is harmonised with EU classification. Data are available starting at 2000 with an EWC and EWCStat breakdown.

Development

In Estonia exists a quite intensive and well balanced cooperation between the Statistical Office and the Estonian Environment Information Centre (EEIC) with regard to questionnaire development and handling of replies. In addition Estonia is belonging to the countries which have already collected experiences with the application of EWC and also with EWCStat. The problem waste statistics is facing in Estonia is before all the less developed system of waste management. Not all villages and even not all districts in municipalities are covered by municipal waste collection services In addition a lot of waste generating enterprises

seems not to be registered in the EEIC with the consequence that they are not included in the annual waste survey. Also some waste fractions like waste oils seem to disappear instead of ending at waste treatment facilities. The Estonian Statistical Office in co-operation with EEIC is undertaking enormous efforts to help in solving waste management problems and to increase as secondary effect the quality of data: Statistical Office has started a project to identify waste generating enterprises which are up to now not registered in EEIC register. Also Statistical Office has developed proposals to introduce waste bookkeeping in waste collection enterprises and to give advice to modify the waste collection routes.

Latvia

Waste management

Coverage of organised waste collection

In average, waste collection services are available only to about 60 % of residents, and as a result waste is dumped in forests, along roadside, beside water bodies and other illegal sites.

Landfilling

Most of the municipal solid waste and other collected wastes are deposited without pre-treatment at one of the numerous dumpsites, which are very varied in size, across Latvia. In 2001 about 250 dumps were permitted to operate and accept waste. Approximately 40 % of the waste collected is disposed of at the Riga (Getlini) landfill. Waste registration takes place only at landfills used by the biggest cities. Usually only volume units (m^3) are used for waste registration.

Other treatment methods

At present the capacity for recycling, reuse and recovery of packaging in Latvia is very limited. Some facilities exist for metals, glass, paper, cardboard, and PE recycling, but these are not currently operating at full capacity or on any significant scale. Regarding end-of-life vehicles, around 90000 vehicles are deregistered each year. These are currently processed for the recovery of spare parts and recyclable scrap metals for export, generally in unlicensed and poorly managed facilities. Used tyres are mostly landfilled although some are accumulated/stored and used for energy recovery in cement kilns. The majority of waste oil and oil emulsion arising from enterprises and activities in-land is currently burnt. In addition, waste oils routinely arise from oil spillages from the railways. The waste oil that is collected from this source tends to be burnt as fuel. No system exists for the removal of oil-contaminated soil in relation to these spillages.

Separate waste fraction collection

Regarding packaging and packaging waste Latvia has a collection system based on an agreement signed between the Ministry for the Environmental Protection and Regional Development (MEPRD) and voluntary associations of companies that produce or use packaging.

Waste management planning

Waste management plans

The national waste management strategy of Latvia is outlined in the National Strategy for the Management of Municipal Waste, 1998–2010 and in the National Hazardous Waste Management Strategy, 1999-2004. For complementing and building upon these documents a (draft) multi-year waste management plan for the years 2003 to 2015 was elaborated in 2001.

Landfilling

Presently landfill sites for the disposal of hazardous waste are lacking and facilities for reprocessing or treatment are limited. Therefore, hazardous waste which cannot be reprocessed must be stored in the territory of enterprises. As a result, about 1500000t of hazardous waste which require reprocessing or treatment have now been accumulated in enterprise territories.

Other treatment methods

The Latvian Government intends to establish a semi-mobile incineration unit for the high-temperature incineration of combustible hazardous wastes, which shall be in operation in 2002. Furthermore, the construction of a physico-chemical treatment and stabilisation facility (to be established within the next three years) and a landfill site for the disposal of certain hazardous wastes is planned. The first stage of the landfill is expected to be in operation in 2004, and the second stage after six to seven years. Its total capacity per annum is planned to be up to 40000 tonnes.

Waste statistics sources and expected development

Latvian Environment Agency

Topics: Hazardous waste and municipal waste.
Remarks: Presently in Latvia statistical surveys are carried out only on hazardous waste. There is no regular reporting system for municipal waste, mainly due to the fact, that collection of information in this domain is not obligatory.
Key actions to be implemented until the end of 2003:

- impose a legal obligation on major waste producers to monitor and keep records of the quantities and types of waste generated;
- introduce a legal obligation to install/operate weighbridges at all major waste management facilities;
- implement a national system and related procedures for classifying, collecting, processing, analysing and disseminating data and information on the sources, nature, quantities and fate of wastes, and waste management facilities;
- conduct a study/investigation of the composition of municipal solid waste including commercial and institutional wastes;
- prepare a comprehensive inventory of PCBs/PCTs [(1)] waste sources and quantities;
- prepare a comprehensive inventory of POPs [(2)] and other dangerous chemical sources and quantities.

Development

The Environment Agency of Latvia made 2001 the first time surveys on waste generation and collection of municipal waste [1] including 284 collectors and 618 waste generators. The result seemed to be non logic (Amount collected higher than generated!), but is showing first of all that not all waste generators are included in the survey. For 2002 a decisive improvement can be expected.

Lithuania

Waste management

Coverage of organised waste collection

About 50 % of population.
Landfilling
Most of the generated waste is deposited without pretreatment at one of the numerous landfill sites. The total number of landfills for municipal solid waste is 800 including contaminated sites and liquid waste reservoirs. About 85 landfills have a capacity over 25 t/day. There is one landfill for the disposal of hazardous waste and a second under construction.

Other treatment methods

About 48 % of hazardous waste was processed in year 2000 especially waste oils.

Separate waste fraction collection

A nationwide system of waste sorting and separate collection has not yet been established. In several cities, containers for separate waste collection have been made available to a limited extent. Packaging waste like glass bottles, paper, cardboard and plastic are the main collected items.

Waste management planning

Waste management plans

Draw up county and municipal waste management plans by the end of 2002.

Landfilling

Reduce the number of landfills to 30 by the year 2010.

Other treatment methods

Design and construct a hazardous-waste incineration facility and a long-term safe landfill for hazardous waste, develop a system for the management of hazardous hospital waste by 2004.

Separate waste fraction collection

Implement the Programme for the Processing of Secondary Raw Materials (creation of a modern system for the sorting of secondary raw materials in conformity with the EU requirements, introduction and upgrading of technologies designed for the processing of secondary raw materials) by 2004.

