

AMBIENT AIR QUALITY DIRECTIVE

2024/2881/EU

A Summary

1. WHAT IS IT ABOUT?

The aim of the revised policy is to improve air quality in the European Union to protect citizens' health and preserve the environment. It is part of the European Green Deal and the Zero Pollution Action Plan of the European Commission. The goal is to reduce air pollution significantly by 2030 and to achieve a level of pollutant emissions by 2050 that are no longer harmful to human health, natural ecosystems, and biodiversity.

Key Points of the Directive Include:

- **The Right to Clean Air is a Fundamental Right!**
- Establishment of Limits, Target Values, Thresholds, and Long-term Goals for Various Pollutants.
- Regular Review and Adjustment of These Values Based on the Latest Scientific Findings and Recommendations of the World Health Organization (WHO).
- Implementation of Measures for Monitoring and Assessing Air Quality.
- Obligation of Member States to Develop Air Quality Plans and Measures When Limits Are Exceeded.
- Collaboration Among Member States to Combat Transboundary Air Pollution.

2. WHO DOES IT AFFECT?

The stakeholders of the air quality and clean air directive in Europe include various actors directly or indirectly affected by its implementation and regulations.

1. Member States and their Administrations

- National ministries (e.g., environmental ministries)
- Regional and local authorities
- Cities and municipalities
- National environmental agencies

2. European Institutions

3. Scientific Community

4. Industry and Business

- Companies in sectors such as energy, transportation, industry, and agriculture
- Trade associations and industry chambers
- Small and medium-sized enterprises (SMEs)

5. Non-Governmental Organizations (NGOs)

- Environmental organizations
- Health organizations
- Citizen initiatives and activist groups

6. Public and Citizens

- All Residents in the EU
- General population, particularly vulnerable and sensitive groups (e.g., children, elderly, people with pre-existing conditions)

7. Health Facilities and Professionals

- Hospitals and clinics
- Doctors and healthcare providers
- Public health authorities

8. Media and Communication Channels

9. International Partners

The directive highlights the importance of cooperation among Member States and international organizations, such as the WHO and UNECE, to address transboundary air pollution and ensure collective efforts in improving air quality across Europe.

3. WHAT DOES THE DIRECTIVE CONTAIN?

The new EU air quality directive introduces stricter measures and regulations aimed at improving air quality in Member States and protecting public health.

Setting Air Quality Standards: The directive establishes stricter pollutant limits, including for particulate matter (PM₁₀, PM_{2.5}), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), benzo(a)-pyrene (BP), benzene, carbon monoxide (CO), and heavy metals such as lead, arsenic, cadmium, and nickel. Additionally, ultrafine particles (UFP) black carbon (BC) and ammonia have been introduced as mandatory pollutants for monitoring at supersites. It sets target values, average exposure reduction obligations, critical values, information and alert thresholds, and long-term goals.

Air Quality Monitoring: In addition to existing measurement sites, Member States must set up and operate "Monitoring Supersites" as well as sampling points in urban and rural areas to provide more comprehensive air quality data. The directive mandates regular reviews and adjustments of monitoring methods as technology advances.

Assessment and Reporting: Member States are required to assess air quality, generate reports, and submit data to the Commission, ensuring full public accessibility. The directive introduces real-time data availability and establishes a standardized EU-wide Air Quality Index to provide clear, comparable information. The first mandatory review of air quality standards must take place by 2030.

Measures to Improve Air Quality: If limit values are exceeded, air quality plans must be developed, specifying the pollutants and the reduction measures required. Short-term action plans have to be implemented when alert

thresholds are exceeded. The directive also supports long-term air pollution reduction strategies, such as the Zero Pollution Action Plan and the European Green Deal.

Air Quality Roadmaps: In addition, if air quality limit values are exceeded after January 1, 2026, Member States must develop an Air Quality Roadmap within two years (Article 19). These roadmaps outline long-term measures to ensure compliance by 2030 and beyond. They include detailed plans on emission reductions, implementation timelines, and funding sources. Roadmaps are also required for any request to postpone compliance deadlines until 2035 or 2040, as outlined in Article 18.

