

## Evropski indeks kakovosti zraka - EAQI

The European Air Quality Index allows users to understand more about air quality where they live, work or travel. Displaying up-to-date information for Europe, users can gain insights into the air quality in individual countries, regions and cities.

The Index is based on concentration values for up to five key pollutants:

- particulate matter (PM<sub>10</sub>);
- fine particulate matter (PM<sub>2.5</sub>);
- nitrogen dioxide (NO<sub>2</sub>);
- ozone (O<sub>3</sub>);
- sulphur dioxide (SO<sub>2</sub>).

It reflects the potential impact of air quality on health, driven by the pollutant for which concentrations are poorest due to associated health impacts.

The index is defined hourly and it consists of two independent layers: the stations layer and the modelled layer.

The **station layer** shows information for more than 3.500 air quality monitoring stations across Europe, using a combination of Up-To-Date (UTD) data reported by EEA member countries (data is not formally verified by countries) and a forecast of the air quality level following a downscaling of the forecast provided by the Copernicus Atmospheric Monitoring Service (CAMS).

The user can filter the stations by country and by station type. Stations are classified in relation to the predominant emission sources: traffic, industry and background (where the station's main pollution source is dominated neither by traffic nor by industry). The available viewing options include all stations, traffic stations only, or non-traffic stations (i.e. industrial and background stations).

The **modelled** layer shows information for every single 1x1 km grid in Europe using a downscaling of the forecast provided by CAMS. This allows getting information also for locations without any monitoring stations nearby.

Vir: <https://airindex.eea.europa.eu/AQI/index.html>

## **Evropski indeks kakovosti zraka - EAQI**

By default, the Air Quality Index depicts the situation 3 hours ago. Additionally, users can select any hour within the past 48 hours and also view forecast values for the next 48 hours.

European Union legislation sets air quality standards for both short-term (hourly or daily) and long-term (annual) air quality levels. The Index indicates the short-term (hourly) air quality situation. It does not reflect the long-term (annual) air quality situation, which may differ significantly (information on this can be found at the [quality statistics | European Environment Agency's home page](#)).

**The air quality index is not a tool for checking compliance with air quality standards and cannot be used for this purpose.**

### **1. Methodology**

Concentration values for up to five key pollutants determine the index level that reflects air quality at each monitoring station in the station layer, or grid in the modelled layer. The index corresponds to the poorest level for any of the five pollutants, according to the table shown below.

#### **a. Stations layer**

The Index uses Up-To-Date (UTD) air quality data officially reported every hour by EEA member countries, complemented (where necessary) by modelled air quality data obtained by downscaling the forecast from the CAMS ,i.e. if there are gaps in the UTD data, it is filled with the downscaled CAMS modelling.

Circles and dots on the map represent the locations of the air quality monitoring stations. The colours reflect the air quality index category at the given hour at that specific station according to the colour coding presented in the table below.

#### **Averaging time for pollutants**

Vir: <https://airindex.eea.europa.eu/AQI/index.html>

## **Evropski indeks kakovosti zraka - EAQI**

To determine the AQI level, hourly concentrations of all five pollutants (PM<sub>2.5</sub>, PM<sub>10</sub>, NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>) are used.

### **Determining the index for traffic stations**

When determining the index for traffic stations data from all available pollutants are used. However, the station is painted in full colour only when data is available for NO<sub>2</sub> and PM (either PM<sub>2.5</sub>, PM<sub>10</sub> or both), otherwise the station is painted semi-transparent.

### **Determining the index for industrial and background stations**

Similarly, at industrial and background stations, the index is determined for all stations but only those stations with data for at least the three pollutants NO<sub>2</sub>, O<sub>3</sub> and PM (either PM<sub>2.5</sub>, PM<sub>10</sub> or both) are painted in full colour, i.e. If they don't have data for all three pollutants, the station is painted semi-transparent.