Waste statistics sources and expected development

Ministry for the Environment

Topics: Waste data and reporting system according to the Waste Management Rules (WMR).
Remarks: The waste information collection in Lithuania is regulated in the Waste Management Rules (WMR). With the approval of WMR in 1999 a new waste data and reporting system was established which replaced the old one existing from 1993 for collection of statistical data on waste. The main features of the new waste data collection system are: a new waste classification, based on the EWC, registration of waste management undertakings, recording of waste generation and treatment by industries and waste management undertakings as well as reporting of disposal, recovery and recycling by waste management undertakings.

Waste classification

The waste classification used in Lithuania is presented in Annex II of the WMR. It was prepared in accordance with the European waste catalogue and the List of Hazardous Waste.

Development

Similar to Hungary Lithuania is preparing the establishment and implementation of an integrated waste information system. The 'automatic' waste reporting foreseen is according to the Draft Council Regulation on waste management Statistics COM(1999)31 final, which was not adopted but simplified with the forthcoming Waste Statistics Regulation.

Poland

Waste management

Coverage of organised waste collection

Not exactly known.

Landfilling

Landfilling is the major disposal route for all categories of waste although waste incineration takes place to some extent. From Poland a total number of 998 landfills for municipal waste and 68 landfills for hazardous waste was reported.

Other treatment methods

Only the important dismantling of end-of-life Vehicles can be added to what is mentioned under landfilling and separate fractions collection.

(1) PCBs: PolyChlorinated Biphenyls; PCTs: PolyChlorinated Terphenyls.
(2) POPs: Persistent Organic Parts.
(1) It must be mentioned that according to the Latvian waste Legislation municipal waste is defined as non hazardous waste including household waste etc. and non hazardous industrial waste. Also the EWC is not yet introduced in Legislation.

Separate waste fraction collection

Regarding separate collection and recycling in 1999, developed systems for metals, paper/cardboard and end-of-life vehicles (ELV) existed. In addition, collection and/or recycling of batteries, waste of electrical and electronic equipment (WEEE), oils, packaging, glass, plastics and tyres was taking place to some extent.

Waste management planning

Waste management plans

In Poland the national waste management strategy and implementation plans are elaborated in two documents: 'Strategy for Balanced Development in Poland till 2025' and especially 'The Second National Environmental Policy'. The following perspectives are mentioned: Short-term priority objectives (the period between 2000–2002): Development of a waste management strategy and waste management plans at national, regional and local levels, the implementation of a comprehensive registration system of wastes and waste management methods (database), and the preparation of a suitable waste register, including a regular report on waste management, both for the domestic needs and those of the European Union.Medium-term perspective (the years 2003–2010): Full implementation of requirements set out in the specific EU waste legislation, e.g. country-wide selective collection systems for particular waste streams (waste oils, used batteries, packaging waste) including hazardous waste as well as an effective monitoring system including control and register of waste.

Waste statistics sources and expected development

Central Statistical Office (GUS)

Topics: Annual surveys on industrial and other waste (Form OS-6) as well as surveys on municipal waste (Form M-09).
Remarks: The Agricultural and Environment Statistics Division is responsible for the survey on industrial waste. All enterprises (publicly and privately owned), that generate annually more than one thousand tonnes of industrial and other waste covered by classification (excluding municipal waste) or enterprises having one million and more tonnes of waste gathered on their own area have to reply. The survey on municipal waste is in the responsibility of the Production and Services Statistics Division. Data are collected through regional statistical offices located in the voivodships. The Form M-09 has to be filled out by all units involved in the activity of cleaning streets and squares, disposal of solid and liquid waste from residential sites, including waste treatment.

Inspectorates for environmental protection supervised by the Ministry of the Environment

Topics: Hazardous waste data collection.
Remarks: Data collection on hazardous waste in the framework of the State Environment Monitoring System (waste subsystem). The inquiry on hazardous waste concerns all units generating annually more than 30 tonnes of hazardous waste and 10 % of other (less than 30 tonnes) hazardous waste producers. They have to hand over their reports to the Inspectorates for Environmental Protection on voivodship level.
Regional activities
Topics: Due to the planned simplified system generators of waste have to prepare at the end of every year questionnaires covering the description on waste generation and management and send them to the 'marshalships' at regional 'voivodship' level. In addition, the enterprises collecting municipal waste will elaborate their own inquiries, and responses are to be sent out to the Marshalships as well. Then, finally, the aggregated data are expected to be sent to the Ministry of the Environment.

Waste classification

Topics: Since January 1998 a new classification system is used for the surveys on waste which is harmonised with EU classification.

Development

Statistical Office (GUS) has long experience with waste statistics and is carrying out in two different units 2 high quality surveys on municipal waste and industrial waste. Despite this, Ministry of Environment has decided to build up a waste information system based on information collected at 'Voivodship'- level on the topics waste generation, collection and treatment. Hazardous waste management will also be included in this reporting system. It is assumed that both information collection activities will be kept parallel for some few years. After this period the statistical surveys should end. It is not decided in which way the GUS will be involved in mid term future in waste statistics. Also the establishment of the waste information system is not yet in the phase where the results with regards to the fulfilment of the waste reporting obligations are clearly visible.

Romania

Waste management

Coverage of organised waste collection

Only 9.5 million inhabitants (42 %) of the total population are covered by collection services. The waste from areas without collection is usually disposed of on local dump sites.

Landfilling

Landfilling represents the main disposal option for industrial and agricultural waste, being applied for around 70 % of the total generated waste. At present, 951 industrial landfills are used in Romania covering a total area of around 12000 ha. Most of them (354) are not especially engineered, but there are also mining waste deposits (251) and lagoons (209) which have some facilities. Only 30 % of the industrial landfills operate on the basis of a licence. All the other landfills do not own an operating licence, although several such landfills are located inadequately and are not monitored at all. For example, 34 % of the industrial landfills are sited within town limits, while 6 % of the industrial landfills are located nearby river banks. Only 60 % of the landfills are sited outside localities. More than 90 % of generated MSW is disposed of by landfilling. At least one desig-

nated site for waste disposal exists in each urban or rural area, but there are cities where two or more landfills are in operation (Bucharest, Oradea).

Other treatment methods

At present, there are around 400 companies authorised as required by the Emergency Ordinance 15/2001 approved by the Law 426/2001 referring to the recovery of recyclable waste (ferrous and non-ferrous metals, paper/cardboard and plastics) in order to be sold as secondary raw materials.

