REPUBLIC OF BULGARIA
National Statistical Institute

"AIR EMISSIONS" 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 main purpose of the statistical survey is to provide information to all stakeholders and the public about the emissions of greenhouse gases causing climate change and the emissions of air pollutants harmful to human health, the environment and biodiversity, in accordance with the requirements of Regulation (EU) No. 691/2011 on European environmental economic accounts.

ESSENCE
According to Art. 2, item 1 of the Regulation (EU) No. 691/2011 'air emission' means a physical flow of gaseous materials or particulate matter from the national economy (production or consumption processes) into the atmosphere (an integral part of the environmental system). In this sense, the system boundary is the boundary line between the national economy (as part of the economic system) and the atmosphere (as part of the environmental system).
Air emissions accounts report emissions of seven greenhouse gases and seven air pollutants (harmful substances):

- Greenhouse gases are Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Perfluorocarbons, Hydrofluorocarbons (PFCs, HFCs,) and Sulphur hexafluoride and nitrogen trifluoride (SF_6 NF_3).

Non-CO_2 greenhouse gases are reported in tonnes converted to CO_2 equivalent. The conversion is based on factors that reflect the climate impact of the respective greenhouse gas compared to CO_2.

- Air pollutants are Ammonia (NH_3), Sulphur oxides (SOx), Nitrogen oxides (NOx), Non-methane volatile hydrocarbons (NMVOC), Carbon monoxide (CO), and dust particles-Particulate matter < 10 μm (PM 10) and Particulate matter < 2,5 μm (PM 2.5). The emissions of these pollutants are calculated in tons, and those of CO_2 in thousand tons.

Air emissions accounts, as part of the environmental economic accounts, report the flows of gaseous and particulate matter from the national economy into the atmosphere in a way fully consistent with the concepts, principles and data of the System of National Accounts.
A basic principle in accounting for emissions is the principle of residency. An economic unit is

a resident unit of a country when it has a center of economic activities in the economic territory of that country for one year or more. This means that emissions from the activities of resident units of the national economy are reported, regardless of where they actually originate geographically.
Air emissions accounts are in accordance with the accounting structures and principles of the System of Environmental Economic Accounting 2012-Central Framework - SEEA CF. SEEA CF is an international standard for concepts, definitions, classifications, accounting rules and tables for the preparation of internationally comparable statistics on the environment and its relationship to the economy.

PURPOSE
The air emissions data obtained as a result of the statistical survey are used in the reporting under Regulation (EU) No. 691/2011 to the EC - DG Eurostat. They are provided to the ExEA for the needs of reporting in the relevant formats to various international institutions (CLRTAP, UNFCCC and EU), in fulfillment of the country's obligations, according to signed agreements/contracts, directives and regulations.
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 from all economic activities, the functioning of which is related to the formation of emissions.
A statistical unit is an enterprise or a local unit which activity is related to the formation of emissions into the air.
The general population consists of active enterprises and local units, an integral part of which activity are energy production processes (covered by the consumed fuels) and processes in the production of other products (covered by the produced products, consumed raw materials etc.).
The statistical survey is comprehensive according to certain criteria with the study of a basic array. Enterprises and local units that have a significant contribution (over 90%) to the formation of emissions of harmful substances are included. Due to the large number of units which activity is related to the production of bread, wine, beer and spirits and the sale of fuels (gasoline, natural gas and LPG), an additional estimation of the data is made.

DATA SOURCES
- Statistical survey ‘Air Emission’;
- Administrative sources (MOEW, ExEA, etc.).

Information from other statistical surveys (energy statistics, business statistics, etc.) is also used to define the general population, verify the data and make estimates.

FREQUENCY OF DATA COLLECTION AND PUBLICATION
Annually.

STATISTICAL STUDY

DEFINING THE STATISTICAL POPULATION FOR THE STUDY

The statistical population consists of statistical units (enterprises and local units) included in the Statistical Business Register (SBR), which economic activity (NACE Rev.2) is generally related to:

- Production of heat and electricity;
- The production of industrial products;
- Other activities related to emissions of harmful substances into the air - extraction of minerals, storage and trade of goods/products, etc. activities/services leading to air emissions.

The population is updated annually before the start of the Campaign.

