

INSTITUTO NACIONAL DE ESTADISTICA



Survey on the collection and treatment of waste Year 2011

Methodology

Index

1- Introduction	2
2- Objectives	2
3- Scope of the survey	2
4- Framework and design of the survey	3
5- Variables and definitions	4
6- Collection of the information	11
7- Processing of the information	11
8- Estimators	12
9- Tables of results	12

1 Introduction

One of the most important objectives of the Spanish Sustainable Development Strategy (SSDS) passed at the end of 2007 is to *encourage sustainable consumption and production, considering social and economic development, respecting the load capacity of the ecosystems and dissociating the economic growth of environmental degradation*.

Waste constitutes a crucial aspect within the area of environmental policy, and in particular, for very industrialised countries, and also for those with urban settlements in large population nuclei. In response to this kind of problem, the relationship between the efficient use of resources and waste generation and management has been indicated as one of the keys, both in the EU Sustainable Development Strategy and in the 6th Environmental Action Programme 2002-2012, establishing the main objective of uncoupling the use of resources and waste generation from economic growth, and of consumption not exceeding environmental capacity. To do this, one of the main tasks during the coming years is waste management according to the following basic principles: reduction of the volume of waste, optimisation of recycling and reuse, and safe elimination.

The INE performs the Survey on the Collection and Treatment of Waste every year to measure the waste generated in Spain by the economic activity, as well as the treatment of waste.. The design of the survey follows the guidelines set out in European Parliament and Council Regulation (EC) 2150/2002, of 25 November, on waste statistics.

2 Objectives

The main objective of the survey is to quantify, in physical units, the waste generated by the set of industrial establishments, classified by type of waste, degree of hazard thereof, and activity generating it. Other additional objectives of the survey worth highlighting are:

To meet the needs of European Parliament and Council Regulation (EC) 2150/2002, of 25 November, regarding waste statistics, which also entails being able to establish comparisons on an international scale.

To complete the waste section in the joint questionnaire of OECD/Eurostat.

To have entry information available for compiling the waste satellite accounts.

3 Scope of the survey

3.1 POPULATION SCOPE

The target population of study is the set of statistical units that carry out operations on urban waste collection and/or treatment of waste. It also covers the elimination of solid waste by incineration or by other methods of reduction, as well as the dumping of waste and other inerting techniques.

3.2 TERRITORIAL OR GEOGRAPHICAL SCOPE

From the geographic point of view, the survey covers the set of the national territory.

For the purposes of their statistical exploitation, the survey is designed to facilitate, without limits and for the collection of urban waste, aggregate results by Autonomous Community. This aspect is of special interest for regional economic study and analysis.

3.3 TEMPORAL SCOPE

The survey is continuous and will be carried out annually. As to the information reference period, the data requested are referred to the natural year, which is object of the survey.

4 Framework and design of the survey

The reference framework of the survey is built out of the lists of authorized waste managers for the collection and/or treatment of waste (whether they are urban or not) provided by the Autonomous Communities and local administrations, updated with data available in the Central Company Directory (CCD) of the National Statistics Institute (INE).

The urban waste managers, in particular, are associated through a database auxiliary to the framework, to the municipality or municipalities where they render their services, including municipal services, or in charge of an association of municipalities.

The hazardous waste management units are investigated within the built framework, as well as all the non-hazardous treatment management units, with more than 5 employees in the company. The random sample of those companies that have less than 5 employees are also investigated, with exception of the indefinite activity units and those not identified within the CCD.

Regarding the urban waste collection, the theoretical sample of managers is obtained from a selection of a quota within the strata by size of the population concerned, in order to cover at least 70% of the population of the Autonomous Community. Once the unit is selected, the waste collected within all the municipalities are studied, regardless of their size. All the managers covering municipalities with more than 50,000 inhabitants are included, as well as nearly all the municipalities with more than 20,000 and a considerable representation of the rest of the municipal sizes. The final number of units included in the sample is around 1,800 units.

In the case of the collection of a certain type of urban waste (mixed domestic waste, glass, paper and cardboard, animal and vegetable waste and containers) were obtained considering the data supplied by the Ministry of Agriculture, Food and the Environment. The estimates corresponding to the remaining categories come exclusively from the aforementioned survey.

