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# Air emissions accounts – Eurostat's procedure for early estimates of greenhouse gases (GHG)

Air emissions accounts (AEA) data are collected annually by Eurostat via an Excel questionnaire, validated through a series of data checks and corrections in close consultation with national statistical institutes (NSI).

In the context of AEA data validation, Eurostat has implemented procedures to gap-fill missing values from 2008 onwards, in order to produce and publish complete AEA questionnaires for each Member State in consultation with the NSIs.

For greenhouse gases (GHG) Eurostat has started to estimate AEA for one additional year beyond the mandatory reporting (i.e. 2016[1]) for EU Member States[2] and the aggregated EU. The procedure for these "early estimates" of AEA for greenhouse gases has been fully integrated into the already existing gap-filling.

This document starts with an overview of the already established gap-filling procedure followed by brief description of the early estimates.

Gap-filling already established earlier:

Eurostat produces so-called "artificial" AEA questionnaires for each EU Member State, completed with figures between 2008 and the latest mandatory year to be reported (year *n-2*). These "artificial" questionnaires are prepared from two international emission inventories which are usually available in mid-summer:

- Emission inventories for greenhouse gases reported to the UNFCCC (source: https://www.eea.europa.eu/data-and-maps/data/national-emissions-reported-to-the-unfccc-and-to-the-eu-greenhouse-gas-monitoring-mechanism-13);
- Emission inventories for air pollutants reported to LRTAP Convention – consolidated tables (source: https://www.eea.europa.eu/data-and-maps/data/national-emissions-reported-to-the-convention-on-long-range-transboundary-air-pollution-lrtap-convention-11).

The emission inventories are broken down by emission sources (classification = CRF/NFR[3]). Eurostat developed pollutant-specific correspondence matrices which cross-link CRF/NFR emission sources

[1] year *n-1*, being *n* the year of the AEA data collection

[2] Those Member States who do not already provide 2016 data

[3] Common Reporting Format (CRF) is the classification of emission sources in UNFCCC GHG emission inventories. Nomenclature For Reporting (NFR) is the classification of emission sources in emission inventories for air pollutants (LRTAP). Both classifications are aligned and widely congruent.

towards NACE-classified economic activities. The correspondence matrices are up-dated each year based on EU aggregate patterns.

The "artificial" AEA questionnaires serve only as auxiliary data for the gap-filling. The following cases of missing cells may occur:

1. No data reported by a country (one or more pollutant sheets): In this case, the "artificial questionnaire" replaces the empty worksheets of the AEA questionnaire.
2. A time series is incomplete (i.e. data for a given NACE division is not available for one or more years, but it exists for other years): Annual change rates are calculated from the "artificial questionnaires" and used to extrapolate the reported data points either backwards or forwards in time. Totals are automatically calculated as the sum of the respective sub-items.
3. A NACE division is missing for the whole time series: The share of the respective NACE division in total NACE industries is calculated for each year from the "artificial" questionnaires. These shares are then applied to the reported NACE sub-totals.

Gap-filling "early estimates" for greenhouse gases:

In the case of greenhouse gases ($CO_2$, $CH_4$, $N_2O$, HFC, PFC and $SF_6$), the year following the last year of mandatory reporting in the AEA questionnaire (year *n-1*) is in addition populated with early estimates. For the early estimates, the following data source is used:

- Proxy inventory produced by the European Environment Agency (EEA), with figures for greenhouse gases reported by Member States (to be published by the EEA in autumn).

The proxy inventory includes data for the year *n-1* (*n* being the year of the AEA data collection), classified by emission sources (CRF), as in the case of emission inventories, but with a lower level of CRF-breakdown detail. Therefore, the first calculation step consists in using the detailed figures from year *n-2* in the UNFCCC emission inventories as distribution key to produce a full-fledged "artificial UNFCCC inventory" for the year *n-1*, complete with figures at the most detailed level of the CRF classification.

The remaining steps follow the usual practice to produce the "artificial" AEA questionnaires using pollutant-specific CRF-NACE-correspondence matrices (see case 2) above).

Eurostat checks and validates the resulting gap-filled dataset. Before disseminating the gap-filled dataset including the early estimates, the respective NSI is consulted.