Cooperation and Coordination: Member States are required to collaborate on transboundary air pollution control and coordinate with international organizations like WHO, UNECE, and EMEP.

Fixed vs Indicative Measurement

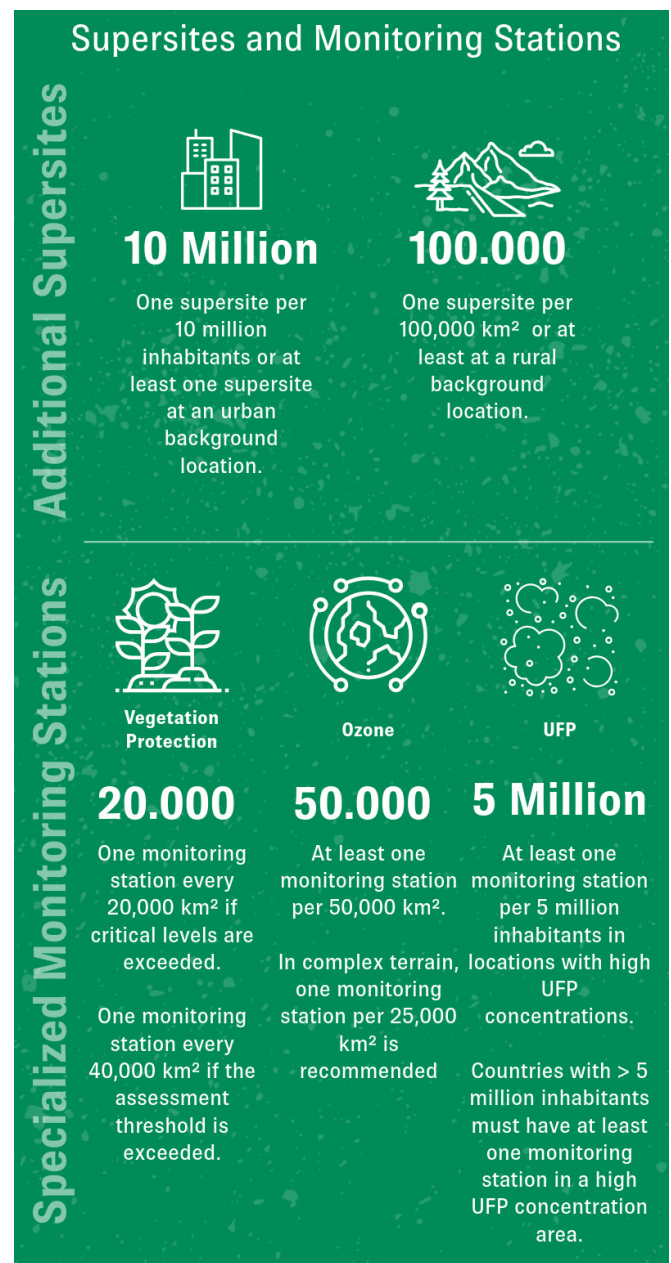
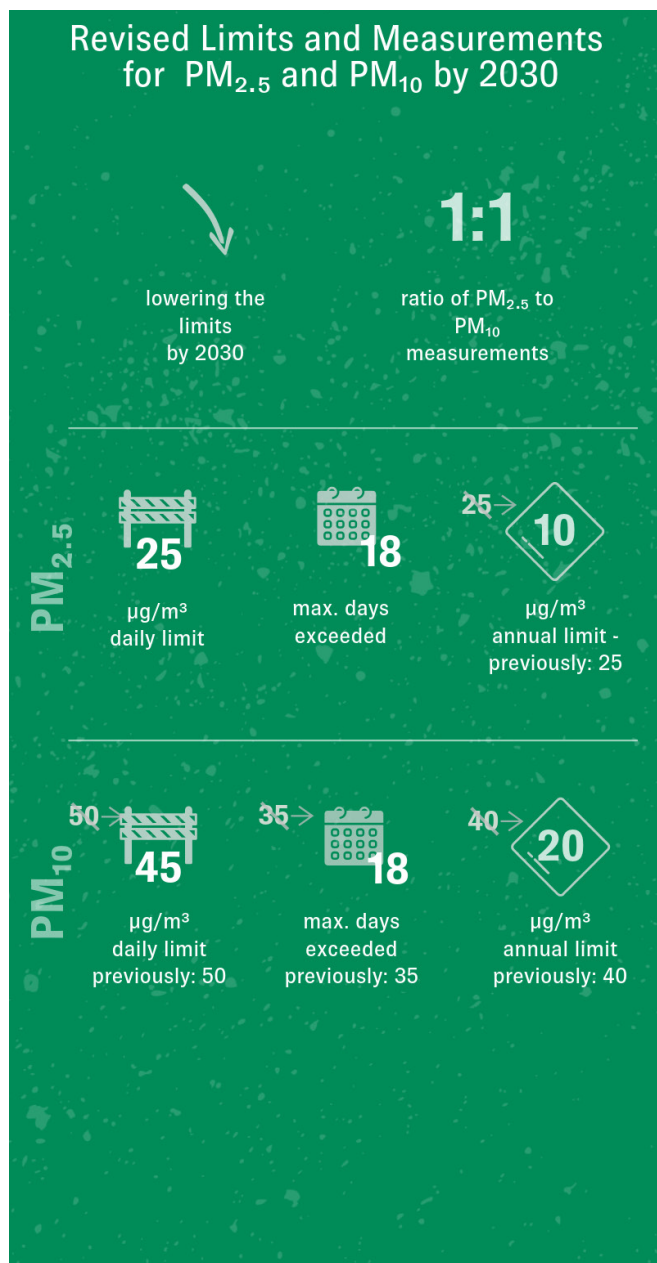
Fixed measurements are continuous and highly accurate air quality assessments conducted using standardized instruments. They are essential for regulatory compliance and long-term monitoring, providing precise data used to evaluate compliance with air quality standards and inform public health advisories.

