Energy Consumption Survey (ECS)

Methodology

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1. Introduction

The dissemination of the results of the Energy Consumption Survey (ECS) offers different users basic information for the knowledge and analysis of the consumption of different types of energy products in the industrial sector.

The Energy Consumption Survey was implemented in reference year 2001, and biennially since then, has offered detailed information on the different types of energy consumption in industry. In 2009, the survey was revised in order to adapt its sectorisation to the new 2009 National Classification of Economic Activities (CNAE-09).

The following sections describe the general methodological lines of the survey, its units and research scopes, the sample design, the data collection system, the data processing, and the scheme for the dissemination of the results.

2. Theoretical framework of the survey

The Energy Consumption survey is designed, from a theoretical and conceptual perspective, on the bases of two essential principles: On the one hand, the need to increase, as little as possible, the workload for the informant units, and on the other hand, the idea of reaching a coherence between the results obtained and those provided by the structural survey of the industrial sector (Industrial Companies Survey - ICS). The entire methodological development of the survey has been based on this starting point, whose approaches directly affect the different components of its implementation.

The integration of the survey within the framework of the structural surveys has been carried out using the following elements:

a) Methodological integration: Common nomenclature, unit correspondence, coincidence of definitions and of assessment criteria.

b) Integration of the sample design: Use of a common directory-framework and obtaining of the ECS as a subsample of the previous sample of the ICS.

c) Integration of the collection methods: Simultaneous collection and collection by the same teams of both surveys, for the purpose of attaining a greater efficiency in the management of the whole process, rationalising and limiting the necessary contacts with the informant units.

d) Integrated filtering processes: Integration of the processes of error detection and correction, and formulation of joint "edits" between the two surveys, for the purpose of optimising the processing and achieving the greatest coherence possible between the primary data of each survey.

e) Estimation procedure: Exploitation of the auxiliary information generated by the ICS for the calculation of the ECS estimators, for the purpose of obtaining coherent information on a sample stratum level.

3. Survey units

The basic unit used for the survey is the industrial company. A company is considered to be any legal entity that constitutes an organisational unit that produces goods and services, and that enjoys a certain autonomy in decision-making, mainly at the time of using the available current resources. The company may carry out one or more activities in one or more places.

A company is considered to be industrial, for the purposes of the survey, if its main activity is included in Sections B ("mining and quarrying industries") or C ("manufacturing industry") of the National Classification of Economic Activities (CNAE-09).

In the survey unit scheme, the company simultaneously assumes the roles of informant unit, that which facilitates the information requested in the survey, and of observation unit, that to which the data requested on the questionnaire refers.

4. Research scopes

The target population of study of the survey is the group of companies with 20 or more employed persons, and whose main activity is included in Sections B (mining and quarrying industries) or C (manufacturing industry) of CNAE-09. Not forming a part of the research scope of the survey are those industrial activities belonging to Sections D (supply of electrical energy, gas, steam and air conditioning belonging) and E (water supply, waste management and decontamination activities).

For the purposes of the survey, the main activity of the company is considered to be that which generates the greatest added value. If this information is not available, the survey will use the activity that generates the greatest production value, or in its absence, that which requires the greatest number of employees.

From the geographical perspective, the survey covers the entire country, except Ceuta and Melilla.

The survey is carried out biennially. As to the information reference period, the data requested refers to the target calendar year of the survey. Exceptionally, companies that function by season or campaign, that include two different years and have their data accounted for as such, must refer the information to the season or campaign that finished in said year.

5. Sample design

The target population of study of the survey, that is, the group of industrial companies with 20 or more employed persons, has been divided, for the purposes of the sample design, in a group of strata. Stratification has been carried out with the activity and size bracket variables. Each of the classes (4-digit level) of CNAE-09 has constituted an independent population for sampling purposes. Within each of the classes studied, a limit of 250 employed persons has been established in order to delimit the set of companies that have been studied by sampling. Companies

with 250 or more employed persons have been studied comprehensively, whilst companies with fewer than 250 employed persons have been studied by sampling. Nevertheless, comprehensive research has been conducted of certain strata, as long as the population size prevents the selection of a sample that could be considered representative. The size brackets defined have been the following:

Size brackets

1 - 20 to 49 employed persons

2 - 50 to 99 employed persons

3 - 100 to 249 employed persons

4 - 250 to 499 employed persons

5 - 500 to 999 employed persons

6 - 1000 or more employed persons

Given that the objective of the survey is to obtain broken down information from the different types of energy consumption carried out by companies, and that in the Industrial Companies Survey (ICS), there is information regarding the total of that consumption, the ECS sample has been selected with a subsample of the total ICS sample, for the purpose of achieving a greater integration in the results of both investigations.