Separate waste fraction collection

Pilot projects on selective collection have been developed in some localities by organising collection points where people could bring (with or without payment) waste paper, glass, or plastic bottles. Information presented by the Ministry of Industry and Resources shows 2500 waste collection points were in operation in the year 2000.

Waste management planning

Waste management plans

There are two recently finalised documents relevant for waste management planning, the National Strategy on Waste Management and the National Action Plan for Waste Management. Both documents are drafts. The National Waste Management Strategy expresses the national concept of implementing the EU legislation in the waste sector. Romania is expected to transpose and fully comply with the directives by 2007 except for the three directives for which transitional periods have been requested (landfill, incinerators and packaging). The national action plan for waste management will create the legal framework for the accomplishment of tasks enumerated in Romania's position document, by presenting actions and planning to fulfil the strategic objectives in the waste sector.

Waste statistics sources and expected development

National Research Institute for Environmental Protection (ICIM)

Topics: The annual waste statistics with a new set of questionnaires established for the year 2000.
Remarks: The questionnaires are sent to waste producers, waste management companies and municipalities in each county ('judet') in Romania by the 42 local Environmental Protection Inspectorates (EPIs). Operators, to which the questionnaires are sent, are selected by the local EPIs, based on the environmental impact of the companies, thus including all relevant actors. In 2001 about 6000 companies were addressed.

National Waste Management Centre (WMC) to be founded

Topics: According to a proposal in the national strategy, a National Waste Management Centre will be established and responsible for developing and improving the existing national waste management information system.
Remarks: Main tasks for the NWMC:

- maintenance and updating databases on waste generation and management in general, on specific waste flow generation and management (packaging, PCBs/PCTs, batteries/accumulators) and waste management facilities (landfills, incinerators, composting plants);
- monitoring the quality of different wastes (by types of waste – urban, production or hazardous waste);
- the Centre will participate in the elaboration of standards, guidelines or rules of good practice, and will assure consultancy services for establishing appropriate solutions for management of different waste types. It will be possible that some specialists in waste management within ICIM will represent the initial team of this centre.

Development

The National Statistical Office is only involved in the elaboration and further development of the questionnaires to be sent to waste management enterprises. The whole processing (distribution to enterprises, handling of replies and compilation of statistics is in the hands of ICIM and the 42 regional Inspectorates).
ICIM has developed for the year 2000 a new questionnaire covering all questions on waste management with relation to Joint Questionnaire and also the forthcoming Waste Statistics Regulation. The remaining problem, which will be solved in the next years is to include all relevant enterprises into the surveys.

Slovakia

Waste management

Coverage of organised waste collection

Complete.

Landfilling

Municipal waste was disposed of in 141 landfills. In the same year 159 landfills were closed due to their non-compliance with modern standards. The landfill capacity is sufficient for about 100 years.

Other treatment methods

In 2001, the country had at its disposal two municipal waste plus 69 hazardous waste incinerators. In order to give advice to producers of hazardous waste, the Slovak Environmental Agency (SEA) has established a Hazardous Waste Information Centre. In Slovakia, there are plants for solvent recycling, energy use of waste oils, waste oil treatment for energy use, neutralisation of acids and bases and the recycling of lead accumulators. An important problem is the lack of incineration capacities.

Separate waste fraction collection

In 1999 1.1 million tonnes of scrap iron were recycled. Also waste rubber and tyres, non-ferrous metal, textiles, plastic and sawdust were used as a secondary raw material. The Slovak Republic makes a huge effort to collect household waste containing harmful substances separately. In 1999, 718.6 tonnes were collected, more than half of that amount was recycled. For medical waste, the inhabitants find special containers at every chemist's. The recovery of waste paper has doubled from 1993 to 1999. Slovakia even imports waste paper in order to be recycled.

Waste management planning

Waste management plans

In 1993, Slovakia was one of the first central and east European countries to adopt a national waste management programme. By 1996, 159 regional waste management plans involving concern more than 12000 waste generators, had been set up. One of the programme's aims is to create economic instruments encouraging cleaner technology, waste recovery and the design of recycling-friendly products. Packaging waste that cannot be recycled, should be minimised. If recycling is not possible, hazardous waste must undergo a treatment before its disposal. The measures of the programme have to be implemented in three steps: from 1994 to 1997, from 1997 to 2000, and from 2000 to 2005.
Landfilling and other treatment
For the period from 1997 to 2000, the programme envisaged, for example, the construction of a landfill for hazardous waste and at least one supra-regional hazardous waste incinerating plant, the use of cement production for the disposal of some kinds of waste, the increase in the share of composted waste and the disposal of all municipal waste in landfills meeting technical conditions.

Waste statistics sources and expected development

Central Statistical Office

Topics: Statistical survey on waste based on the Concepts of monitoring the environment of the Slovak Republic.
Remarks: The Statistical Office carries out two annual surveys on waste, which are based on laws on the State statistics. One of them is about waste in general. It distinguishes between special, hazardous and other wastes. Reporting units are enterprises with 20 or more employees, which are asked about the waste amount in specified categories and the way it is handled. The other survey focuses on municipal waste. Reporting units are the cities and communes of the Slovak Republic. The municipalities must provide data about the generation of household waste, other waste similar to household waste, bulky waste from households and from municipalities, septic and cesspool waste, street sweepings, greenery waste and separately sorted hazardous waste from households. The towns and communes must also state which amounts of waste are utilised, disposed of or treated in another way. The questionnaire contains a module about separate collection of paper, glass, textile, plastics, metals, biowaste, hazardous substances and others, but it is not obligatory.

Slovak Agency for Waste Management (SAZP)

Topics: Waste information system.
Remarks: The Slovak Waste Information System, in place since 1998, is a subsystem of the Slovak Environmental Information System. In the year 2000, the new Regional Waste Information System (RISO 2000) was established. It collects data about waste generation, recovery, collection, treatment and disposal. It contains detailed information on processing and disposal facilities and a database on transboundary movements.

Regional activities

Topics: Regions and districts are obliged to submit data about waste flows in the binding parts of their waste management programmes. This new regulation will lead to a significant expansion of monitoring waste generation, especially on biodegradable waste.

Waste classification

Topics: The national waste catalogue was used for surveys up to 2001. The reporting forms for 2002 were drawn up according to the European waste catalogue. The data will also be processed by new software.

Development

The new Regional Waste Information System (RISO 2000), the introduction of the European Waste List (for 2002) and the integration of the 2 different waste information chains will harmonise the information and increase the quality.