In contrast, indicative measurements are less frequent and less precise, often using simpler instruments to provide an approximate indication of air quality levels. These are typically used for preliminary assessments, screening, or supplementary monitoring, helping to identify areas where more detailed measurements may be needed.

4. WHAT ARE THE DEFINED GOALS?

The Commission regularly reviews scientific findings on pollutants, their impacts on health and the environment, and the associated costs. Based on this review, the Commission assesses whether the current air quality standards remain suitable for achieving the objectives of the directive. The first review is scheduled by December 31, 2030. If necessary, the Commission will propose updates to the standards or include additional pollutants. (Section 10.9)

In addition to limit values, the directive introduces average exposure concentration objectives to further reduce long-term health risks. These objectives are set at 5 $\mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$ and 10 $\mu\text{g}/\text{m}^3$ for NO_2 .



POLLUTANT	AVERAGING PERIOD	LIMIT VALUE	PREVIOUS LIMIT VALUE
PM _{2.5}	1 day	25 µg/m ³	N/A
		18 times per calendar year	N/A
PM _{2.5}	Calendar year	10 µg/m ³	25 µg/m ³
PM ₁₀	1 day	45 µg/m ³	50 µg/m ³
		18 times per calendar year	35 times per calendar year
PM ₁₀	Calendar year	20 µg/m ³	40 µg/m ³
Nitrogen dioxide	1 hour	200 µg/m ³	200 µg/m ³
		3 times per calendar year	18 times per calendar year
Nitrogen dioxide	1 day	50 µg/m ³	N/A
		18 times per calendar year	N/A
Nitrogen dioxide	Calendar year	20 µg/m ³	40 µg/m ³
Sulphur dioxide	1 hour	350 µg/m ³	350 µg/m ³
		3 times per calendar year	24 times per calendar year
Sulphur dioxide	1 day	50 µg/m ³	125 µg/m ³
		18 times per calendar year	3 times per calendar year
Benzene	Calendar year	3.4 µg/m ³	5 µg/m ³
Carbon monoxide	Maximum daily 8-hour mean	10 mg/m ³	10 mg/m ³
Carbon monoxide	1 day	4 mg/m ³	N/A
		18 times per calendar year	N/A
Lead	Calendar year	0.5 µg/m ³	0.5 µg/m ³
Arsenic	Calendar year	6.0 ng/m ³	6.0 ng/m ³
Cadmium	Calendar year	5.0 ng/m ³	5.0 ng/m ³
Nickel	Calendar year	20 ng/m ³	20 ng/m ³
Benzo(a)pyrene	Calendar year	1.0 ng/m ³	1.0 ng/m ³

