

"ENVIRONMENTAL PROTECTION AND RESTORATION EXPENDITURE" STATISTICAL SURVEY METHODOLOGY

The statistical survey is conducted annually by the Environmental and Energy Accounts Department, Macroeconomic Statistics Directorate, of the National Statistical Institute, on the basis of mandatory participation, according to the National Statistical Program.

According to Art. 20 of the Statistics Act, respondents are obliged to provide the National Statistical Institute with reliable data on surveys included in the National Statistical Program, which are intended to be conducted on the basis of mandatory participation.

According to Art. 25, para. 1 of the Statistics Act, individual data obtained and collected during statistical surveys are confidential and can only be used for statistical purposes.

GENERAL INFORMATION

OBJECTIVE

The objective of the statistical survey is to provide information to all stakeholders and the public about the environmental protection expenditure accounts, in accordance with the requirements of Regulation (EU) No. 691/2011 on European environmental economic accounts.

ESSENCE

The environmental protection and restoration expenditure represent the economic resources intended for all activities and actions that have as their main goal the prevention, reduction and elimination of pollution and any other environmental degradation. These activities and actions include all measures taken to restore the environment after it has been degraded. This evaluates the financial commitment of an economy for the environmental protection, how environmental protection and restoration expenditure affect international competitiveness, the application of the polluter pays principle and cost effectiveness of environmental control mechanisms.

Environmental protection and restoration expenditure include: expenditure for the acquisition of tangible fixed assets with ecological use (TFAEU) and intangible assets with an ecological use (TIFAEU), which include expenditure for buildings, machines, means of transport, etc.; expenditure for maintaining TFAEU and expenditure for carrying out activities for the protection and restoration of the environment, which are formed by expenditure for materials, for external services, incl. amounts paid for wages, social security and allowances to personnel employed in enterprises and state administrations with activities related to environmental protection; other expenditure.

Expenditure for the acquisition tangible fixed assets and intangible assets include: invested funds for the construction of facilities, modernization and expansion of existing TFAEU, as well as those for licenses, know-how, patents and others; expenditure for acquisition of monitoring and control equipment.

The expenditure for maintaining TFAEU and carrying out measures for the protection and restoration of the environment include: the expenditure for operation and maintenance of TFAEU; the expenditure for conducting events not related to the use of TFAEU: reclamation, chemical melioration, biological and integrated plant protection, afforestation and landscaping

activities, landscape protection, incl. protected areas and sites; the expenditure for operation and maintenance of the monitoring and control equipment; expenditure for administrative activities related to environmental protection include data for the MOEW, EEA, Regional Inspectorate of Environment and Water, etc.

The environmental protection expenditure accounts present the relevant data in such a way that to be compatible with the data reported under the European System of Accounts (ESA 2010). These accounts enable the compilation of the national environmental protection expenditure.

They are part of the European economic accounts established in Regulation (EU) No. 691/2011 and compiled in accordance with the international standards of the System of Environmental Economic Accounting 2012-Central Framework - SEEA CF.

PURPOSE

Data on the expenditure of environmental protection and restoration, obtained as a result of the statistical survey, are used for the reporting under Regulation (EU) No. 691/2011 to the EC - DG Eurostat.

The data are published annually, according to the Release Calendar, on the NSI website for public information. They are also provided to various institutions or organizations in the country for evaluations and analyses.

STATISTICAL SURVEY

SCOPE, STATISTICAL UNIT AND GENERAL POPULATION

The statistical survey covers enterprises and kind-of-activity units from all economic activities. The statistical unit is enterprise and kind-of-activity unit.

The general population consists of active enterprises, kind-of-activity units from all economic activities.

The statistical survey is a combination of comprehensive and sample survey.

DATA SOURCES

- Statistical survey "Environmental protection and restoration expenditure";

- Administrative sources (Eurostat - published data from the BNB's balance of payments). Information from other statistical surveys (environmental statistics - "Public water supply, sewerage and treatment", structural business statistics, national accounts, statistics on foreign trade) is also used for defining the general population, data validation and making estimations.

FREQUENCY OF DATA COLLECTION AND PUBLICATION Annually.

STATISTICAL STUDY

DEFINING THE STATISTICAL POPULATION FOR THE STUDY

The statistical population is determined by statistical units (enterprises, kind-of-activity units from all industry groups with more than 10 employed persons included in the Statistical Business Register (SBR). Statistical units with less than 10 employees are excluded from the surveys, in order to reduce the respondents burden.

The selection of statistical units from the SBR takes into account type of the survey which includes a combination of comprehensive and sample survey.