Slovenia

Waste management

Coverage of organised waste collection

The share of settlements covered by public waste removal services was 74%, whereas the share of the population served was 84%.

Landfilling

There are 53 landfills in operation in Slovenia where mostly municipal waste is disposed of (inventorisation of landfills in the Republic of Slovenia, 1995), and 13 landfills for waste deriving from industry and mining (Strategic guidelines of the Republic of Slovenia for waste management, Poroevalec, No 36/96). The most established way of handling industrial waste and waste generated in the energy sector is deposition on mono-landfills and storing in the premises of companies. Nevertheless, well-established methods of recycling and fixation of hazardous substances are used in handling certain types of hazardous waste.

Other treatment methods

No other treatment mentioned.

Separate waste fraction collection

The collection of certain secondary raw materials has a relatively long tradition and has been quite successful. However, with the loss of former Yugoslav markets, the trade in secondary raw materials decreased (the 1994/89 index is 65). 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. The separate collection of certain types of urban waste at the source is still in the initial phase, recycling of collected waste is minimal, and there are no facilities for the use of the energy potential of municipal waste. The collection and sorting of hazardous components mixed with urban waste (car and other batteries, waste pesticides, waste paints and organic solvents, discarded medicines, etc.) has just begun. The system for

managing collected materials until they are destroyed or recycled has not yet been set up.

Waste management planning

Waste management plans

In 1996, the government prepared and adopted a document on waste management strategy. One of the main characteristics of the strategy is that strategic principles of the European Union regarding waste management (EU environment and sustainable development policy and action programme OJ C 138, 17.5.1993, p. 1) have been adopted in Slovenia.

Landfilling

The majority of municipal landfills will have to close their operations by the year 2000 since their capacities will be full. Only 12 municipal landfills have capacities sufficient for 10 or more years. Four municipal landfills can extend the period of their operation by 10 to 20 years if they expand on neighbouring land, while in some cases operation can be extended by as much as 50 years.

Information and education

Plans for setting-up an information system concerning wastes and facilities and plants for the treatment and final disposal of wastes. In addition to economic instruments, the waste management will focus on establishing links between waste generators/holders and persons disposing of waste. Because of the sensitivity of the problem and the pronounced NIMBY effect, special attention will have to be devoted to continuous informing, education and development with the view of gradually heightening the awareness of the entire population.

Waste statistics sources and expected development

Statistical Office Slovenia

Topics: Two two-yearly surveys on waste.
Remarks: A survey on public waste removal and public landfill sites (KOOP-1) and a survey on waste from economic activities (ODP-1).

Environment Administration for the Protection of Nature

Topics: Nearly permanent data collection activity on registering of enterprises and waste record collection.
Remarks: Collection of waste management record sheets and, in addition, annual reports on generation, collection, processing and disposal of waste.

Development

Statistics Slovenia made until 2001 three-yearly surveys on municipal waste and on waste from economic activities. Now the periodicity has changed (two-yearly) and also the questionnaires were improved. The 2001 data according to the old questionnaires will be available end 2002 and new data for 2002 at the end of 2003
In addition to the data collection from the side of the Statistical Office also the Environment Agency is collecting waste records from enterprises. A comparison or integration of the different data sources is not foreseen.

The new statistical surveys will increase data availability considerably.

Cyprus

Waste management

Coverage of organised waste collection

Complete.

Landfilling

Most municipal waste is disposed of via landfill. There are five landfill sites operating at present. In the rural areas, waste is often disposed of locally. The landfills are owned, managed and maintained by the municipalities. However they serve more than the local area, with 75 % of the population of the government-controlled area being served by the five landfills. The landfills have no system for control or registration, and no registration of the waste hauliers and other producers of waste. This means that there is no data on waste quantities and composition. Since 1993, a number of industries have installed their own treatment plants. In addition, a communal plant has been put into operation in the Limassol district, and more recently, a new plant started operating outside Nicosia, treating industrial waste originating from the Nicosia and Larnaca industries. Much of the waste treated in these two plants falls within the hazardous waste total identified by the 1993 study.
Other treatment methods
No other treatment facilities exist.

Separate waste fraction collection

Municipal waste is generally not segregated prior to collection, and recycling activities are few. There is some recycling of aluminium cans (about 1500 tonnes per annum), paper and cardboard (about 4000 tonnes per annum), all of which is baled and exported, except for paper/cardboard waste products from printing works which are recycled domestically. Glass beverage bottles of local origin are recycled through a deposit system, other glass containers are not recycled. At present, there are no manufacturers which operate using only recycled materials.

Waste management planning

Waste management plans

Cyprus has no national waste management strategy, although a contract with foreign consultants to produce such a strategy is understood to be imminent. Further, there is no detailed plan for the management of hazardous wastes, although specific studies have been carried out.

Landfilling

In addition, the proper organisation and sound management of municipal waste is not yet clearly defined, and the requirements for the upgrading of existing landfills have not yet been assessed. This can be expected to require significant investment in new landfills and in upgrading existing sites, together with investment in appropriate pre-treatment and composting plants in order to secure full compliance with the landfill directive.

Waste statistics sources and expected development

Statistical Office has made a first survey on municipalities for the year 2001 to determine the amount of municipal waste generated and collected. An estimation for the years before is done on the basis of the population and the number of per day tourists counted. Progress and development also with regard to specification of waste types depends on the further improvement of waste treatment and disposal equipment.

Malta

Waste management

Coverage of organised waste collection

Complete.

Landfilling

Currently most of the waste is disposed of untreated at the two landfill sites at Maghtab and Qortin.

Other treatment methods

Incinerators are exclusively used for hospital waste, slaughterhouse waste and dry dock waste. Another incinerator works at the airport. Sea dumping is still an important method of waste disposal: 3500 tonnes of sewage sludge and dry dock blasting grit are discharged into the Mediterranean Sea each year. An important problem is the lack of recycling and disposal plants for hazardous waste.

Separate waste fraction collection

At Sant Antnin, a compost plant treats 32000 tonnes of solid municipal waste annually. There is only one operating recycling facility at Maghtab, recovering metals, paper, clean source-separated plastics, and textiles on a small scale. The facility is still under development and not yet fully operational. Separate collection of household waste only takes place in the test region of Pembroke, where a bring system for glass, paper, cardboard, metal tins and plastic bottles has been introduced.