To ensure comprehensive and consistent air quality monitoring across Member States, the European Air Quality Directive outlines specific requirements for supersites and general monitoring stations.

General Monitoring Stations (Article 9)

In addition to existing measurement sites, each assessment zone must have a network of general monitoring stations to measure compliance with air quality standards for pollutants such as NO₂, PM₁₀, PM_{2.5}, SO₂, benzene, and CO. These stations ensure continuous observation of air quality levels in urban, suburban, and rural areas.

Supersites: Specialized Long-Term Monitoring

Supersites are specialized monitoring stations located at urban and rural background sites, combining multiple sampling points to collect long-term data on various pollutants.

That means:

- Fixed measurements at urban background Supersites for PM₁₀, PM_{2.5}, UFP, BC, NO₂, and O₃, and fixed or indicative measurements for SO₂, CO, benzo(a)pyrene and other relevant PAHs, arsenic, cadmium, lead, and nickel, benzene, and chemical composition of PM_{2.5}.
- Fixed measurements at rural background Supersites for PM₁₀, PM_{2.5}, UFP, BC, NO₂, O₃, and ammonia (NH₃), and fixed or indicative measurements for SO₂, CO, benzo(a)pyrene and other relevant PAHs, arsenic, cadmium, lead, nickel, mercury, and gaseous mercury, as well as the chemical composition of PM_{2.5}.

Minimum Number of Sampling Points

The directive sets minimum requirements for the number and location of both general monitoring stations and specialized stations, including:

- One Supersite per 10 million inhabitants or at least one in an urban background location.
- One Supersite per 100,000 km² or at least one in a rural background location.
- General monitoring stations in each assessment zone to measure PM₁₀, PM_{2.5}, NO₂, SO₂, CO, benzene, and other regulated pollutants.
- Additional monitoring stations in high pollution hotspots such as high-traffic areas and industrial zones.
- Specialized monitoring stations for vegetation protection (1 per 20,000 km² if critical levels are exceeded).
- Ozone-specific monitoring stations (at least 1 per 50,000 km², or 1 per 25,000 km² in complex terrain).
- Ultrafine Particle (UFP) monitoring stations (at least 1 per 5 million inhabitants in high-concentration areas).

These measures ensure that air quality monitoring is representative, standardized, and aligned with EU air quality objectives, helping to protect public health and the environment.

5. INFORMATION AND ACCESSIBILITY

The European Air Quality Directive outlines specific requirements for the provision of air quality information, alert thresholds, information thresholds, hourly values, and accessibility to ensure public awareness and protection. It places additional emphasis on real-time data availability and the inclusion of vulnerable groups in public health measures.

Air Quality Index

Member States are required to establish an air quality index that provides hourly updates for sulfur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), and ozone (O₃). This index must be understandable and comparable across all Member States, following WHO recommendations. It should include information on health impacts, especially for sensitive populations and vulnerable groups.

Alert Thresholds

Alert thresholds are pollutant levels that, when exceeded, require immediate public notification and protective actions.

- Sulfur dioxide (SO₂): 1-hour average of 350 µg/m³
- Nitrogen dioxide (NO₂): 1-hour average of 200 µg/m³
- PM_{2.5}: 1-day average of 50 µg/m³
- PM₁₀: 1-day average of 90 µg/m³
- Ozone (O₃): 1-hour average of 240 µg/m³

Information Thresholds

Information thresholds are pollutant levels that, when exceeded, necessitate the dissemination of information to the public.

