Waste statistics surveys

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Abstract

In the European Union the modern environmental protection policy and related legislation focus on preventing negative impacts on the environment that are the result of activities conducted by people. These nevertheless strive to do this also by abandoning the use of harmful substances, activities and procedures, the effects of which can cause permanent damage to the environment.

The fundamental principle of environmental protection is thus prevention.

For enforcing this principle, basic information must be provided on the basis of which certain measures can be adopted. The data on the amount of waste generated and on waste management are also very important for proper policy-making. For the data to be relevant and correct, it is, of course, necessary to implement accurate data collection, processing and analysis, which is provided by statistical surveys in these fields. However, these surveys need to be harmonised with the legislation governing the field of waste in individual countries as well as in the European Union.

The paper attempts to show individual waste streams, statistical collection of these data, their processing and requirements that we have to take into consideration in our work (Waste Statistic Regulation).
Keywords: waste, statistical survey, handling of waste, list of waste, waste statistics regulation, NACE classification.

1 Introduction

Waste is any material or object, which the owner or possessor cannot or does not want to use, does not need, is disturbing or damaging to him and he discharges it, intends or has to discharge it.

Waste is also any material or object which is to be collected, processed, disposed or transported as prescribed due to environmental protection or other public benefit [2].

Despite intensive efforts to reduce the amount of waste, it keeps increasing every year, and is consequently harming the environment. Harmful impacts on the environment, which are related to waste, are mainly the pollution of subterranean and surface waters, the pollution of soil, our health is endangered by poisonous gas emissions, dust particles, scents and the greenhouse effects which all result from methane emissions from waste landfill sites.

Accurate records on the existing waste amounts and waste management are of vital importance for the prevention of dangerous waste-related influences, proper environmental policy, and for proper decisions in this area. Data on the existing waste amounts and waste management are obtained with the help of waste statistics surveys.

Bringing the waste data collection in line with the standards, laid down by the European Union, is one of important steps to be taken by every EU Member State. The statistics on waste data collection in an individual country is of key importance for satisfactory control in the area of waste politics and its future course.

2 Lifecycle of industrial and municipal waste

2.1 Industrial waste

From its origin to its final recovering or disposal procedure waste goes through a number of different stages or travels a number of different paths.

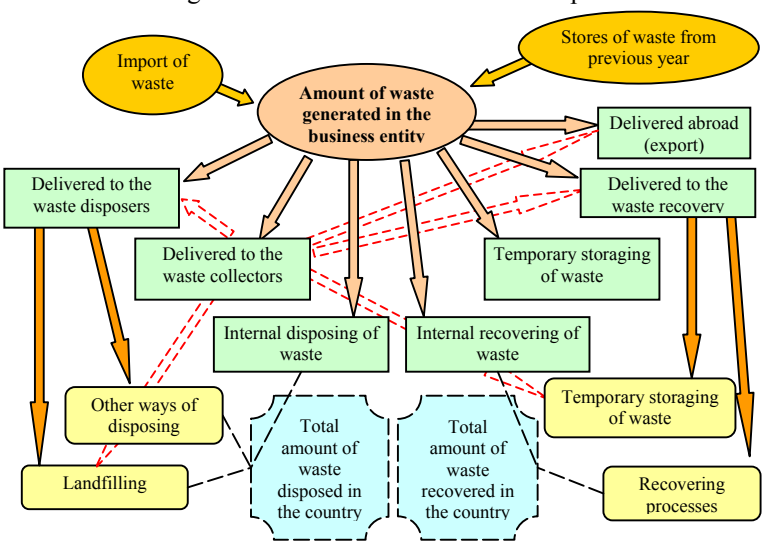

Figure 1: Cycle of industrial waste.

Industrial waste is the result of production and service activities in individual business entities. Business entities can then decide whether to reuse that waste in the production process or to dispose it on their own. That is the case of internal waste management, which includes the internal waste recovering and/or disposing process. However, business entities can leave that waste to other business entities for future waste recovery or disposal. In that case waste goes from waste collectors to waste recyclers or disposers, or directly to waste recyclers or disposers who finally recycle or dispose waste.

2.2 Municipal and similar waste

The cycle of municipal waste is slightly different. Municipal waste is mostly produced in households, which landfill it into waste containers for mixed municipal waste, separately into waste containers designated for separate collected fractions (e.g. paper, glass, packaging), or deliver it to the waste collection centres. The collection of municipal waste is then conducted by public waste services, which transport the mixed municipal waste to public waste landfill sites, and separately collect waste to processors or waste removers.

