

Air pollution statistics - emission inventories

Statistics Explained

*Data from September 2021
Planned article update: September 2022*

This article is about emissions of air pollutants classified by technical processes. These are recorded in emission inventories for air pollutants and form the official data for international policies on transboundary air pollution.

In addition, Eurostat disseminates emissions of air pollutants classified by emitting economic activities. These are recorded in [air emissions accounts \(AEA\)](#) . Furthermore, Eurostat estimates and disseminates 'footprints' which are emissions of air pollutants classified by products that are finally demanded by households or government, or that are invested in or exported.

This article highlights the emission levels of the following most important air pollutants in the [European Union \(EU\)](#) : sulphur oxides (SO_x), nitrogen oxides (NO_x), ammonia (NH₃), non-methane volatile organic compounds (NMVOC) and fine particulate matter (PM_{2.5}). However, [greenhouse gas](#) emissions are not analysed here, but in the article [Greenhouse gas emission statistics](#) .

General overview

Air pollution harms human health and the environment. Nitrogen dioxide and particulate matter pollution pose serious health risks while Europe's sensitive ecosystem areas are affected by acid deposition of excess sulphur and nitrogen compounds (SO_x, NO_x, NH₃).

Air pollutants are emitted from human activities, mainly the combustion of fuels. Thanks to a wide range of environmental policy measures, emissions of air pollutants in Europe decreased significantly over the last 30 years.

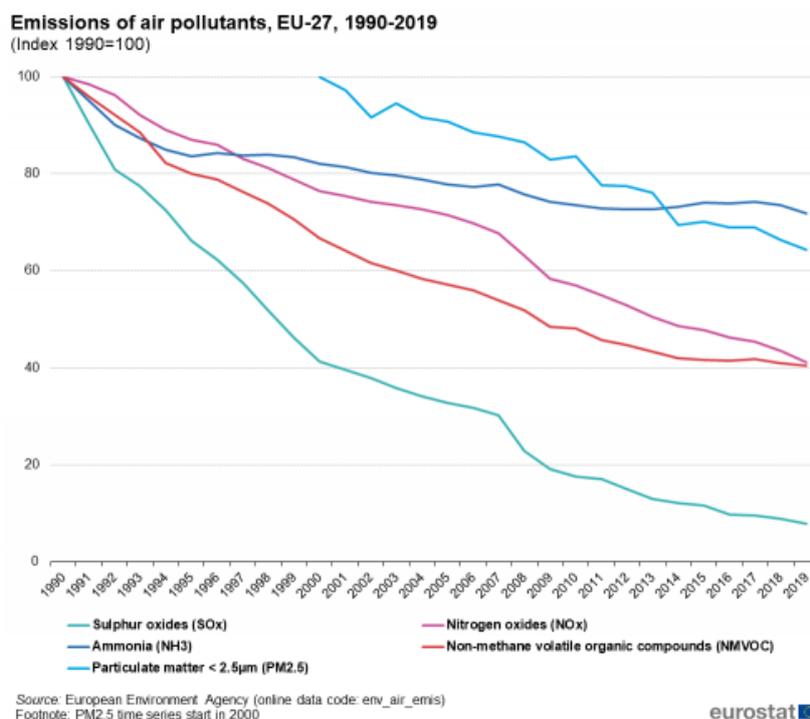


Figure 1: Emissions of air pollutants, EU, 1990-2019 (Index 1990=100), Source: EEA, also available at Eurostat (env_air_emis)

For the last 30 years (1990 to 2019) the EU recorded reductions in emissions of all air pollutants considered in this article (see Figure 1). The biggest fall was reported for sulphur oxides (SOx) which decreased by 92 %, followed by non-methane volatile organic compounds (NMVOC) and nitrous oxides (NOx), which declined roughly by 60 %. Emissions of fine particulate matter (PM2.5) decreased by more than a third since the year 2000. The smallest decrease was reported for ammonia (NH3) emissions (28 %).

For detailed analysis of air pollutants consult the [European Union emission inventory report 1990–2019 under the UNECE Convention on Long-range Transboundary Air Pollution \(LRTAP\)](#) (published by EEA).

Source data for tables and graphs

- [Air pollution statistics: tables and figures 2021](#)

Data sources

Data in this article are based on the data reported in national emission inventories for air pollutants under the United Nations Economic Commission for Europe (UNECE) Convention on Long-range Transboundary Air Pollution (CLRTAP) and the EU National Emission Ceilings Directive (NEC) . The principles and methodology to estimate air pollutant inventories are laid down in the [EMEP/EEA air pollutant emission inventory guidebook](#) .

Within the EU inventory system, the [European Environment Agency](#) and its [European Topic Centre on Air Pollution and Climate Change Mitigation](#) are responsible for the annual compilation of the EU inventory. Air pollutant emission inventories record the emissions of a wide range of substances from sources classified according to the Nomenclature for Reporting (NFR).