- Sulfur dioxide (SO₂): 1-hour average of 275 µg/m³
- Nitrogen dioxide (NO₂): 1-hour average of 150 µg/m³

- PM_{2.5}: 1-day average of 50 µg/m³
- PM₁₀: 1-day average of 90 µg/m³
- Ozone (O₃): 1-hour average of 180 µg/m³

Hourly Values

Member States must provide hourly up-to-date data for SO₂, NO₂, PM₁₀, PM_{2.5}, CO, and O₃. This data should be available for all sampling points with up-to-date information and at least for the minimum number of required sampling points.

Accessibility

Information on air quality, including exceedances of limit values, target values, and alert thresholds, must be made available to the public through easily accessible media and communication channels. This includes information on the health impacts of air pollution, recommended precautions, and preventive actions to reduce pollution and exposure. Member States must ensure that this information is free of charge and presented in a coherent and comprehensible manner.

These provisions aim to ensure the public is well-informed about air quality and can take necessary actions to protect their health.

6. WHAT MUST BE IMPLEMENTED BY WHEN?

Member States must implement a series of measures within specified deadlines to improve air quality across the EU. These measures include the establishment of monitoring stations and the development of air quality plans when limits are exceeded. The Commission has to regularly review and adjust standards based on the latest scientific findings. The first review of air quality standards is scheduled for 2030, with subsequent reviews every five years. In cases where compliance is particularly challenging, Member States may apply for an extension until

2040 under strict conditions.

By December 2026, Member States must implement measures to identify and account for air pollution from natural sources. The Commission will provide technical details on how exceedances attributable to natural sources should be demonstrated and subtracted from compliance assessments (Article 16).

ACTION	DEADLINE
Establishment of Supersites and Monitoring Stations (Article 9, 10) "Monitoring Supersites" with fixed and indicative measurements, including ultrafine particles (UFP) and black carbon (BC) - At least one monitoring station per 10 million inhabitants in urban background locations and at least one station in rural background locations	With the directive coming into force in national law, which must be implemented by no later than December 11, 2026
Creation of Air Quality Plans and Road Maps When Limits Are Exceeded (Article 19) - Development and implementation of Air Quality Plans (AQP) to comply with limit values and target values immediately upon detection of exceedance - Measures to reduce emissions from various sources (e.g., transportation, industry, agriculture) - If exceedances persist after January 1, 2026, an Air Quality Roadmap (AQR) must be developed within two years	AQP: Immediately upon detection of exceedance AQR: Must be developed within two years after a persistent exceedance in 2026 or later
Regular Review (Articles 3, 7) - Regular review of scientific findings and adjustment of air quality standards - Adjustment of monitoring techniques and methods to the latest state of science and technology	By December 31, 2030, and every 5 years thereafter
Specification of Technical Details by the Commission (Articles 8, 11, 16 - Annex VI)	The Commission will define details by mid-2026
Implementation of Technical Details to Assess Natural Sources (Article 16)	By December 31, 2026
Postponement of Attainment Deadlines (Article 18)	Max. until January 1, 2040
Regular Air Quality Review (Article 7)	At least every 5 years
Reporting to the European Commission (Article 23)	Continuously, as soon as relevant data are available

7. WHAT ARE THE LEGAL CONSEQUENCES?

The new EU air quality directive brings a series of legal obligations and consequences for Member States and local authorities. These include compliance with limit values, setting up monitoring stations, reporting and documentation requirements, and creating air quality plans and short-term action plans. Sanctions and enforcement measures, as well as transparency and public participation, are key aspects of the directive. Member States are required to establish penalties for breaches of the directive and ensure the public is informed about air quality (Articles 24, 26, 27, 28, and 29).

Obligations of Member States and Local Authorities

1. Compliance with Limit Values

- Member States must ensure that limit values for pollutants like PM₁₀, PM_{2.5}, and NO₂ are not exceeded in any zone or agglomerations.
- When limit values are exceeded, Member States must create and implement air quality plans to reduce emissions and achieve compliance (Article 19).