5 Variables and definitions

The definitions of waste included within the Act 22/2011, of 28 July, on waste and contaminated soils are the following:

Waste: any substance or object that its owner discards or has the intention or obligation to discard.

Hazardous waste: any waste that presents one or more of the hazardous characteristics listed in Annex III of Directive 2008/98/EC or approved by the Government, according to the European regulation or international conventions, to which Spain takes part, as well as the containers and packaging that contained this waste.

Non-hazardous waste: waste not included in the previous section

Collection: any operation consisting of collecting, classifying, grouping or preparing waste for its transport.

Selective collection: collection in which the waste stream is carried out separately, according to the type and nature, in order to facilitate the specific treatment.

Treatment: operations of recovery or elimination, as well as the preparation carried out before the recovery or elimination.

Other definitions:

Urban waste: domestic waste generated in particular addresses, trade and services for which the local authorities or provincial councils, when appropriate, have to offer a compulsory service of collection, transportation and treatment of waste. Indeed, the local entities will be able to manage non-hazardous commercial waste and the domestic waste generated by the industries. These tasks are carried out according to the legal framework established within the Act 22/2011, set by the Autonomous Communities and the sectoral regulations on the extended producer responsibility.

Municipal waste: For the purposes of the reporting obligations in respect of International organisations: (OECD Eurostat, ..) they consider: municipal waste those originated from the urban collection, which are the competence of the local entities or Autonomous Delegations, when appropriate, and that correspond to the following categories: metal, glass, paper and cardboard, plastic, wood, textile, discarded equipment, batteries and accumulators, animals and mixed food products, vegetables, domestic and similar, other mineral waste and soil.

Recovery operations: (including recycling, composting and regeneration). This includes all the disposal operations through out which the waste is transformed again into products, materials or substances, whether if it is with the original purpose or any other purpose. The disposal operations with the codes R2 and R11 of the Annex II of the Act 22/2011 are included, whereas the backfilling operations are excluded.

Dumping: this includes the deposits on the ground or inside it, discharges in places specially designed (for example landfill of inert waste, non-hazardous and hazardous), permanent storage, land treatment, deep injection and discharge into

the aquatic environment. The disposal operations with the codes D1 to D7 and D12 of the Annex I of the Act 22/2011 are included.

Incineration (with or without recuperation of energy): this includes the waste used in incineration or co-incineration plants as fuel in order to create energy, and those whose main purpose is the thermal treatment of waste in order to reduce their volume and danger and to obtain an inert product that can be eliminated. The disposal operations with codes D10 and R1 in the Annex I and II of the Act 22/2011 are included.

Backfilling operations: disposal operations consisting on the waste used in excavated areas (such as mines and gravel pits) for the recuperation of slopes (backfilling), for security or for landscaping engineering in which the waste can replace other materials –not considered to be waste– that would have to be used for the same purpose. This operation includes the use of waste for mines and gravel pit filling, recultivation, land recovery or landscaping.

European Waste Catalogue (EWC): This is a waste listing standardised to a European level. This waste is classified using six-digit codes for the waste, and four and two figures for subchapters and chapters, respectively. The chapters and subchapters define the types of activity that generate the waste.

Statistical Waste Classification (SWC): This is a waste nomenclature for statistical purposes, targeting substances, with categories encoded to 1-4 digits - from greater to lesser aggregation level - and with an additional distinction according to whether dealing with non-hazardous or hazardous waste.

Commission Regulation (EU) no. 849/2010, of 27 September, establishes the SWC currently in force, CER-Stat version 4, and the equivalence table with the European Waste Catalogue.