Waste management planning

Waste management plans

The Solid Waste Management Strategy for the Maltese Islands was approved by the Government of Malta in October 2001. One of its key principles is producer responsibility. In particular, producers should arrange and pay the management of used packaging material, batteries and accumulators, mineral oils, consumer durable and electronic goods, excavation, construction and demolition waste, tyres, and old vehicles. The Maltese Government prefers voluntary agreements with manufacturers; but if necessary, producer responsibility will be enforced by legal acts.

Landfilling

The existing landfills at Maghtab and Qortin are to be closed and restored. A new landfill facility will be developed for the disposal of pre-treated non-inert, non-hazardous wastes. Likewise, the government intends to install a new secure landfill facility for certain hazardous wastes, e. g. fly ash from power plants. In both Malta and Gozo, inert waste landfills will be established. Non-inert waste from Gozo will have to be transported to Malta for treatment and disposal.
Other treatment methods
At St Luke's Hospital, a waste decontamination and processing plant will replace the outdated incinerator. A similar treatment facility will be installed at the new hospital of Tal-Qroqq. As none of the existing waste incinerators could be economically upgraded, all of them will be closed down as soon as alternative facilities are available. The only possible exception is the abattoir waste incinerator on Gozo. The Sant Antnin Composting Plant and the slaughterhouse waste treatment facility at Marsa will be upgraded. At Sant Antnin, additional processing facilities for dry recyclable materials and sewage sludge will be created.

Separate waste fraction collection

The government counts on economic tools in order to recycle or dispose of waste separately. For the end of 2002, it plans the introduction of deposit refund systems for selected hazardous and/or recyclable products. Financial incentives for locally manufactured recycled products shall help introduce them on the Maltese market. As to the reduction of household waste, the government plans to encourage and promote home composting. Furthermore, it will install 'bring centres' in car parks, recreation areas and near supermarkets for the delivery of the recyclable components of domestic waste. These centres have already been introduced on a trial basis with encouraging results. Priority will also be given to waste management issues in educational curricula and programmes. Malta intends to retain its Non-Alcoholic Beverage Regulations and, if possible, extend their scope to other types of containers.

Waste statistics sources and expected development

Ministry for the Environment

Remarks: In Malta, there are no regular surveys upon waste. Current statistics are based upon the data provided by the landfill weighbridges at Maghtab and Qortin. The landfill employees require information from the waste transporters, but are frequently not answered because a legal basis is missing. So it is very difficult to classify the waste by sources. Another obstacle is the lack of a standard waste catalogue.

Central Statistical Office

Topics: Household survey on the composition of waste.
Remarks: As to household waste, samples have regularly been taken from waste transport vehicles since 1996. Between April 2002 and until March 2003, the National Statistics Office is carrying out a household waste composition survey.

Waste classification

Topics: The Waste Management Department is at present upgrading and harmonising its waste classification system in accordance with EWC. Several Phare projects have been

proposed in order to establish hazardous and municipal waste information systems according to EU standards.

Development

The further development depends on legal and technical points which cannot be influenced by statistics. Statistical Office is trying its utmost to specify the sources for municipal waste and also to detect the small enterprises generating hazardous wastes which are not yet handing over their wastes to official collectors and treaters.

Annex

The policy and legal framework of the European Union

Council Directive 75/442/EEC: waste framework directive

Amended by the following measures:

- Council Directive 91/156/EEC of 18 March 1991;
- Council Directive 91/692/EEC of 23 December 1991;
- Commission Decision 96/350/EC of 24 May 1996;
- Council Directive 96/59/EC of 16 September 1996.

The directive establishes a framework for the management of waste across the Community and a waste management hierarchy (prevention or reduction of waste production and its harmfulness; recovery of waste, including recycling, reuse or reclamation, or the use of waste as a source of energy). The basis for this directive is the Community's waste strategy.

Member States are required to establish an integrated and adequate network of disposal installations, taking account of the best available technology not involving excessive costs, in accordance with specific objectives such as the principle of proximity and self-sufficiency in waste disposal.

Member States shall draw up management plans governing, in particular, the types, quantities and origins of the wastes to be upgraded or disposed of, the general technical requirements, all of the special arrangements concerning specific wastes, and the appropriate locations and installations for the disposal.

Companies or establishments treating, storing or dumping waste for another party must obtain an authorisation from the competent authority which concerns, in particular, the types and quantities of waste to be treated, the general technical requirements and the precautions to be taken.

The 'polluter pays' principle is to apply to the disposal of waste, to ensure that the cost of disposing of waste is borne by the producer of the waste or by the holder of the waste who passes it on for collection or disposal.

Furthermore, data recording and reporting systems have to be established to monitor the measures taken to implement the directive, in particular the waste hierarchy and the national waste management plans, and to ensure that data are collected on the name, address, type and quantities of waste handled for each hazardous waste disposal establishment.

Council Directive 91/689/EEC: hazardous waste

Amended by

Commission Directive 94/31/EC of 27 July 1994.

The main aims of this directive are to introduce a precise and uniform definition of hazardous waste, and to promote the environmentally-sound management of hazardous waste, taking into account the special nature of such waste. Domestic waste is not covered by the directive. All waste (hazardous or not) is subject to Directive 75/442/EEC, hazardous waste is also subject to Directive 91/689/EEC. A number of controls, additional to those laid down in the Framework Waste Directive (75/442/EEC), are imposed in respect of the handling and disposal of hazardous waste.

Member States ensure that hazardous waste is recorded and identified; they also ensure that different categories of hazardous waste are not mixed and that hazardous waste is not mixed with non-hazardous waste, save where the necessary measures have been taken to safeguard human health and the environment.

Any establishment or undertaking which carries out disposal operations must obtain a permit. This applies also in the case of operations which may lead to recovery. However, the permit requirement may be waived in the latter case if the method of recovery is such that there is no danger to human health or the environment, or if the Member State has adopted general measures laying down conditions for various methods of recovery, provided the conditions have been communicated to the Commission.

Establishments or undertakings which carry out disposal operations or operations which may lead to recovery and producers of hazardous waste are subject to periodic inspections covering in particular the origin and destination of the waste. Transporters, producers, establishments and undertakings keep a record of their activities and make this information available to the competent authorities designated by each State.

Member States shall draw up and publish plans for the management of hazardous waste and report to the Commission on measures taken to implement the directive.