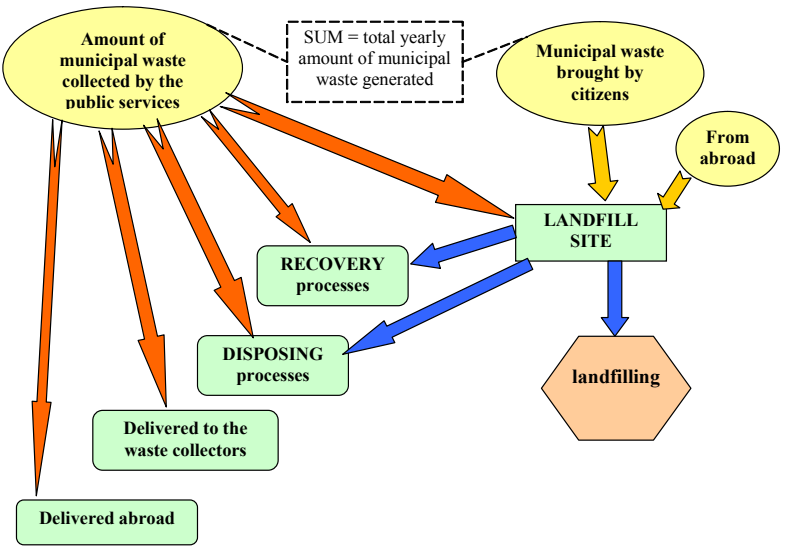

Figure 2: Cycle of municipal waste.

3 Requirements and needs for a statistical data entry

Regarding the waste cycles, the collection of data on waste can be conducted in a number of ways. Statistical data collection for industrial waste is conducted via three different sources.

The first source of the statistical data in the EU is the business entity, where waste is generated. Here the following can be controlled: the amount of waste generated, the types of waste, the amount of internally recovered or disposed waste, the amount of temporarily stored waste and the amount of waste, handed over to another business entity with the intention of recovering and/or disposing this waste. The act [2] regulates that waste is to be temporarily stored up to a year after it has been produced, before the final recovery or disposal procedure. The business entity also communicates the accurate data on the amount of waste, transported abroad or exported.

This method of data collection is very accurate, as the data are received from the source; however, it demands a lot of effort and is expensive due to a large number of business entities. It is difficult to include all business entities, coming from a certain country and being potential waste producers, into the survey. It is therefore wiser to implement sample survey, and later recalculate the results to the total population.

The second source of statistical data are waste collectors. Waste collectors are those business entities that have a waste collecting licence, issued by the competent ministries. Waste producers hand waste over to waste collectors who then transport it to recyclers or disposers. Data received from waste collectors are seen as a control bridge between waste producers and waste recyclers and/or disposers. Very important data, received from data collectors, is the amount of waste, imported into a country with the intention of managing that waste in that country, and the amount of waste, received from business entities with the intention of exporting it out of the country.

The third source of statistical data on waste is waste recyclers and/or disposers, who have to obtain a waste collecting licence, issued by the competent ministries. Only those types of waste are to be recycled or disposed, and only according to those procedures, for which a licence has been issued. Waste recyclers and/or disposers communicate the data on the amount of waste and on recycling and/or disposing methods of the individual types of waste.

To ensure comparable results, waste statistics is to be prepared according to the set classification system, in an appropriate form, and within specified time limits after the reference year has ended. These conditions are laid down in the Waste Statistics Regulation [1], according to which the MS statistical offices are required to communicate data to the Statistical Office of the European Communities - Eurostat.

3.1 Waste Statistics Regulation [1]

The Waste Statistic Regulation (WSR) was adopted in November 2002. All EU Member States will have to meet the Regulation requirements and from June 2006 onwards communicate the required data for the year 2004.

In line with the Directive, waste statistics will cover the areas of waste development, recovery and disposal, waste export and import. When preparing the statistics, the countries must apply the statistics waste nomenclature (EWC-Stat).

The collection of data, which must meet the quality and accuracy conditions, can in some countries be conducted with the help of statistical surveys, administrative and other sources, statistical evaluations on the basis of samples or assessments of assessors in the area of waste, or with the combination of the above-mentioned possibilities.

In order to reduce the administrative burden on small business entities, the statistical survey do not include business entities with less than 10 employees, except for those, which significantly contribute to waste production with their activity. WSR also defines that waste statistics must encompass all areas of activity from A to Q according to the NACE Rev 1 Classification, which means that all service activities are included as well, as shown in Table 1. The data communicated must also include waste produced in households and waste resulting from recovery and/or waste disposal procedures. Data on waste must be deployed according to the EWC-Stat list. The unit for all types of waste is 1000 tonnes, whereas the quantity of dry material is additionally indicated for the waste group `sludge'.