Three perspectives of emission statistics for air pollutants

Eurostat presents three perspectives of emission statistics for air pollutants:

Emissions accounts versus emission inventories

Perspective	Statistical framework	Purpose	Related data set	Related SE article
1. Emissions of air pollutants classified by economic activities	Air Emissions Accounts (AEA) by Eurostat	tailored for integrated environmental-economic analyses	env_air_aa	link
2. Emissions of air pollutants classified by technical processes	Emission inventories for air pollutants by UNECE	official international reporting framework for CLRTAP	env_air_emis	this article
3. 'footprints' = GHG emissions classified by final use of products	Modelling results published by Eurostat	one particular analytical application of AEA	env_ac_io10	not available

The main differences between air emissions accounts (AEA) and emission inventories for air pollutants are:

Note: National and EU totals differ between the two approaches, as different boundaries apply. GHG in-

Air emissions accounts – air pollutants (residence principle)	Emission inventories for air pollutants (territory principle)
Emissions are assigned to the country where the economic operator causing the emission is resident.	Emissions are assigned to the country where the emission takes place
Emissions are classified by economic activity, following the NACE classification of the system of national accounts.	Emissions are assigned to processes classified according to their technical nature (e.g. combustion in power plants, solvent use).
Emissions from international navigation and aviation are assigned to the countries where the operator of the ship/aircraft is resident, regardless of where the emission takes place.	Emissions from international navigation and aviation are assigned to the countries where the associated fuel is bunkered, irrespective of the operator's place of residence.

ventories include international aviation and maritime transport (international bunker fuels) as memorandum items, which mean that they are excluded from national totals reported. However, they are included in air emissions accounts totals. Therefore total emissions reported in GHG inventory databases can differ significantly from the total reported in air emissions accounts for countries with a large international aircraft and/or shipping fleet. AEA reconciles totals with emission inventories through so-called 'bridging items'.

Context

The European Union has set itself the goal to achieve levels of air quality that do not give rise to significant negative impacts on, and risks to, human health and the environment. Since the early 1970s, the EU has been working to improve air quality by controlling emissions of harmful substances into the atmosphere, improving fuel quality, and by integrating environmental protection requirements into the transport and energy sectors.

The Commission adopted a [Clean Air Policy Package](#) in December 2013, consisting of *A new Clean Air Programme* for Europe with new air quality objectives for the period up to 2030, a revised National Emission Ceilings Directive with stricter national emission ceilings for the six main pollutants, and a proposal for a new Directive to reduce pollution from medium-sized combustion installations. Internationally, the emissions of acidifying substances that result in acid rain are to a large extent regulated by the Gothenburg Protocol under the UNECE [Convention on long-range transboundary air pollution](#) (CLRTAP), signed in 1979.

In 2018, the European Commission adopted a Communication [A Europe that protects: Clean air for all](#) that provides national, regional and local actors with practical help to improve air quality in Europe.

Via this [website](#), you can find more information on what the European Union is doing to reduce [national air pollution emissions](#) as well as [air pollution from the main sources](#), and thus improve air quality.

Other articles

- [Air pollution statistics - air emissions accounts](#)
- [Climate change - driving forces](#)
- [Greenhouse gas emission statistics - emission inventories](#)

Tables

- [Emissions of greenhouse gases and air pollutants \(Source: EEA\)](#)

Database

- [Air emission inventories \(Source: EEA\)](#)

Dedicated section

- [Air emissions inventories \(source: EEA\)](#)

Publications

- [Energy, transport and environment indicators](#) Statistical book, 2020 edition

Legislation

- [Framework Directive 96/62/EC](#) of 27 September 1996 on ambient air quality assessment and management
- [Directive 1999/30/EC](#) of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air of 27 September 1996 on ambient air quality assessment and management
- [Directive 2001/81/EC](#) of 23 October 2001 on national emission ceilings for certain atmospheric pollutants (NEC Directive) ([Summary](#))
- [Summaries of EU legislation: National emission limits for certain air pollutants](#)
- [Directive 2002/3/EC](#) of 12 February 2002 relating to ozone in ambient air
- [Decision 2004/224/EC](#) of 20 February 2004 laying down arrangements for the submission of information on plans or programmes required under Council Directive 96/62/EC
- [Directive 2004/42/EC](#) of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC ([Summary](#))
- [Summaries of EU legislation: Emissions of volatile organic compounds in paints, varnishes and vehicle refinishing products](#)
- [Directive 2008/50/EC](#) of 21 May 2008 on ambient air quality and cleaner air for Europe ([Summary](#))
- [Summaries of EU legislation: Cleaner air for Europe](#)

External links

- [EU legislation on air quality and emissions](#)
- [European Commission - Environment - Air](#)
- [European Environment Agency - Air pollution](#)
- [National emission ceilings under Directive 2001/81/EC of the European Parliament and the Council on National Emission Ceilings for certain pollutants \(NEC Directive\)](#)
- [World Health Organization - Air pollution](#)