The following briefly describes the different types of waste:

Code CER-Stat	Non-hazardous	Hazardous
01.1	Solvents used	Chlorofluorocarbons, HCFC, HFC Solvents, cleaning liquids and organic and halogenated mother liquors Sludge or solid waste containing organic and halogenated solvents Mixtures of solvents
01.2	Acidic, alkaline or saline waste	Lime mud waste Saline waste that does not contain hazardous substances. Acid waste: hydrochloric, nitric and nitrous, phosphoric and phosphorous, sulphuric and sulphurous, hydrofluoric, etc. Waste etching solutions, pickling acids, bleach solutions and bleach fixer solutions Alkaline waste: Ammonia, sodium, calcium hydroxide. Waste from the cleaning of fuel with bases Saline waste: Solid salts and solutions containing cyanides, heavy metals, arsenic. Phosphatising sludge Salt slag from the secondary production of aluminium

Code CER-Stat		Non-hazardous	Hazardous
01.3	Spent mineral oils (does not include food preparation)		Engine, gear and lubricating oils (chlorinated, unchlorinated, synthetic, biodegradable, etc.) Hydraulic oils (containing mineral oil, synthetic oil, etc.) Oil from oil/water separators Insulating and heat transmission oils Tank bottom sludge and sludge from desalinisation of petroleum refining Spent waxes and fats
01.4	Chemical waste	Spent catalysts containing precious metals (gold, silver, rhodium, platinum, etc.)	Spent catalysts containing transition metals or dangerous transition metal compounds Spent catalysts containing phosphoric acid Spent catalysts contaminated with dangerous substances
02	Chemical waste (except 2.3)	Agrochemical product waste Unused medicines Paints, varnishes, inks and adhesive waste not containing dangerous substances Aqueous sludge containing inks, paints, varnishes, adhesives and sealants not considered to be dangerous substances Waste printing toner not containing dangerous substances Gases in pressure containers	Agrochemical product waste containing dangerous substances Unused medicines (cytotoxic and cytostatic) Paints, varnishes, inks and adhesive waste containing dangerous substances Wood preservatives Waste printing toner containing dangerous substances Unused explosives Gases in pressure containers
02.3	Mixed chemical waste	Mixed chemical waste not containing dangerous substances.	Packaging containing residues of or contaminated by dangerous substances
03.1	Chemical waste	Absorbents, filter materials, wiping cloths and protective clothing contaminated by non-dangerous substances Green liquor sludge (from recovery of cooking liquor) Tars and non-hazardous carbonaceous waste, such as asphalt and bitumens	Absorbents, filter materials, wiping cloths and protective clothing contaminated by dangerous substances Waste from liquid fuels: gasoline, fuel, oil, gasoil and other fuels (including mixtures) Oil and water emulsion sludge (bilge oils and oil/water separator contents) Chemical reaction waste (for example: aqueous washing liquids and mother liquors in organic chemical processes, etc.) Filter cakes and absorbents used in halogenated organic chemical processes Tars and hazardous carbonaceous waste, such as acidic tars, soot, etc.
03.2	Industrial effluent sludge (equivalent amount in dry material)	Sludge from on-site effluent treatment that do not contain dangerous substances Waste from cooling columns and from cooling water treatment Aqueous sludge from boiler cleansing	Sludge from on-site industrial effluents that contain dangerous substances Waste from cooling water treatment containing oils Aqueous sludge from boiler cleansing containing dangerous substances Sludge or waste containing hydrocarbons
03.3	Sludge from waste treatment (equivalent amount in dry materials)	Liquors and digestate from the treatment of animal and vegetable waste Liquors and digestate from the treatment of municipal waste Landfill leachate not containing dangerous substances	Landfill leachate containing dangerous substances Liquors and digestate from the treatment of municipal waste containing dangerous substances Waste from liquid fuels containing dangerous substances, from waste incineration