DATA COLLECTION

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 finalizing 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

Reports from all survey respondents should be collected within the Campaign. In case a 100% response rate is not achieved, the need for an estimates of the missing data is assessed and, if necessary, carried out.

STATISTICAL DATA CALCULATION

Calculation of air emissions

Air emissions are calculated using established methods in accordance with the recommendations in the currently effective guidance documents in the field - the EMEP/EEA air pollutant emission inventory guidebook (latest version) of the European Environment Agency, and others.

Emissions from each installation/facility on the territory of the country for the following harmful substances are calculated: Sulfur oxides (SOx), Nitrogen oxides (NOx), Non-methane volatile organic compounds (NMVOC), Carbon monoxide (CO), Ammonia (NH_3), Total suspended particulate matter (TSPM), Dust particles>10µm (PM10), Dust particles >2.5µm (PM2.5), Heavy metals and others.

Emissions are calculated by a method, which in the most general case is based on an equation in which the activity data (AD) are multiplied by a selected emission factor for the relevant pollutant (EF pollutant). In case that there are treatment facilities built for the relevant emission source to reduce the pollutant/s released into the air or measures are applied to limit them, a coefficient (ɳ abatement) is applied to reduce emissions (the same can be included in the selected emission factor (EF abatement/technology).

The formula for calculating emissions is as follows:

$$E_{pollutant} = AD_{\text{fuel consumption}} \times EF_{\text{pollutant/techology}} \times \eta_{\text{abatemen}}$$

$$E_{pollutant} = AD_{\text{production}} \times EF_{\text{pollutant/techology}} \times \eta_{\text{abatemen}}$$

или

$$E_{pollutant} = AD \times EF_{\text{abatement/techology}}$$

Where:

E pollutant	-	the emissions of the corresponding pollutant
AD	-	the activity data - the quantities of fuels used, output produced, raw materials or auxiliary materials, etc.
EF	-	the emission factor of the relevant pollutant

The choice of emission factors depends on the activity data, the type of installation/facility and the availability of treatment facility(s). In that:

$$EF_{\text{abatement/technology}} = (1 - \eta_{\text{abatement}}) \times EF_{\text{technology/unabatemen}}$$

Preparation of air emission accounts

For the preparation of the air emission accounts, according to Regulation (EU) No. 691/2011, data from the statistical survey, data from the National Inventories, other statistical surveys and administrative sources are used. Data on transport, agriculture, households are taken from the National Inventory of Emissions of Harmful Substances. The data on the emissions of CO_2, CH_4, N_2O (in tons) and PFCs, SF6, HFCs (in tons of CO_2 eq.) are taken from the National Inventory of Greenhouse Gases.

The data on the calculated emissions and the data from the National Inventories of Emissions of Harmful Substances and Greenhouse Gases are systematized and processed for the needs of reporting on air emissions accounts to Eurostat, in fulfillment of the requirements of Regulation No. 691/2011 and in accordance with Eurostat's Manual for air emissions accounts.
Air emissions accounts include:

- Air emissions by industries - Aggregated nomenclature A64 based on NACE Rev.2 (letter code);
- Air emissions from households (transport, heating/cooling, etc.);
- Bridging items.

Air emissions accounts are reported in the Excel format of the Air Emissions Accounts Questionnaire, available on the Eurostat website.

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 assurance is carried out in order to guarantee compliance with the requirements of the Statstics 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 the high quality of the data, their consistency with the data from the Energy Statistics on the production and consumption of energy products and with the data on industrial production (Report on the production and sales of industrial products PRODCOM) is checked
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 statistical data on air emissions are presented by:

- Economic activities and sectors for reporting to Eurostat;
- Economic activities and sectors, grouped in NFR codes for the reporting under the CLRTP and Directive (EU) 2016/2284;
- Industries/sectors – Energy (combustion processes), Industry (production processes), Transport (by types), Agriculture, Households and Waste and wastewater treatment;
- Types of pollutants;
- Territorial units – districts and municipalities.

Data are reported to Eurostat in a standardized Excel format (AEA Questionnaire) via EDAMIS. They are published on the NSI website in the “Statistics – Environment” section, as well as in

the Infostat system. The 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.