Table 1: Activities according to NACE classification.

1	A	Agriculture, hunting and forestry
2	B	Fishing
3	C	Mining and quarrying
4	DA	Manufacture of food products, beverages and tobacco
5	DB+DC	Manufacture of textiles and textile products + Manufacture of leather and leather products
6	DD	Manufacture of wood and wood products
7	DE	Manufacture of pulp, paper and paper products; publishing and printing
8	DF	Manufacture of coke, refined petroleum products and nuclear fuel
9	DG+DH	Manufacture of chemicals, chemical products, man-made fibres + manufacture of rubber and plastic products
10	DI	Manufacture of other non-metallic mineral products
11	DJ	Manufacture of basic metals and fabricated metal products
12	DK+DL+DM	Manufacture of machinery and equipment + Manufacture of electrical and optical equipment + Manufacture of transport equipment
13	DN without 37	Manufacturing n.e.c.
14	E	Electricity, gas, steam and hot water supply
15	F	Construction
16	G-Q except 90 and 51.57	Services activities: Wholesale and retail trade; Repair of motor vehicles, motor cycles and personal and household goods + Hotels and Restaurants + Transports, storage and communications + Financial intermediation + Real estate, renting and business activities + Public administration, defence and compulsory social security + Education + Health and Social Work + Other community, social and personal activities
17	37	Recycling
18	51.57	Wholesale of waste and scrap
19	90	Sewage and refuse disposal, sanitation and similar activities
20		Waste generated by households

Statistics must be prepared for all recovery and disposal facilities. The waste statistics excludes the facilities if their activity in waste management is limited to recycling of waste on the site, where the waste was generated.

Statistics on recovering and disposal procedures has to be prepared for a number of working facilities and to focus on their performance and total quantity of waste, processed according to the procedures of incineration, operations which may lead to recovery and disposal (other than incineration).

In recovering and disposal it has to be marked, according to which procedure of recovery (R) or disposal (D) the waste was managed. The recovering procedures are divided into 13 different groups (from R1 to R13) and the disposal procedures into 15 groups (from D1 to D15).

3.2 The waste statistics questionnaire

In case of statistical data collection through a statistical survey adequate questionnaires and methodological materials must be prepared. The questionnaire structure and appearance are not set out by the Regulation, thus each country makes its own questionnaire for data collection.

These questionnaires, completed by the reporting units, help obtain the relevant data. These questionnaires may contain individual questions on reporting units, their activity and the types of waste they generate. At the same time they also contain tables that include numerical data on quantities and types of generated waste and waste management.

Questionnaires on waste are very extensive and it is difficult to complete them in most EU Member States, therefore methodology materials containing precise instructions for their completion are enclosed.

3.3 Valid lists of waste

Individual countries can conduct a statistical survey on waste with the help of different lists of waste. Lists to be used in line with the current legislation in force in the EU are EWC-Stat[1] and List of Waste (LoW) [2]. Nevertheless, individual countries can establish their national classification lists of waste, according to which data are collected. However, these lists must be harmonised and translatable into required formats. The required data on waste, classified according to EWC-Stat will have to be transmitted to Eurostat by the Statistical Offices. Therefore a conversion table from LoW can already be found in the Regulation [1].

3.3.1 EWC-Stat

The above-mentioned WSR lays down the EWC-Stat Classification List, which is prepared in relation to the material basis of waste and encompasses 30 types of different waste. Waste is further classified into hazardous and non-hazardous waste. Data on the quantity resulting is needed for each group of waste.

Table 2: EWC-Stat list.