Code CER-Stat		Non-hazardous	Hazardous
05	Medical and biological waste	Sharps Human or animal medical waste whose collection and disposal are not subject to special requirements in order to prevent infection	Waste whose collection and disposal are subject to special requirements in order to prevent infection (for example: infectious animal corpses)
06.1	Ferrous metal waste and scrap (including packaging)	Ferrous metal waste and scrap (iron and steel) Mill scales Ferrous metal dust, particles, scales and chips Ferrous metal cables not containing dangerous substances	
06.2	Non-ferrous metal waste and scrap	Non-ferrous metal waste and scrap (aluminium, copper, bronze, lead, brass, zinc, tin, etc.) Ferrous metal dust, particles, scales and chips Non-ferrous metal cables not containing dangerous substances	
06.3	Mixed ferrous and non-ferrous metal waste (including packaging)	Metallic packaging Mixed ferrous and non-ferrous metal waste and scrap Mixed ferrous and non-ferrous metal dust, particles, scales and chips	
07.1	Glass waste (including packaging)	Glass Glass dust and fine particles from the production of glass products Glass containers (for example: glass bottles)	Waste from small particles of glass and glass dust containing heavy metals (for example: cathode tubes)
07.2	Paper and cardboard waste (including packaging)	Paper and cardboard waste Paper and cardboard packaging	
07.3	Rubber waste	Used tyres	
07.4	Plastic waste (including packaging)	Plastic waste Uncontaminated plastic containers	
07.5	Wooden waste (including packaging)	Sawdust, shavings, cuttings, wood, particle board and veneer not containing dangerous substances Wooden containers or packaging	Sawdust, shavings, cuttings, wood, particle board and veneer containing dangerous substances
07.6	Textile waste	Worn clothing Textile packaging Textile fibre waste Waste from tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium	
07.7	Waste containing PCBs		Hydraulic oils containing PCBs Components, transformers, condensers and other discarded equipment containing PCBs Construction and demolition waste containing PCBs

Code CER-Stat		Non-hazardous	Hazardous
08	Discarded equipment (except 08.1 and 08.41)	Electric and electronic equipment not containing dangerous components Brake pads Non-dangerous components removed from discarded equipment	Oil filters Fluorescent tubes and other mercury-containing waste Large household appliances containing chlorofluorocarbons, HCFC, HFC (for example: washing machines, refrigerators) Discarded electric and electronic equipment containing dangerous components Dangerous components removed from discarded equipment
08.1	Discarded vehicles	Discarded vehicles not containing liquids or other dangerous components	End-of-life vehicles
08.41	Battery and accumulator waste	Alcaline batteries without mercury Batteries and accumulators not containing dangerous substances	Lead batteries Mercury-containing batteries Ni-Cd batteries/accumulators
09.1	Animal waste and waste from mixed food products	Animal-tissue waste Materials for the preparation of meat, fish and other foods of animal origin that are not adequate for consumption. Also the sludge from washing and cleaning in these processes Mixed waste from food preparation and products (for example: Waste from preservatives, biodegradable kitchen and canteen waste) Edible oils and fats and mixtures of fats and oils from oily/water separation	
09.2	Green waste	Biodegradable green waste Plant-tissue waste Sludge from washing, cleaning, peeling, centrifuging and separation in preparing fruit, vegetables, grains, cocoa, tobacco, etc., production of preserves and yeast Waste from washing, cleaning and mechanical reduction of raw materials in the production of beverages Materials unsuitable for consumption or processing of all the above activities, and of the bread and pastry bakery industry Waste from alcohol distillation	
09.3	Animal faeces, urine and manure	Animal faeces, urine and manure, effluent, collected separately and treated off-site	
10.1	Domestic waste and the like	Mixed waste similar to that generated in households (not separated into differentiated fractions for selective collection - paper, packaging, organic material-) Mixed waste from canteens and markets.	