### **Stations missing data for certain pollutants**

Stations not measuring all necessary pollutants to determine an overall station index are depicted as semi-transparent grey circles, indicating that the index is not determined with the minimum range of pollutants. These include stations that do not report data for all pollutants (or for which missing data cannot be gap-filled with modelled data). However, at these stations, the index is calculated internally for each measured pollutant individually. In the event, that the individual pollutant index is poor or worse, then the index colour is used at station level painted semi-transparent.

Small grey dots indicate active stations for which no data have been reported to allow the index to be determined. This might be because measurements are done manually with samplers or Up-To-Date transmission of data has not been established with EEA.

### **Missing data and gap filling**

Vir: <https://airindex.eea.europa.eu/AQI/index.html>

## Evropski indeks kakovosti zraka - EAQI

When data is not reported for a given hour, values are approximated, or 'gap-filled' using a downscaling of CAMS modelled air quality data. In such cases, it is marked with an asterisk in the pollutant timeline of the “Show details” view.

The method used for gap-filling depends on the pollutant.

- For NO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> a so called Difference method is used.
- For O<sub>3</sub> a Multiplicative method is used.
- No gap filling is performed for SO<sub>2</sub>

Difference method: The value is approximated by taking the downscaled CAMS modelled value and adding or subtracting a correction difference. This correction is the average difference between previously measured values and the downscaled CAMS modelled value for the same hour for at least three of the four previous days.

Multiplicative method: The value is approximated by taking the downscaled CAMS modelled value, and applying a correction factor. This correction is the average ratio between the previously measured values and the downscaled CAMS modelled values for the same hour for at least three of the four previous days.

In cases where there are no measured values for the same hour over three of the four previous days, the AQI for the given pollutant is not determined.

## Forecast index

Forecast values for the following 48 hours are shown as transparent circles. Circles are coloured as grey if the minimum number of required pollutants, depending on the type of station, could not be forecasted and the forecast index is good, fair or moderate.

To calculate the forecast values for the following 48 hours, CAMS modelled air quality data are downscaled and corrected using the gap-filling methods described above. No forecast values are provided for SO<sub>2</sub>.

Vir: <https://airindex.eea.europa.eu/AQI/index.html>

### b. Model layer

In this case there are no missing values, since a model is used and it provides results for every single 1x1 km grid in the covered territory. The downscaled CAMS model is used for every hour, and the previous 48 hours together with the forecasted next 48 hours are presented.

## 2. Bands of concentrations and index levels

The AQI bands that determine the category thresholds are linked to health impacts, specifically to the risk factor of mortality due to short-term exposure.

The first two bands (Good and Fair) are set based on the World Health Organization Air Quality Guidelines (AQG, published by WHO in 2021) on long-term and short-term exposure. For  $\text{SO}_2$ , that does not have a long-term AQG level defined, the annual limit value in the revised Ambient Air Quality Directive (EU 2024/2881) was used instead.

The higher pollution bands (Moderate, Poor, Very Poor, Extremely Poor) were defined first for  $\text{PM}_{2.5}$  considering the WHO interim targets and then for the rest of pollutants by estimating equivalent health risks to those for  $\text{PM}_{2.5}$ .

The Very Poor category for  $\text{O}_3$  was adjusted to align with the EU information threshold, ensuring better public communication.

Other pollutant bands were rounded to match EU alert and information levels.

## Evropski indeks kakovosti zraka - EAQI

| Pollutant                                                   | Index level<br>(based on pollutant concentrations in $\mu\text{g}/\text{m}^3$ ) |        |          |         |           |                |
|-------------------------------------------------------------|---------------------------------------------------------------------------------|--------|----------|---------|-----------|----------------|
|                                                             | Good                                                                            | Fair   | Moderate | Poor    | Very poor | Extremely poor |
| Particles less than 2.5 $\mu\text{m}$ ( $\text{PM}_{2.5}$ ) | 0-5                                                                             | 6-15   | 16-50    | 51-90   | 91-140    | >140           |
| Particles less than 10 $\mu\text{m}$ ( $\text{PM}_{10}$ )   | 0-15                                                                            | 16-45  | 46-120   | 121-195 | 196-270   | >270           |
| Ozone ( $\text{O}_3$ )                                      | 0-60                                                                            | 61-100 | 101-120  | 121-160 | 161-180   | >180           |
| Nitrogen dioxide ( $\text{NO}_2$ )                          | 0-10                                                                            | 11-25  | 26-60    | 61-100  | 101-150   | >150           |
| Sulphur dioxide ( $\text{SO}_2$ )                           | 0-20                                                                            | 21-40  | 41-125   | 126-190 | 191-275   | >275           |