2. Establishment of Monitoring Stations

- Member States must establish and operate monitoring stations at urban and rural background locations to continuously monitor air quality (Article 9, 10).
There must be at least one supersite per 10 million inhabitants at urban background locations and at least one in rural background locations for states with an area of more than 10,000 km².

3. Reporting and Documentation Requirements

- Member States must regularly report on air

quality and compliance with limit values to the European Commission (Article 23).

- Reports must include detailed information on the concentrations of monitored pollutants, measures taken to improve air quality, and the results of these measures.
- Responsible authorities must collect air quality data and make it accessible to the public to ensure transparency and raise awareness of air quality issues.

4. Creation of Air Quality Plans and Short-Term Action Plans

- Member States must develop and update air quality plans when limit values are exceeded. These plans must include measures to reduce emissions (Article 19).
- Short-term action plans must be created when alert thresholds are exceeded to reduce air pollution quickly and protect public health (Article 20).

Sanctions and Enforcement

1. Penalties

- Member States must establish penalties for breaches of the directive's provisions. These penalties must be effective, proportionate, and dissuasive (Article 29).
- Non-compliance with the directive can lead to Member States being sued by the European Commission before the European Court of Justice. This can result in financial penalties and the obligation to take additional measures to improve air quality.

2. Public Right to Challenge

- The directive establishes the right of the public, including non-governmental organizations, to challenge decisions related to air quality (Article 27). This includes the right to access justice and seek legal remedies in case of non-compliance by authorities.
- Citizens and organizations can take legal action if authorities fail to comply with air quality obligations. This includes the right to challenge air quality plans and demand stricter enforcement measures (Article 27).

3. Compensation for Damage to Human Health

- Individuals who suffer health damage due to unlawful air pollution exceedances have the right to seek financial compensation (Article 28).

These legal consequences aim to ensure that the directive on air quality and clean air in Europe is effectively implemented to protect citizens' health and preserve the environment.

Transparency and Public Participation

1. Access to Information

- Member States must ensure that information about air quality is easily accessible to the public. This includes providing real-time air quality data and information on measures taken to reduce emissions (Article 24).
- Data must be published on digital platforms and other suitable communication channels.

2. Public Consultation

- The public must be involved in the creation and revision of air quality plans and short-term action plans. This ensures that the interests and concerns of citizens are considered (Article 26).

8. USEFUL LINKS

- **EU Air Quality Directive 2024/2881:**
<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024L2881&qid=1738227208853>
- **WHO Air Quality Guidelines 2021:**
<https://www.who.int/publications/i/item/9789240034228>
- **Europe's Air Quality Status 2024:**
<https://www.eea.europa.eu/publications/europes-air-quality-status-2024>

Report: Europe's Air Quality Status 2024

Despite notable improvements, air quality standards in Europe are still not being met. Alarming, 96% of urban populations are still exposed to harmful PM_{2.5} levels. The numbers illustrate the exposure levels of the EU urban population to various pollutants compared to both EU standards and WHO guidelines:

- PM_{2.5}: Less than 1% above EU standards; 96% above WHO guidelines.
- PM₁₀: 9% above EU standards; 83% above WHO guidelines.
- O₃: 19% above EU standards; 94% above WHO guidelines.
- NO₂: Less than 1% above EU standards; 88% above WHO guidelines.
- BaP: 13% above EU standards; 65% above WHO guidelines.
- SO₂: Less than 1% above both EU standards and WHO guidelines.
- EU Standards* until 2030: PM_{2.5} (25µg/m³), PM₁₀ (50µg/m³), O₃ (120µg/m³), NO₂ (40µg/m³), BaP (1ng/m³), SO₂ (125µg/m³).
- WHO Guidelines until 2021: PM_{2.5} (5µg/m³), PM₁₀ (15µg/m³), O₃ (100µg/m³), NO₂ (10µg/m³), BaP (0.12ng/m³), SO₂ (40µg/m³).

**based on the Directive 2008/50/EC*

<https://www.eea.europa.eu/publications/europes-air-quality-status-2024>

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Palas GmbH

Siemensallee 84 | Building 7330 | 76187 Karlsruhe | Germany
Phone: +49 721 96213-0 | www.palas.de