Code CER-Stat		Non-hazardous	Hazardous
10.2	Mixed and undifferentiated materials	<p>Compound/mixed containers and packaging (for example: those placed in containers for the municipal selective collection of packaging)</p> <p>Mechanically separated rejects from the pulping of waste paper and cardboard</p> <p>Waste from the sorting of paper and cardboard destined for recycling</p> <p>Other mixed and undifferentiated materials that do not contain hazardous waste (not including the waste from section 10.3)</p>	<p>Inorganic and organic waste containing hazardous waste</p> <p>Metal waste contaminated by dangerous substances</p> <p>Cables containing oil, coal tar and other dangerous substances</p>
10.3	Waste from separation	<p>Reject fraction and combustible waste (not hazardous) generated in the physical-chemical waste treatment</p> <p>Reject fraction of municipal, animal or green waste generated in the aerobic treatment of solid waste</p> <p>Waste for fuel or other waste (mixtures of materials) from mechanical waste treatment</p> <p>Light fragmentation fractions (<i>fluff-light</i>) and dust</p>	<p>Reject fraction and combustible waste (hazardous) generated in physical-chemical waste treatment</p> <p>Waste for fuel or other waste (mixtures of materials) that contain dangerous substances from mechanical waste treatment</p> <p>Light fragmentation fractions (<i>fluff-light</i>) and dust</p>
11	Common sludge	<p>Biodegradable sludge from the treatment of wastewater generated in the preparation and elaboration of animal and vegetable products and beverages.</p> <p>Sludge from the purification of drinking and process water</p> <p>Sludge from the treatment of urban wastewater</p> <p>Waste from sewer cleaning</p>	
12.1	Construction and demolition waste	<p>Waste from concrete, bricks, plasters generated in construction and demolition activities</p> <p>Waste from mixed construction</p> <p>Waste from hydrocarbonised road-surfacing material (for example: non-dangerous bituminous mixtures)</p>	<p>Waste from concrete, bricks, plasters generated in construction and demolition activities containing dangerous substances</p> <p>Waste from hydrocarbonised road-surfacing material (for example: dangerous bituminous mixtures, cal tar pitch and tar products)</p> <p>Glass, plastic, wood or other waste from construction and demolition that contain dangerous substances or are contaminated by them</p>
12.2	Asbestos waste		<p>Metallic packaging containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers</p> <p>Waste containing asbestos from electrolysis</p> <p>Brake pads containing asbestos</p> <p>Waste from fiber cement siding manufacture containing asbestos</p> <p>Discarded equipment containing free asbestos</p> <p>Construction or isolation materials containing asbestos</p>

Code CER-Stat		Non-hazardous	Hazardous
12.3	Waste from naturally occurring minerals	<p>Waste from the extraction of metallic and non-metallic ores</p> <p>Mineral waste generated in the physical and chemical transformation of metallic ores (for example: Sterile, dust, powdery waste, red sludge from alumina production)</p> <p>Mineral waste generated in the physical and chemical transformation of non-metallic ores (for example: Sterile and other waste from the washing and cleaning of minerals; gravel and crushed rocks; sand, clays, dust; waste from stone cutting and sawing)</p> <p>Drilling sludge and other drilling waste (without hydrocarbons).</p> <p>Soil from cleaning and washing beets.</p> <p>Aqueous sludge containing ceramic materials</p> <p>Waste from the preparation of mixtures prior to thermal processing in glass manufacturing.</p> <p>(All of them not containing dangerous substances)</p>	<p>Acid-generating tailings from the processing of sulphide ores</p> <p>Waste and sterile containing dangerous substances from the physical and chemical transformation of metallic and non-metallic ores.</p> <p>Drilling muds and other drilling waste containing dangerous substances</p>
12.4	Waste from combustion	<p>Waste from flue gas purification generated in electrical or combustion plants (not including those from waste treatment plants)</p> <p>Sludge and filter cakes from gas treatment</p> <p>Solid waste from gas treatment</p> <p>Slag, ashes and boiler dust from thermal treatment and combustion</p> <p>Particles and dust</p>	<p>Solid waste from gas treatment; sludge and filter cakes from gas treatment; flue-gas dust containing dangerous substances</p> <p>Slag, ashes and boiler dust from thermal treatment and combustion containing dangerous substances</p>
12.5	Different mineral waste	<p>Artificial mineral waste (for example: Off-specification calcium carbonate in sugar preparation, glass-polishing and -grinding sludge, waste from ceramics, bricks, roof tiles - after the cooking process-)</p> <p>Waste from refractory materials (casting moulds and cores not containing dangerous substances)</p>	<p>Artificial mineral waste containing hazardous waste (for example, glass-polishing and -grinding sludge, sludge from zinc hydrometallurgy, mills and spent grinding materials, etc.)</p> <p>Waste from refractory materials (casting moulds and cores containing dangerous substances)</p>
12.6	Soil	<p>Soil and stones (including excavated) from construction and demolition activities</p> <p>Soil and stones from parks and gardens</p>	<p>Oil spills from oil refining activity</p> <p>Contaminated soil (soil and stones)</p>
12.7	Dredging spoils	Unpolluted dredging spoils	Dredging spoils containing dangerous substances
12.8	Waste from waste treatment	<p>Waste from the incineration or pyrolysis of waste (for example: ash, slag and sand from fluidised beds) generated in waste treatment installations</p> <p>Mineral waste (sand and stone) generated from sorting, crushing, compacting or pelletising in waste treatment installations</p>	<p>Hazardous waste from the incineration or pyrolysis of waste (for example: slag) generated in waste treatment installations</p> <p>Waste from flue-gas cleaning in oil regeneration</p>