The sampling sizes established in each of the brackets have been as follows:

Bracket size	Sampling fraction	
1	20 %	(with a minimum of 4 units and a maximum of 30)
2	42 %	(with a minimum of 4 units and a maximum of 30)
3	64 %	(with a minimum of 4 units and a maximum of 30)
4	100 %	
5	100 %	
6	100 %	

The total size of the sample is approximately 5,800 companies, accounting for a fraction of 32% of the global sampling over the population studied.

The selection of companies from the sample, within each stratum, has been carried out bearing in mind the need for them to belong to the sample of the Industrial Companies Survey (search for coherence) and with negative coordination with the samples of other surveys (distribution of the individual response workload).

6. Data collection

The data collection of the survey begins in the second quarter of the year following the information reference year. Companies have the possibility of providing the data requested in the sample, either online, or by filling in the questionnaires mailed by post to those companies forming part of the sample.

The personnel in the units responsible for the fieldwork carries out the collection tasks, in accordance with the previously established work quotas, and contacts those companies that have not provided the data within the foreseen term, for the purpose of asking them for the information and advising them as necessary. The collection units are likewise responsible for the recording of the questionnaires, and for a first control and filtering of the data.

The management of the file of companies in the sample, both to control the collection, and to update the data on informant companies, is carried out by means of a computerised application established for this purpose, which enables guaranteeing the control and organisation of the entire process. The information updated in the database from each collection unit is sent every 15 days, together with the questionnaires received, to the survey Promoter Unit, which transfers this information to the central database. Likewise, every 15 days, the file with the questionnaires recorded up to that moment are sent. This system facilitates supervising the collection continuously, integrating the collection and filtering processes , guaranteeing an efficient control of the process from the beginning of the survey, as systematic errors in filling in and interpreting the questionnaires may be detected in the initial phases of the survey, thereby facilitating their correction.

7. Data processing

The initial stage of the survey information processing coincides in time with the fieldwork itself, and is carried out in parallel to the data collection, during the entire duration thereof. The established system allows for carrying out a continuous updating process, as well as a first control of questionnaire content filtering, included in the recording process itself. Its objective is to establish sufficient levels of quality that will permit a significant simplification of the subsequent information processing.

The recording of questionnaires is carried out by the collection units themselves, establishing the control norms necessary to guarantee an adequate level of quality for the entire process. This facilitates controlling, already in this phase, the errors that may affect the data obtained from the informant units.

Once the recording of the questionnaires is carried out, and the information is available through electronic means, the process of detection and filtering of errors and inconsistencies continues in the survey Promoter Unit. Depending on the

characteristics of each type of error, either automatic imputation procedures or updates (in batches) of the file are carried out, for the purpose of incorporating the corrections of the errors detected. The micro-filtering phase is carried out in an integrated manner, with the error detection of the Industrial Companies Survey, enabling a more effective control of the correction process and higher levels of global quality, on exploiting the information from two different statistical sources. The last stage prior to the dissemination of the results is the obtaining of analysis tables, which may be necessary to eliminate the possible errors or inconsistencies detected therein.

8. Dissemination of the results

The data that is disseminated online offers detailed information on the industrial consumption of the different energy products, for the purpose of satisfying the demand for information of different users of the survey.

Results are provided, both on a national level and broken down by Autonomous Community.

National results are presented in two differentiated blocks:

a) Results by activity grouping. For each one of the 11 activity groupings belonging to the mining and quarrying and manufacturing industries, information is provided regarding the consumption of energy products at the following level of detail:

- Hard coal and derivatives.

- Diesel

- Fuel oil

- Other petroleum products

- Gas

- Electricity

- Other energy consumption

b) Results by activity sector: For each one of the 96 activity sectors into which the mining and quarrying and manufacturing industries have been divided, information is provided on the energy consumption, with the following breakdown:

- Hard coal and derivatives.

- Petroleum products.

- Gas.

- Electricity.

- Other energy consumption.

The results, broken down for each one of the 17 Autonomous Communities, are presented with the following degree of detail:

- Hard coal and derivatives.

- Diesel

- Fuel oil

- Other petroleum products

- Gas

- Electricity

- Other energy consumption