	Code	Description	Type	
1	01.1	Spent solvents	-	Hazardous
2	01.2	Acid, alkaline or saline wastes	Non-hazardous	Hazardous
3	01.3	Used oils Spent chemical catalysts	-	Hazardous
4	02	Chemical preparation wastes	Non-hazardous	Hazardous
5	03.1	Chemical deposits and residues	Non-hazardous	Hazardous
6	03.2	Industrial effluent sludges	Non-hazardous	Hazardous
7	05	Health care and biological wastes	Non-hazardous	Hazardous
8	06	Metallic wastes	Non-hazardous	Hazardous
9	07.1	Glass wastes	Non-hazardous	Hazardous
10	07.2	Paper and cardboard wastes	Non-hazardous	-
11	07.3	Rubber wastes	Non-hazardous	-
12	07.4	Plastic wastes	Non-hazardous	-
13	07.5	Wood wastes	Non-hazardous	Hazardous
14	07.6	Textile wastes	Non-hazardous	
15	07.7	Waste containing PCB	-	Hazardous
16	08	Discarded equipment	Non-hazardous	Hazardous
17	08.1	Discarded vehicles	Non-hazardous	Hazardous
18	08.41	Batteries and accumulators wastes	Non-hazardous	Hazardous
19	09	Animal and vegetal wastes	Non-hazardous	-
20	09.11	Animal waste of food preparation and products	Non-hazardous	-
21	09.3	Animal faeces, urine and manure	Non-hazardous	-
22	10.1	Household and similar wastes	Non-hazardous	-
23	10.2	Mixed and undifferentiated materials	Non-hazardous	Hazardous
24	10.3	Sorting residues	Non-hazardous	Hazardous
25	11	Common sludges	Non-hazardous	-
26	11.3	Dredging spoils	Non-hazardous	-
27	12.1+ 12.2+ 12.3+ 12.5	Mineral wastes (excl combustion wastes, contaminated soils and polluted dredging spoils)	Non-hazardous	Hazardous
28	12.4	Combustion wastes	Non-hazardous	Hazardous
29	12.6	Contaminated soils and polluted dredging spoils	-	Hazardous
30	13	Solidified, stabilised or vitrified wastes	Non-hazardous	Hazardous

3.3.2 List of Waste (LoW)

The classification list of waste, which is in compliance with the Regulation of the European Commission [2] and is valid from the year 2001, classifies waste according to its origin and regardless of its material basis. It is divided into 20 thematic groups of waste, which are further divided into waste subgroups, and the subgroups are further broken down into individual types of waste. Each

waste, indicated in the Classification List, has a six-digit code. In addition to this code, the hazardous waste also carries the following mark: *.

Classification list of waste thus encompasses 839 types of waste, 405 types of which are hazardous waste.

Individual groups of waste are:

Group 01	Wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals
Group 02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing
Group 03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard
Group 04	Wastes from the leather, fur and textile industries
Group 05	Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal
Group 06	Wastes from inorganic chemical processes
Group 07	Wastes from organic chemical processes
Group 08	Wastes from the manufacture, formulation, supply and use (mfsu) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks
Group 09	Wastes from the photographic industry
Group 10	Wastes from thermal processes
Group 11	Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydro-metallurgy
Group 12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics
Group 13	Oil wastes and wastes of liquid fuels (except edible oils, and those in chapters 05, 12 and 19)
Group 14	Waste organic solvents, refrigerants and propellants (except 07 and 08)
Group 15	Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified
Group 16	Wastes not otherwise specified in the list
Group 17	Construction and demolition wastes (including excavated soil from contaminated sites)
Group 18	Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)
Group 19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
Group 20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions

4 Workflow of the statistical survey

The statistical survey is conducted according to the pre-defined procedures:

- preparation of methodology for the survey implementation;
- preparation of methodology materials in accordance with the set methodology;
- preparation of questionnaire for data collection;
- selection of target group (reporting units);
- preparation of directory of reporting units according to the requirements, set out in the Regulation [1];
- sending of the questionnaires and methodology materials to reporting units;
- collection of completed questionnaires;
- preparation of a programme for data entry and control;
- visual and computer control of acquired data;
- contacting reporting units and correcting mistakes;
- processing of final data;
- preparation of publication tables;
- analysis of results, acquired by the survey;
- publication of results in internal, national and international publications.

5 Conclusion

The basic principle of the environmental protection is preventing negative impacts of man on the environment. For the implementation of this principle, statistical information must be provided, on the basis of which final decisions are adopted at the local or on state level. Information on environmental problems of the economic development is necessary for the policy-making of balanced development. On the next level the information is transformed into environmental accounts. Environmental accounts are indicators that point out, how much different layers of the society contribute to national and international environmental aims.

Quality data acquired with the help of statistical surveys are needed to establish adequate and accurate indicators of environment. The cooperation between reporting units and data collection offices is of vital importance for the quality data collection and precise analyses. The bigger the cooperation, the more qualitative and accurate is the environmental indicators, which lead to better political solutions.

The state of the environment we live in greatly depends upon human beings, and with timely action and/or correct solutions only can we keep it clean and useful for generations to come.

References

[1] The Waste Statistic Regulation: Regulation (EC) No 2150/2002 of the European Parliament and of the Council of 25 November 2002 on waste statistics (Text with EEA relevance), Official Journal L 332, 09/12/2002 P. 0001 - 0036
[2] Rules on waste management, Official Journal of the Republic of Slovenia No. 20/01 and 13/03