### 3. Health messages

The index bands are complemented by health-related messages that provide recommendations for both the general population and sensitive populations. The latter includes both adults and children with respiratory problems and adults with heart conditions.

| AQ index | General population                                            | Sensitive populations                                                     |
|----------|---------------------------------------------------------------|---------------------------------------------------------------------------|
| Good     | The air quality is good. Enjoy your usual outdoor activities. | The air quality is good. Enjoy your usual outdoor activities.             |
| Fair     | Enjoy your usual outdoor activities                           | Enjoy your usual outdoor activities                                       |
| Moderate | Enjoy your usual outdoor activities                           | Consider reducing intense outdoor activities, if you experience symptoms. |

Vir: <https://airindex.eea.europa.eu/AQI/index.html>

## Evropski indeks kakovosti zraka - EAQI

| AQ index       | General population                                                                                                  | Sensitive populations                                                                                |
|----------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Poor           | Consider reducing intense activities outdoors, if you experience symptoms such as sore eyes, a cough or sore throat | Consider reducing physical activities, particularly outdoors, especially if you experience symptoms. |
| Very poor      | Consider reducing intense activities outdoors, if you experience symptoms such as sore eyes, a cough or sore throat | Reduce physical activities, particularly outdoors, especially if you experience symptoms.            |
| Extremely poor | Reduce physical activities outdoors.                                                                                | Avoid physical activities outdoors.                                                                  |

### 4. Additional information

#### a. Station layer

When clicking on a station , a pop-up window appears with the following additional information:

1. The name of the station and the air quality index at that station and hour.
2. The Index level at the given station.
3. A "Show details" option, with a summary of the station information; the air quality index and the associated health advice for the general population and sensitive populations; links to information on air pollution for the country where the station is located and to the webpage of the administration in charge of reporting the concentrations for that station; and two graphs, a pie- chart and a horizontal pie-chart.

The values indicated when hovering over the horizontal pie -chart show the hourly AQ Index, the hourly concentrations for all pollutants measured at the station or gap-filled over the last 7 days. An asterisk next to a value indicates that the value has been gap-filled.

Vir: <https://airindex.eea.europa.eu/AQI/index.html>

## Evropski indeks kakovosti zraka - EAQI

The pie -chart indicates the number of days that fell under each Index band over the past 365 days, with the highest hourly index level recorded on a given day determining the daily index classification.

4. A “View station location” option, that provides the location of the station using © Google Maps.

### b. Modelled layer

When clicking on any point of the modelled layer, similar information to the one for stations appears for the grid to which the points belong to, although without the pie chart and the “View location” option.

## Methodology documentation and further information

The European Air Quality Index was developed jointly by the [European Commission’s Directorate General for Environment](#) and the [European Environment Agency](#) to inform citizens and public authorities about the recent air quality status across Europe. A detailed explanation of the methodology applied to infer the bands of concentrations, index levels and health messages can be found at the [ETC HE Report 2024/17: EEA’s revision of the European air quality index bands](#) .

The European Environment Agency publishes a range of information on air quality:

- [Air pollution web page](#)
- [Air quality live: Up-to-date air quality measurement](#)
- [Key air quality statistics for the main air pollutants: map viewer](#)
- [Air quality status report](#)
- [Air pollution country profiles](#)

Vir: <https://airindex.eea.europa.eu/AQI/index.html>