



**An  
Phríomh-Oifig  
Staidrimh**

Central  
Statistics  
Office

# **Standard Report on Methods and Quality for Business Energy Use Survey 2018**

**Standard Report  
on  
Methods and Quality  
for  
Business Energy Use Survey**

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CENTRAL STATISTICS OFFICE  
Skehard Road, Cork, T12 X00E  
(+353) (0)21 453 5000  
[www.cso.ie](http://www.cso.ie)

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## **1 Overview**

The Business Energy Use (BEU) Survey is an annual survey conducted by the Central Statistics Office (CSO) collecting information about energy use by businesses resident in Ireland.

## **2 General Information**

### **2.1 Statistical Category**

Statistical survey combined with administrative data.

### **2.2 Area of Activity**

Environment and Climate – Energy statistics

### **2.3 Organisational Unit Responsible, Persons to Contact**

Email: [environment@csso.ie](mailto:environment@csso.ie)

Environment and Climate Division:

Dympna Corry

Tel: +353 (0)1 4984207

Business Statistics Data Collection Unit:

Mary Heanue

Tel: +353 (0)21 4535714

### **2.4 Objectives and Purpose**

The survey collects information about energy products including Electricity, Natural Gas, Petroleum products, Solid Fuels, Renewable Energy and Energy from Waste, Heating/Air Conditioning and Transport energy products. Most questions collect data on the quantity used and cost of each energy product purchased.

The survey was first conducted by the CSO for reference year 2009.

### **2.5 Periodicity**

Annual

### **2.6 Client**

The results of the survey are used for many purposes. The Sustainable Energy Authority of Ireland (SEAI) use them in compiling energy balances. The CSO's National Accounts Division use them

for Supply and Use Accounts. The results will be an input into the compilation of Ireland's greenhouse gas emissions inventory and provide important information on climate change in Ireland.

## **2.7 Users**

- CSO
- SEAI
- Environmental Protection Agency (EPA)
- Eurostat
- Government Departments
- Other agencies and interest groups
- General public

## **2.8 Legal basis**

The survey is carried out under Commission Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics. The 2018 survey was conducted under the Statistics (Business Energy Use Survey) Order 2018 (S.I. No. 509 of 2018) made under the Statistics Act, 1993.

# **3 Statistical Concepts, Methods**

## **3.1 Subject of the Statistics**

To collect information about energy use by enterprises.

## **3.2 Units of Observation/Collection Units/Units of Presentation**

The survey is issued to enterprises with 10 or more persons engaged in NACE Rev. 2 sectors: B-F (includes Industry & Construction) and G-N, R-S (Services). In 2017, the coverage broadened to include enterprises with 3-9 employees and more NACE sectors.

Approximately 5,000 forms were issued in the 2018 survey. The CSO's Central Business Register is used to select the list of enterprises in the survey.

Results are expressed in (i) original units (e.g. kilowatt hours), (ii) thousand tonnes of oil equivalent (ktoe) which is a common unit of measurement which enables quantities of different fuels to be compared and aggregated, and (iii) thousand euro.

## **3.3 Data Sources**

- CSO Business Register
- CSO Census of Industrial Production and Annual Services Inquiry
- SEAI administrative data

- EPA administrative data

### **3.4 Reporting Unit/Respondents**

Enterprise.

### **3.5 Type of Survey/Process**

100% sampling: All enterprises with 250 or more persons engaged.

Stratified random sample: 10 to 249 persons engaged.

Enterprises with 3 to 9 persons engaged were included for the first time in the 2017 survey.

### **3.6 Characteristics of the Sample/Process**

#### **3.6.1 Population and Sampling Frame**

The 2018 survey population was made up of all enterprises in NACE Rev. 2 sectors B-F (includes Industry & Construction) and G-N, R-S (Services) with 3 or more persons engaged. The sampling frame was the CSO's Business Register.

#### **3.6.2 Sampling Design**

A full list of all relevant enterprises is generated for this coverage using the CSO Business Register. This population is subdivided into strata which were NACE Rev. 2 by seven employment size classes:

<b>Sample</b>	<b>Employment Size Class</b>	<b>Number of persons engaged</b>
Random Sample	1	3-9
Random Sample	2	10 to 19
Random Sample	3	20 to 29
Random Sample	4	30 to 39
Random Sample	5	40 to 49
Random Sample	6	50 to 249
Census	7	250 or more

A census is conducted of all enterprises with 250+ persons engaged. A sample of enterprises is taken for those remaining enterprises with 3 to 249 persons engaged. Neyman allocation is used to select the sampling fraction in each of these remaining strata.