The list of statistical units of the statistical population includes:

- **Statistical units for comprehensive survey.** They are determinated according to the SBR and comprise all enterprises with main and additional economic activity according NACE Rev.2 as follows: division 37 - Sewerage, division 38 - Waste collection, treatment and disposal activities; materials recovery, without group 38.3 - Materials recovery; division 39 - Remediation activities and other waste management services. Enterprises and kind-of-activity units with these main economic activities are specialised producers of environmental protection and resource management services. The list for comprehensive survey also includes statistical units for which we have information from previous statistical surveys that they have made expenses for environmental protection and bear the characteristic surveyed.

- For the part of non-covered statistical units, due to the large number of enterprises, simple random samples are selected. According to Regulation (EU) No. 691/2011, a separate sample is selected for each NACE Rev.2 division. As the reporting requirements impose disaggregation of the populations, it turns out that in some groups, the number of units surveyed is too large for comprehensive surey but small for sample survey. In this case, units are surveyed comprehensively.

Table 1 presents the selection method of the units for the statistical subpopulations for the "Environmental protection and restoration expenditure" survey.

To calculate the sample size, should be determined:

- The guarantee probability to guarantee the survey results and the related guarantee multiplier;

- The maximum size of the stochastic error;

- The standard deviation of employed persons.

A 95% confidence interval is chosen. Practically, this means that the confidence interval will contain the real population average with 95% probability.

The sample size is calculated using the formula:

$$n = \frac{t^2 (V\%)^2}{(\Delta\%)^2 + \frac{t^2 (V\%)^2}{N}}$$

where:

$\Delta\%$	-	Maximum error;				
t	-	- Guarantee multiplier (1.96 for an interval where the actual val				
		the average is with a 95% probability, and 2.58 for a 99% probability);				
V	-	Coefficient of variation - % (V%=100*standard deviation /Average				
• (

- % Arithmetical average);
 - Number of cases in the sample;

- Number of cases in the population syrveyed.

After determining the population, compiling the list of all population units and calculating the sample size, a simple random samples for each division group by NACE Rev.2 are selected, with SPSS software programme. We combine both lists - the list of statistical units for comprehensive survey and the list of units selected by simple random sampling. The population is updated annually before the start of the Campaign.

DATA COLLECTION

n

Ν

Primary data are collected from respondents for the previous reporting year. The data are collected via Environmental Statistics Information System (ESIS), which includes automatic checks for completeness, valid values, and logical data control, according to the specifics of the

survey. The nomenclatures used for its needs and instructions for the respondents are available in the system.

PRIMARY DATA PROCESSING, DATABASE PREPARATION

PRIMARY DATA PROCESSING

After the respondents have reported their data in ESIS, their processing begins. It is carried out in the system according to the survey program schedule and goes through several stages.

Data validation is carried out on the basis of clearly defined criteria regarding their completeness, correct classification, units of measure, comparability with previous years, logical control, etc.

All checks are done at the respondent level.

DATABASE PREPARATION

After finalising the process of removing all identified errors and discrepancies in the data, actions on classifying and coding the data related to the statistical units or collected variables are also taken. The purpose of these encoding procedures is to obtain derived variables, numerical values, or aggregate values during the next processing stages. The coding process is carried out using code tables. When new versions of the used classifications and nomenclatures appear, recoding and reclassification of statistical units and variables is carried out.

After completing these actions, the methodologists prepare the primary database for further processing and calculation the statistical data.

CALCULATION AND ANALYSIS OF STATISTICAL INDICATORS

DATA PREPARATION

Data preparation is a set of processes through which the primary data are brought into a form suitable for the statistical data calculation, analysis and assessment of their quality and the subsequent presentation to users, incl. fulfillment of reporting obligations to Eurostat, according to the specified table formats.

ASSESSMENT OF PRIMARY DATA RESPONSE RATE

Within the framework of the Campaign, reports should be collected from all survey respondents. In the event that 100% collection of primary data from respondents is not achieved, the need to assessment the missing data is assessmented and, if necessary, carried out.

STATISTICAL DATA CALCULATION

The following indicators are calculated from the database with final primary data:

- Expenditure for the acquisition of tangible fixed assets and intangible assets with ecological use by ecological classes;

- Expenditure for maintaining and operation of tangible fixed assets (TFA) with ecological use and the activities performed during the reference year, by ecological activities;

- Amounts paid for services performed, by ecological activities.

All general population parameters are estimated based on the sample data.

In the industry groups in which a sample is selected, an estimate is calculated as the average value of the relevant characteristic of one enterprise in the sample is multiplied by the number of the industry 's enterprises with more than 10 employees from the population.