Code CER-Stat	Non-hazardous			Hazardous
13	Solidified, stabilised vitrified waste	or	Non-hazardous vitrified waste Non-hazardous stabilised solidified waste.	and Waste marked as hazardous, partly stabilised Waste marked as hazardous, solidified

6 Collection of the information

6.1 QUESTIONNAIRE

There is just one questionnaire and the informant unit must fill in the accountable data and exclusively the sections with the amounts collected of urban waste and/or with the amounts of waste treated, both urban or non-urban, by type of operation. The amounts are expressed in tonnes.

6.2 ORGANISATION OF THE FIELDWORK

The collection of information is carried out by sending the questionnaire by mail and with telephonic support. The informants also receive information about the fulfilment of the questionnaire via Internet or fax. The questionnaire is sent to all the companies that take place of the sample. Together with the questionnaire, the informant units receive in each submission the fulfilment conditions for the questionnaire, including the tables of equivalences between the European Waste Catalogue (EWC) and the European Waste List (EWL).

The statistical assistants complement the collection tasks. They phone the companies that have not returned their questionnaire by mail within the required period, with the object of requesting information, advising them if necessary and obtaining the questionnaire filled in. The assistants may also carry out tasks supporting collection such as directory updates, control and revision of the questionnaires, etc.

6.3 COMPUTER MANAGEMENT OF THE SAMPLES FILE

The management of the sample company files, for both the collection control and the data update of the informant companies, is carried out by means of an IT application established for this purpose. This application guarantees the efficient control of the process since the beginning of the questionnaire, given that the systematic errors of fulfilment of the questionnaires can be detected at the early stage of the questionnaire, making the correction easier.

7 Processing of the information

7.1 VALIDATION OF THE DATA

First of all, a control of the atypical data on the appropriate ratios is carried out. To those confirmed after the telephone support, we apply statistical standard techniques of atypical data. The interannual variations are analysed in both the microdata level and the category level of the waste generated in each treatment operation. The estimates obtained are contrasted with data provided by external sources. This way, the causes of the potential disparities are investigated in order to carry out the adjustments needed.

Information Coverage controls are carried out in order to detect duplicates and coverage errors and to carry out the first quality assessment of the variables collected by the questionnaires.

Once the microdata file is available, the detection and debugging of errors and inconsistencies of the identification variables of each registry are carried out. Indeed, different phases of depuration of errors of content (lack of partial answer). Then, the tables that detect and analyse errors and inconsistencies are constructed.

8 Estimators

Given the selection proceeding, design weigh corrected by the incidences of the survey are implemented in order to estimate the data on the collection and treatment or waste.

Regarding the collection of urban waste, the sample data is corrected with a ratio estimator used as an auxiliary variable to the populating residing in municipalities excluded from the effective sample.

In the case of the collection of a certain type of urban waste (mixed domestic waste, glass, paper and cardboard, animal and vegetable waste and containers) were obtained considering the data supplied by the Ministry of Agriculture, Food and the Environment. In these cases, there won't be any error associated to the sample.

The treatment tables include the data on waste treatment regardless of the origin of those (urban or not urban). The estimate by direct observation of some waste categories is not possible and, for that reason, these categories have been estimated by means of a conciliation with the corresponding figures of generation and adjustment with external sources.

9 Tables of results

The tables of results try to offer a basic and, at the same time, relevant information of the main results of the survey. This results will meet the demand on information or the different users.

The detailed results are published on a national level and by Autonomous Community, for the main categories of domestic waste generated in particular addresses, trade and services, except those , while those of the Autonomous Cities of Ceuta and Melilla are not published, as the sample sizes thereof produce inefficient estimates, or estimates with an impact on confidentiality.

The results of waste treatment are published on a national level, detailed by type of waste, type of treatment and danger condition.