### **3.7 Survey Technique/Data Transfer**

The data was available for completion by postal form or on the CSO website as an e-Form. This data was captured by the CSO's Data Management System, where it can be viewed and edited as required. SAS programs were used for the processing of the survey.

### 3.8 Questionnaire (including explanations)

The survey form can be viewed at <https://www.cso.ie/en/methods/surveyforms/businessenergyuse/>

The survey collects information about energy usage by businesses in Ireland during a calendar year reference period. The principal variables collected relate to numerous energy products including:

- Electricity;
- Natural Gas;
- Petroleum products;
- Solid Fuels;
- Renewable Energy and Energy from Waste;
- Transport energy products; and
- Heating / Air Conditioning.

### 3.9 Participation in the Survey

The 2018 survey was conducted under the Statistics (Business Energy Use Survey) Order 2018 (S.I. No. 509 of 2018) made under the Statistics Act, 1993 which imposed a legal obligation on enterprises to respond.

### 3.10 Characteristics of the Survey/Process and its Results

The BEU survey collects specific data relating to business energy usage. The 2009-2018 results were published on the CSO website as a statistical release.

### 3.11 Classifications used

The statistical classification of economic activities in the European Community, NACE Rev. 2, is used for the BEU survey. The relevant sectors from this classification are:

Section	Description
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and Storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities



O	Public Administration and Defence; Compulsory Social Security
P	Education
Q	Human Health and Social Work Activities
R	Arts, entertainment and recreation
S	Other service activities

### **3.12 Regional Breakdown of Results**

Energy consumption is produced at county level.

## **4 Production of the Statistics, Data Processing, Quality Assurance**

### **4.1 Data Capture**

The 2009-2013 survey was available for completion as a postal form and on the CSO website as an e-Form. The data were captured in the CSO's Data Management System (DMS). SAS programs were used for processing the survey. More recent surveys have not included a paper questionnaire option.

### **4.2 Coding**

No survey questions required coding. The respondent indicates the energy unit that quantities are being given in e.g. kilowatt hour.

### **4.3 Data Editing**

The data received from the survey e-Form was uploaded into the DMS and edited on-screen by CSO staff. Edit rules were set up on the DMS to check for inconsistencies in the returns. A listing of all the failed edits is examined. The image of the form is called up on the PC screen and the reason for the edit failure is identified on the form. Each failed edit is checked for any errors and for any comment on the form that may explain the failure.

If the edit failure cannot be resolved by CSO staff, then the enterprise is contacted to attempt to resolve the issue. Once all errors are amended a copy is made of the clean dataset. Reports are run during the survey period recording the number of forms returned by NACE group and employment size to monitor the response rate. In addition, reports are run to estimate the number of edits outstanding.

More detailed edit programs were run in SAS to perform checks on the consistency between questions and to check returns with other data including previous years returns.

### **4.4 Imputation (for Non-Response or Incomplete Data Sets)**

The survey returns are weighted to the Business Register. Non-response is corrected through higher weighting factors. Survey returns with no energy purchases are included with the survey returns e.g. a business that was temporarily closed for the survey year.

#### **4.5 Weighting**

The survey returns are combined with other survey and administrative data before weighting. The weights are calculated at NACE Rev.2 Division level. Some non-typical returns were given a weight of one which results in other responses being given a higher weighting.

#### **4.6 Computation of Outputs, Estimation Methods Used**

By combining the survey returns with other data sources, it sometimes happened that an enterprise was in more than one data source. In these cases, the returns were compared, and an integrated return was constructed. While the survey collected both quantity and cost data, some of the other data sources did not have both. The survey returns were used to apply unit costs at energy product level. In this way, both quantity and cost data were calculated for all returns.

#### **4.7 Other Quality Assurance Techniques Used**

The sample is selected from the latest version of the CSO's Business Register. Duplicate enterprises and companies that had ceased trading before the survey year were removed from the sample.

### **5 Quality**

#### **5.1 Relevance**

Fuel purchases are a substantial portion of enterprise costs and are a cause of pollution. Hence there is a large policy interest in understanding the amount of energy used by different enterprise sectors and in monitoring take-up on more energy efficient and less polluting fuels.

#### **5.2 Accuracy and Reliability**

##### **5.2.1. Sampling Effects, Representativeness**

A representative sample is taken of all enterprises with 3 to 249 persons engaged and a full census of enterprises with 250 or more persons engaged is also taken. Some editing of the sample takes place to remove duplicates or enterprises that have ceased trading.