Council Directive 75/439/EEC: disposal of waste oils

Amended by:

- Council Directive 87/101/EEC of 22 December 1986;
- Council Directive 91/692/EEC of 23 December 1991.

The purpose of the directive is to create a harmonised system for the collection, treatment, storage and disposal of waste oils, without harming the environment. Member States are required to establish systems for the registration, permitting and supervision of activities involving the processing or disposal of waste oils. The highest priority for managing waste oils is given to regeneration, followed by combustion, then destruction or controlled storage or disposal. Note that this directive has a different definition of 'disposal' from the definition in the Framework Directive on Waste. The waste oils directive defines 'disposal' more widely, whereas in the framework directive disposal is only final disposal. In the waste oils directive disposal is defined as comprising treatment (defined as recovery operations – regeneration and combustion), destruction, storage and disposal, i.e. also processes other than 'final' disposal. Other provisions are as follows.

- Ensure that waste oils are collected and disposed (within the wider meaning of the term disposal as defined in the directive) of without causing avoidable damage to human health and the environment.
- In managing waste oils, give priority to processing by regeneration, then to combustion, and finally to safe destruction, controlled storage or (final) disposal.
- Public awareness campaigns to information and to ensure that waste oils are stored appropriately and, as far as possible, collected.
- If necessary, require undertakings to collect/dispose (as defined in the directive, wider meaning) of waste oils, by imposing a public service obligation.
- Prohibit the discharge of waste oils into waters or onto soils and emissions to air in excess of permitted levels.
- Require any undertaking that collects waste oils to be subject to registration and supervision and that disposes of waste oils to be subject to prior authorisation.
- Take measures to ensure that the operation of plants where waste oils are used as fuel will not cause significant levels of air pollution, and that waste oils used as fuel do not constitute toxic and dangerous waste or contain PCB/PCT concentrations of more than 50 ppm.
- Prohibit mixing of waste oils with PCBs/PCTs or with toxic and dangerous waste, when collecting or storing waste oils.

Member States have to report to the Commission on measures taken to comply with the directive including measures regarding regeneration and combustion, and on technical expertise and experience gained and results of applying measures required under the directive.

Council Directive 86/278/EEC: usage of sewage sludge in agriculture

The main aims are to regulate the use of sewage sludge in agriculture in order to prevent harmful effects on soil, vegetation, animals and humans. The directive requires the application of maximum limit values for certain heavy metals in the soil, in sludge and for the maximum annual quantities of heavy metals which may be introduced into the soil. It requires Member States, inter alia, to:

- ensure that the use of sludge in agriculture complies with limit values for the concentrations of heavy metals in soil;
- prohibit the use of sewage sludge on specified categories of land within defined periods or where the concentrations of heavy metals in the soil exceeds specific limit values;
- ensure that the necessary information is available to the competent authorities;
- analyse sewage sludge and soil to ensure that the proper limits are adhered to.

Sludge and soil on which it is used must be sampled and analysed and records must be kept registering the quantities of sludge produced and the quantities supplied for use in agriculture, the composition and properties of the sludge, the type of treatment carried out; and the names and addresses of the recipients of the sludge and the places where the sludge is to be used.

Member States have to report to the Commission on the measures taken to comply with the directive, including circumstances where more stringent measures than required under the directive are adopted and on the use of sewage sludge in agriculture.

Council Directive 91/157/EEC: batteries and accumulators containing dangerous substances

Amended by:

- Commission Directive 93/86/EEC of 4 October 1993;
- Commission Directive 98/101/EC of 22 December 1998.

This directive aims to approximate laws on the recovery and controlled disposal of spent batteries and accumulators containing dangerous substances. It requires Member States to draw up programmes to achieve appropriate waste management of spent batteries and accumulators, and the reduction of their heavy metal content. In addition, consumers must be informed about the dangers of uncontrolled disposal, the marking system and how to remove batteries from appliances.

Detailed requirements for marking batteries and accumulators are laid down in Commission Directive 93/86/EEC. Commission Directive 98/101/EC widens the scope of Directive 91/157/EEC and strengthens the ban for mercury containing batteries.

It requires Member States, inter alia, to:

- ensure the efficient organisation of separate collection systems with a view to recovery or disposal, and where appropriate consider the use of deposit systems;
- prohibit the marketing of alkaline manganese batteries containing specified levels of mercury;
- consult with concerned parties on proposals for a separate collection and deposit system as well as for economic instruments in order to promote recycling;
- provide consumers with specific information about batteries and accumulators, including information about the dangers of their uncontrolled disposal.

Member States have to report to the Commission on measures taken to comply with the directives, including the programmes for achieving specified objectives, the measures to establish a separate collection and deposit system as well as economic instruments in order to encourage recycling.

Council Directive 94/62/EEC: packaging and packaging waste

The main aim is to harmonise national measures concerning the management of packaging and packaging waste, to provide a high level of environmental protection, to ensure the functioning of the internal market as well as to avoid obstacles to trade, and distortion and restriction of competition within the Community. This directive covers all packaging placed on the market in the Community and all packaging waste, whether it is used or released at the industrial, commercial, office, shop, service, household or any other level, regardless of the material used.

In Article 3 the definitions for the purposes of this directive are given, among others prevention and reuse are defined and recovery processes are further specified by definition of energy recovery and recycling as well as organic recycling.

The directive lays down minimum standards for packaging materials and targets for the recovery and recycling of packaging waste and requires Member States, inter alia, to:

- include a chapter on the management of packaging and packaging waste in waste management plans required by the waste framework directive;
- set up systems for the return and collection of used packaging and packaging waste and their reuse or recovery; and ensure that systems are open to economic operators of all relevant sectors and competent public authorities, and apply to imported products;
- establish databases on packaging and packaging waste in accordance with the formats laid down in Commission Decision 97/138/EC;
- take measures to prevent the production of packaging waste and to attain specified targets for recovering and recycling packaging waste, including measures to ensure that 50–65% of packaging waste is recovered and 25–45% of packaging material contained in packaging waste is recycled;
- encourage the use of materials obtained from recycled packaging waste;
- take measures to ensure that users of packaging, particularly consumers, obtain information on how they could contribute to re-use, recovery and recycling of this waste.