This way, the estimated total value of the relevant parameters, for which the general is surveyed by sample, is obtained. The estimation is done only for the sample data. The sample estimation is burdened with error i.e. the estimated total value of the indicators is in the middle of the confidence interval, which is calculated as follows: estimated total value of the corresponding indicator by data from the sample -/+ maximum error (the stochastic error multiplied by the guarantee multiplier).

The maximum error is calculated using the following formula:

$$\Delta\% = \sqrt{\frac{t^2 V \%^2}{n} - \frac{t^2 V \%^2}{N}}$$

where:

Δ% t	-	maximum error; guarantee multiplier (1.96 for an interval in which the real
		value of the average lies with a probability of 95%)
V%	-	coefficient of variaton in % (V%=100*sample standard deviation/sample average, respectively Stdev and Average in Excel)
n	-	number of cases in the sample;
Ν	-	number of cases in the population surveyed.

To obtain the data for all enterprises in the population, the estimate of the data of the population surveyed by sample, where it is available for the relevant division group, is added to data of the enterprises of the comprehensively studied population.

In order to also evaluate the data of enterprises with less than 10 employees, the share of employees in enterprises with 10 or more employees from those employed in all enterprises from the population in the relevant division group is calculated (formula 1).

Formula 1:

$$D_{\ge 10} = \frac{\sum V16110_{\ge 10}}{\sum V16110} * 100 ,$$

where:

D _{≥10}	-	share of employees in enterprises with 10 or more
		employees from those employed in all enterprises from the
		population in the relevant division group;
$\sum V16110_{\geq 10}$	-	share of employees in enterprises with 10 or more
		employees in the relevant division group;
∑V16110	-	share of employees in all enterprises from the population
		in the relevant division group.

Data on the relevant indicators for enterprises with less than 10 employees is calculated according to formula 2.

Formula 2:

$$P_{\le 9} = \frac{\sum P_{\ge 10}}{D_{\ge 10}} * (100 - D_{\ge 10})$$

where:

 $\begin{array}{lll} P_{<9} & - & \text{estimation of the indicators of enterprises with less than 10} \\ & & \text{employees;} \\ \hline{P}_{\geq 10} & - & \text{data of the enterprises with 10 or more employees;} \\ D_{\geq 10} & - & \text{share employees in enterprises with 10 or more employees} \\ & & \text{from those employed in all enterprises from the population} \\ & & \text{in the relevant division group.} \end{array}$

The estimation of the relevant indicators for the enterprises with less than 10 employees is added to the estimated total value of the indicators for the enterprises with more than 10 employees, for which the population is examined by sampling.

Specialised software – Excel, SPSS and/or R – is used to calculate the data.

CONFIDENTIALITY

According to Regulation (EC) No. 223/2009 on European statistics and Statistics Act, the individual (primary) data of enterprises are confidential. In order to ensure their protection and the impossibility of being identified, the aggregated indicators are defined as confidential also when:

- Criterion A the indicator is formed by one or two enterprises;
- Criterion B one enterprise dominates the value of the indicator with a share equal to or greater than 85%.

QUALITY ASSURANCE

The statistical survey follows the General model of the statistical production process in NSI. The quality ssurance is carried out in order to guarantee compliance with the requirements of the Statistics Act. Data quality is ensured by the application of the European Statistics Code of Practice principles and NSS Common Framework for Quality Management.

To ensure high quality of the data, their consistency is checked with the data from the Structural Business Statistics, Non-Financial National Accounts, and statistics on foreign trade in goods, as well as with Environmental Goods and Services and Income and Revenues and expenditure for municipal waste and expenditure for water supply infrastructure and other statistics in NSI. Efforts are being made to continuously improve the quality of the data, by improving the primary data collection system through the online-based ESIS, ensuring strict arithmetic and logical control of the input data, and by performing additional analyzes and verifications.

With the preparation of the statistical data, a quality report is also prepared, which is filled in the Eurostat system for metadata and quality reports.

Quality report and metadata are also published on the NSI website together with the statistical data. They are updated annually and contain additional information related to the survey.

STATISTICAL PRESENTATION

The data on the environmental protection expenditure are presented at national level by:

- Type of economic activity, according to the classifications CEPA 2000 and NACE Rev.2;
- Type of expenditure (investments and current expenditure);
- Gross fixed capital formation;
- Intermediate consumption;;
- Final consumption.

at a national level ..

Data are reported to Eurostat in a standardised Excel format (EPREA Questionnaire) via EDAMIS.

They are published on the NSI website in the "Statistical data - Environment" section, as well as in the Infostat system. Data are used for the preparation of NSI publications - Statistical Yearbook, Statistical Reference book, brochure "Bulgaria", specialised electronic publication "Environment", as well as for providing information upon users' request.