The core NACE sections generally remain consistent across each survey. The BEU 2013 was the fifth survey and the sample for enterprises with 10 to 249 persons engaged was selected to exclude companies that had been included regularly in earlier surveys. Every effort was made to ensure that there were enough responses in each cell to be representative of the sample and to ensure that confidentiality was maintained.

### **5.2.2. Non-Sampling Effects**

The CSO uses standard energy factors to convert quantities in different physical units to a common unit. These factors were obtained from the SEAI. The questionnaire has been updated over time to take account of the increased use and variety of renewable energy products.

#### **5.2.2.1 Quality of the Data Sources used**

The sample is taken from the CSO's Business Register. The additional data sources used are collected by public bodies with proven experience in energy statistics.

#### **5.2.2.2 Register Coverage**

From the 2017 survey onwards, the sample was amended to include enterprises with 3-9 employees as the survey results were being weighted to include these.

#### **5.2.2.3 Non-response (Unit and Item)**

Unit non-response – The response rate for the BEU 2018 was approximately 60%. The main reasons for unit non-response were as follows:

1. Company Gone-Away from the address on the survey form.
2. Duplicate – company received two forms with different reference numbers.
3. Company had ceased trading.
4. Form was returned blank.
5. There was a query about the survey form.
6. Company refused to respond.

The Business Statistics Data Collection Unit (BS DCU) staff investigated these issues and resolved them as appropriate e.g. ringing the company for confirmation of information, removing the company from the survey, etc.

Item non-response – The nature of the questions were such that many respondents will not have used many of the energy products e.g. wood waste. Hence the main method of identifying item non-response is by comparing the return with previous returns from the same enterprise.

Where a part of the form is not completed the following is done:

1. An attempt is made to automatically update the form using edit checks.
2. A manual check to see if the variable was captured in the previous survey for the enterprise in question and if the answer can be reused.
3. Enterprise contacted to confirm the details on the survey form.

#### **5.2.2.4 Measurement Errors**

(a) Questionnaire - We ensured that the questionnaire is clear with definitions provided as appropriate.

(b) Data collection method – postal form and electronic form (e-Form). Neither method was likely to be a source of measurement error.

(c) Interviewer - Field interviewers were not used by the survey.

(d) Respondent – Survey data can contain sensitive and confidential information. The introduction on the form referred to Section 33 of the Statistics Act, 1993 guaranteeing the confidentiality of all data returned to ensure that respondents are not reluctant to provide accurate information.

#### **5.2.2.5 Processing Errors**

Data Edits are run to check for the following:

- That all the relevant questions have been answered
- There is internal consistency in answers within the form
- There is consistency with returns for previous years

If the edit cannot be resolved locally, then the enterprise is contacted to confirm the returned data. The return is manually changed by BS DCU staff if required.

#### **5.2.2.6 Model-related Effects**

Modelling is not used to estimate survey results.

### **5.3 Timeliness and Punctuality**

#### **5.3.1 Provisional Results**

No provisional results are provided however the published results are subject to revision.

#### **5.3.2 Final Results**

The results are published on the CSO website. The target timeliness is within 27 months of the end of the survey period.

### **5.4 Coherence**

The 2009-2018 results were calculated using a consistent methodology. There should be a broad consistency between energy use and the emissions inventory data.

### **5.5 Comparability**

The results can be compared with SEAI energy balances and the cost of fuel purchases as estimated by the CSO Annual Services Inquiry and Census of Industrial Production.

## **5.6 Accessibility and Clarity**

### **5.6.1 Assistance to Users, Special Analyses**

Survey information and the survey form were available to users on the CSO website.

<https://www.cso.ie/en/methods/surveyforms/businessenergyuse/>

Specific user requests are acceded to where possible, and where confidentiality issues do not arise.

### **5.6.2 Revisions**

The results are subject to revision.

### **5.6.3 Publications**

#### **5.6.3.1 Releases, Regular Publications**

Statistical release on the CSO website.

#### **5.6.3.2 Statistical Reports**

Statistical release on the CSO website.

#### **5.6.3.3 Internet**

CSO website.

### **5.6.4 Confidentiality**

In line with Section 33 of the Statistics Act, 1993 all data are treated as strictly confidential. Appropriate confidentiality checking is run on data and as per the usual CSO requirements.

## **6 Additional documentation and publications**

SEAI energy balances:

<https://www.seai.ie/data-and-insights/seai-statistics/key-statistics/energy-data/>