Commission Decision 97/138/EC of 3 February 1997 establishes the formats relating to the database system pursuant to European Parliament and Council Directive 94/62/EC on packaging and packaging waste. The formats serve to harmonise the characteristics and presentation of data on packaging and packaging waste, making them compatible from one Member State to another. The data will be used to monitor attainment of the objectives of Directive 94/62/EC. Provision of data is compulsory in respect of the following data:

- quantities of packaging put on the national market;
- quantities of packaging waste arising;
- recycled quantities of packaging waste;
- recovered quantities of packaging waste.

These data are obligatory for the packaging materials paper/cardboard, glass, plastics and metals. Data on composites may be either included according to the predominant material or specified separately.

Council Directive 96/59/EEC: disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBS/PCTS)

The purpose of the directive is to harmonise laws on the controlled disposal of PCB/PCTs and on the decontamination or disposal of equipment containing PCBs (PCBs, PCTs and similar substances) with a view to eliminating them completely. Deadlines for the elimination of PCBs will need to be established in accordance with the requirements of the directive. The latest deadline in the directive is the end of 2010.

The equipment containing PCBs must be inventoried, labelled and reported to the Commission, and the disposal of PCBs must be licensed and carried out in accordance with specific conditions. Member States must draw up plans for the decontamination and/or disposal of inventoried equipment and the PCBs contained therein and plans for the collection and subsequent disposal of equipment not subject to inventory.

The inventories must supply the following data:

- the names and addresses of the holders;
- the location and description of the equipment;
- the quantity of PCBs contained in the equipment;
- the date and type of treatment planned;
- the date of the declaration.

Member States must prohibit the separation of PCBs from other substances for the purpose of reusing the PCBs, the filling of transformers with PCBs, the maintenance of transformers containing PCBs except subject to specified conditions and the incineration of PCBs on ships.

PCBs, used PCBs and equipment containing PCBs which is subject to inventory must be transferred to licensed undertakings, at the same time ensuring that all necessary precautions are taken to avoid the risk of fire. All undertakings engaged in the decontamination and/or the disposal of PCBs, used PCBs and/or equipment containing PCBs must obtain permits.

Reporting systems have to be established to ensure that data are collected and reported on inventories and on plans for the decontamination and/or disposal.

Council Directive 99/31/EEC: landfill of waste

The main aim of this directive is to provide for measures, procedures and guidance to prevent or reduce the negative effects on the environment, and the risks to human health, from landfilling of waste.

It requires Member States to take a number of measures to achieve this aim, including treating waste before landfilling it, phasing out co-disposal (the mixing of hazardous waste with non-hazardous waste) and supervising site closure and aftercare.

The directive defines the different categories of waste (municipal waste, hazardous waste, non-hazardous waste and inert waste) and applies to all landfills, defined as waste disposal sites for the deposit of waste onto or into land. Landfills are divided into three classes:

- Landfills for hazardous waste;
- Landfills for non-hazardous waste;
- Landfills for inert waste.

Member States are required to prepare and implement a national strategy for reducing the amount of biodegradable municipal waste going to landfill in order to meet specified

targets and to establish appropriate monitoring systems. Further provisions of the directive are to:

- ensure that landfill sites are located, constructed and operated in accordance with specified standards;
- prohibit landfilling of tyres, liquid waste, infectious clinical waste and certain types of hazardous waste;
- apply stringent provisions on the supervision, monitoring, reporting and closure of landfill sites;
- require operators to prepare conditioning plans for landfill sites and decide whether existing sites may continue to operate;
- require holders of landfill permits to report at least annually on types and quantities of waste disposed of and results of monitoring programmes;
- require a register to be kept on the quantities and characteristics of waste deposited at landfill sites including exempted sites;
- ensure that after closure of a landfill site (in accordance with the specified procedures) the operator remains responsible for the maintenance, monitoring and supervision of the site for as long as is required by the competent authority.

Member States must make information available to national and Community statistical authorities, when requested, including data on amounts and types of waste going to landfill sites, and details of information provided in permit applications. They have to report to the Commission every three years on the implementation of the directive.

Council Directive 2000/53/EEC: end-of-life vehicles

The purpose of this directive is to harmonise laws on the recovery and controlled disposal of end-of life vehicles and their components. Waste prevention is the priority objective of the directive. To this end, it stipulates that vehicle manufacturers and material and equipment manufacturers must:

- endeavour to reduce the use of hazardous substances when designing vehicles;
- design and produce vehicles which facilitate the dismantling, reuse, recovery and recycling of end-of-life vehicles;
- increase the use of recycled materials in vehicle manufacture;
- ensure that components of vehicles placed on the market after 1 July 2003 do not contain mercury, hexavalent chromium, cadmium or lead, except in the cases listed in Annex II. The Commission must amend the annex in the light of scientific and technical progress.

The directive also introduces provisions on the collection of all end-of-life vehicles. Member States must set up collection systems for end-of-life vehicles and for waste of used parts. They must also ensure that all vehicles are transferred to authorised treatment facilities, and must set up a system of deregistration upon presentation of a certificate of destruction. Such certificates are to be issued when the vehicle is transferred, free of charge, to a treatment facility.

The last holder of an end-of-life vehicle will be able to dispose of it free of charge ('free take-back' principle). Producers must meet all, or a significant part of, the cost of applying this measure.

The storage and treatment of end-of-life vehicles is also subject to strict control, in accordance with the requirements of Directive 75/442/EEC and those of Annex I to the directive. Establishments or undertakings carrying out treatment operations must strip end-of-life vehicles before treatment and recover all environmentally hazardous components. Priority must be given to the reuse and recycling of vehicle components (batteries, tyres, oil).

At the moment, 75% of end-of-life vehicles are recycled (metal content). The aim of this directive is to increase the rate of reuse and recovery to 85% by average weight per vehicle and year by 2006, and to 95% by 2015, and to increase the rate of re-use and recycling over the same period to at least 80% and 85% respectively by average weight per vehicle and year. Less stringent objectives may be set for vehicles produced before 1980.

Member States must ensure that producers use material coding standards which allow identification of the various materials during dismantling. The Commission must establish European standards on material coding and identification.

Member States may transpose certain of the directive's provisions by means of agreements with the economic sectors concerned.

Economic operators must provide prospective purchasers of vehicles with information on the recovery and recycling of vehicle components, the treatment of end-of-life vehicles and progress with regard to reuse, recycling and recovery. On the basis of this information, Member States must report to the Commission every three years on the implementation of the directive.

Decision 2002/151/EC on minimum requirements for the certificate of destruction issued in accordance with Article 5(3) of Directive 2000/53/EC of the European Parliament and of the Council on end-of-life vehicles aims at providing certainty about the identity and details of the treatment facility, competent authority and vehicle holder, as well as a number of items of information relating to the vehicle.

Emerging legislation

On 7 December 2001, the Commission presented a proposal for a directive of the European Parliament and of the Council, amending Directive 94/62/EC on packaging and packaging waste COM (2001) 729 final.

This proposal lays down new, more ambitious targets for recovery and recycling, to be met by 30 June 2006. The overall recovery and recycling targets must be between 60% and 75%, and 55% and 70% respectively. Specific recycling targets were also fixed according to materials: 60% for glass, 55% for paper and cardboard, 50% for metals and 20% for plastics (mechanical and chemical recycling only). Greece, Ireland and Portugal were given until 30 June 2009 to meet these targets.

The proposal signals the need for new definitions of 'raw material' and chemical recycling. It includes an interpretation of the definition of packaging.

There are also a number of other proposed EU directives relating specifically to wastes, including:

- a proposed directive on hazardous municipal waste collection – this envisages the separate collection of a range of hazardous materials/used products typically arising in municipal waste;
- a proposed revision of the existing packaging and packaging waste directive – this proposes, inter alia, new (and higher) targets for the recycling of packaging wastes;
- a proposed directive on battery recycling – this would require the collection and recycling of all types of batteries across Europe;
- a draft directive on recycling and recovery of electronic waste – this envisages the introduction of a range of measures to reduce, recover, reuse and recycle waste electrical and electronic equipment;
- a proposed directive on the biological treatment of 'biowaste' – this envisages a range of measures to promote and manage the recovery and recycling of biodegradable wastes, including home composting and the separate collection of the biodegradable fractions of municipal, commercial and industrial wastes.

Reporting formats

All of the EU directives dealing with waste, with the exception of Directive 91/157/EEC (batteries and accumulators) fall under the remit of Directive 91/692/EEC on the rationalisation and standardisation of reporting (Council Directive 91/692/EEC on standardising and rationalising reports on the implementation of certain directives relating to the environment). This directive asks Member States to report every three years in the form of a sectorial report on related items of legislation. Reports are 'standardised' in the sense that Member States all respond to the same questionnaires drawn up by the Commission for each item of legislation.

The reports have to be drawn up on the basis of questionnaires or outlines produced by the Commission, with the assistance of a committee, and sent to the Member States. The Commission has adopted several decisions on questionnaires for reports in the waste sector. For the directive on the disposal of PCBs no questionnaires have yet been published.

Decisions containing questionnaires for waste legislation reporting under the reporting directive:

- Decision 94/741/ECDirective 75/422/EEC on waste;
- Directive 75/439/EEC on the disposal of waste oils;
- Directive 86/278/EEC on sewage sludge;
- Decision 97/622/ECDirective 91/689/EEC on hazardous waste;
- Directive 94/62/EEC on packaging and packaging waste;
- Decision 2000/738/ECDirective 1999/31/EC on landfill of waste;
- Decision 2001/753/ECDirective 2000/53/EC on end-of-life vehicles.

Data requirement set out in above listed Decisions:

Council Directive 75/422/EEC on waste

The annual production and treatment of domestic waste, hazardous waste and other waste (to be specified) within the Member State:

Total waste produced, of which:

- recycled;
- incinerated;
- incinerated, with energy;
- recovered;
- landfilled;
- others, please specify.

Council Directive 75/439/EEC on the disposal of waste oil

The annual total quantity of oil marketed/sold (where available) and the total waste oils generated, of which:

- quantity collected;
- quantity regenerated;
- quantity combusted;
- quantity tipped (including permanent storage).

Council Directive 86/278/EEC on the use of sewage sludge in agriculture

The following quantities have to be given as annual data in dry matter.

- Sewage sludge produced by wastewater treatment plants;
- Sewage sludge used in agriculture.

Council Directive 91/689/EEC on hazardous waste

The hazardous waste generation and treated within Member State and hazardous waste generated outside Member State and imported for treatment in tonnes per year. In addition, information on treatment facilities have to be reported.

Total hazardous waste generated, of which:

- recycled;
- incinerated;
- incinerated (with energy recovery);
- landfilled;
- others (for specification).

Hazardous waste treatment facilities

- treatment facilities according to Annexes IIA and IIB;
- name and address;
- designed capacity;
- waste types treated in EWC-codes.

Council Directive 1999/31/EC on the landfill of waste

- the annual amount of biodegradable municipal waste generated by waste types in tonnes;

- the annual amount of biodegradable waste generated by waste types in tonnes going to landfills.

The data requirement on the implementation of Council Directive 94/62/EC on packaging and packaging waste are set out in Commission Decision 97/138/EC concerning the formats relating to the database system pursuant to Council Directive 94/62/EC on packaging and packaging waste. The annexes of this decisions contain the following tables:

- Table 1: Quantity of packaging placed on the market within the Member State;
- Table 2: Reusable packaging;
- Table 3: Quantities of packaging waste (in tonnes) arising and managed within the Member State;
- Table 4.1: Monitored quantities of packaging waste (in tonnes) arising within the Member State and recovered outside the Member State;
- Table 4.2: Monitored quantities of packaging waste (in tonnes) arising outside the Member State and recovered within the Member State;

Provision of data (in tonnes) is compulsory in respect of the following data:

- quantities of packaging put on the national market;
- packaging waste arising;
- quantities of packaging waste recycling;
- quantities of packaging waste recovery.

These data are obligatory for the packaging materials paper/cardboard, glass, plastics and metals. Data on composites may be either included according to the predominant material or specified separately.

Council Directive 2000/53/EC on end-of-life vehicles

Information on types and quantities of recycled materials in vehicles and in other products as well as on the market situation for recycled materials:

- number of vehicles collected and transferred to authorised treatment facilities in each calendar year of the reference period;
- number of treatment facilities authorised or registered in accordance with Article 6;
- number of end-of-life vehicles delivered at authorised treatment facilities and having no or a negative market value;
- number of treatment establishments or undertakings which have introduced certified environmental management systems;
- information on the rates of reuse, recycling and recovery attained in each calendar year of the reference period;
- information concerning dismantling, storage and testing made available by producers and manufacturers of components;
- information, on, if any, possible changes in the structure of motor vehicle dealing and of the collection, dismantling, shredding, recovery and recycling industries. Please indicate in particular if any competition distortion between or within Member States has been identified.