EUROPEAN
COMMISSION

Brussels, 26.10.2022
COM(2022) 542 final

2022/0347 (COD)

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on ambient air quality and cleaner air for Europe

(recast)

{SEC(2022) 542 final} - {SWD(2022) 345 final} - {SWD(2022) 542 final} -
{SWD(2022) 545 final}

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE PROPOSAL

Clean air is essential to human health and sustaining the environment. Major improvements in air quality have been achieved in the European Union (EU) over the past three decades, thanks to joint efforts by the EU and national, regional and local authorities in the Member States to reduce the adverse impacts of air pollution[1]. However, around 300 000 premature deaths a year (compared with up to 1 million a year in the early 1990s) and a significant number of noncommunicable diseases such as asthma, cardiovascular problems and lung cancer, are still attributed to air pollution (and especially to particulate matter, nitrogen dioxide and ozone)[2;3]. Air pollution continues to be the number one environmental cause of early death in the EU. It disproportionally affects vulnerable groups such as children, elderly people and persons with pre-existing conditions, as well as socioeconomically disadvantaged groups[4]. There is also increasing evidence that air pollution may be associated with changes of the nervous system, such as dementia[5].

In addition, air pollution threatens the environment through acidification, eutrophication, and ozone damage, causing damage to forests, ecosystems and crops. Eutrophication from deposition of nitrogen exceeds critical loads in two thirds of ecosystem areas across the EU, with significant impact on biodiversity.[6] This pollution pressure can aggravate situations of nitrogen surplus via water pollution.

In November 2019, the Commission published its Fitness Check of the Ambient Air Quality Directives (Directives 2004/107/EC and 2008/50/EC)[7]. It concluded that the Directives have been *partially* effective in improving air quality and achieving air quality standards, but that not all their objectives have been met to date.

In December 2019, in the European Green Deal[8], the European Commission committed to further improving air quality and to aligning EU air quality standards more closely with the recommendations of the World Health Organization (WHO). The WHO recommendations were most recently revised in September 2021[9] and are subject to periodic scientific review, typically every 10 years. This objective of closer alignment with latest scientific findings was confirmed in the zero pollution action plan[10], entailing a vision for 2050 to reduce air (and water and soil) pollution to levels no longer considered harmful to health and natural ecosystems, and that respect the boundaries our planet can cope with, thus creating a toxic-

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1 See, for example: EEA (2018), Air Quality in Europe 2018 Report. The median estimate for all datasets available pointed to 445 000 premature deaths across Europe per year in 2015, compared to a situation 25 years earlier when the median value was 960 000 deaths per year in 1990.

2 As specified by the WHO, "[n]communicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behavioural factors. NCDs disproportionately affect people in low- and middle-income countries, where more than three quarters of global NCD deaths (31.4 million) occur."

3 See, for example: EEA (2021), Air Quality in Europe 2021.

4 See, for example, EEA (2018): Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe.

5 United States Environmental Protection Agency (2019 and 2022): Integrated Science Assessment for Particulate Matter; Supplement to the 2019 Integrated Science Assessment for Particulate Matter.

6 See, for example, The Second Clean Air Outlook, COM(2021) 3.

7 Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air and Directive 2008/50/EC on ambient air quality and cleaner air for Europe, as amended by Commission Directive (EU) 2015/1480.

8 COM(2019) 640.

9 WHO (2021) WHO Global Air Quality Guidelines.

10 COM (2021) 400.

free environment. In addition, 2030 targets were introduced, two of them on air: to reduce the health impacts of air pollution (premature deaths) by more than 55%, and the share of EU ecosystems where air pollution threatens biodiversity by 25%. Stricter air quality standards would also contribute to the objectives of Europe's Beating Cancer Plan.[11] The Commission also announced in the European Green Deal that it would strengthen air quality monitoring, modelling and planning.

The Russian military aggression against Ukraine, which started in February 2022, led EU leaders to agree on the need to urgently accelerate the transition to clean energy production, with a view to reducing the EU's dependence on gas and other fossil fuels imported from Russia. On 18 May 2022 an ambitious RePowerEU package of measures was adopted, aimed amongst others at assisting Member States in speeding up the deployment of renewable energy production. If swiftly implemented as set out in the Commission Communication[12], this package may have significant co-benefits from an air pollution perspective.

The Ambient Air Quality Directives are part of a comprehensive clean air policy framework built on three main pillars. The first consists of the Ambient Air Quality Directives themselves, setting quality standards for concentration levels of 12 ambient air pollutants. The second is the Directive on the reduction of national emissions of certain atmospheric pollutants (the NEC Directive), which sets out commitments per Member State to reduce the emissions of key ambient air pollutants and their precursors, acting within the EU to achieve a joint reduction in transboundary pollution[13]. To this add international efforts, notably through the UNECE Air Convention, to reducing transboundary emissions from outside the EU[14]. The third pillar consists of legislation setting emissions standards for key sources of air pollution, such as road transport vehicles, domestic heating installations and industrial installations[15].

The amount of pollution from such sources is also affected by other policies that influence key activities and sectors in areas such as transport, industry, energy and climate, and agriculture. A number of these policies are part of recent initiatives taken under the European Green Deal, such as the zero pollution action plan, the European Climate Law[16] and the Fit for 55[17] package with initiatives on energy efficiency and renewable energy, the methane strategy[18], the sustainable and smart mobility strategy[19], the related 2021 new urban mobility framework[20], the biodiversity strategy[21] and the farm to fork initiative[22]. Furthermore,

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[11] COM(2021)44. The Beating Cancer Plan confirms the need to reduce ambient air pollution, which causes, amongst others, lung cancer. The plan also includes a legislative proposal in 2022 to further reduce worker's exposure to asbestos, see COM(2022(489).

[12] COM(2022)230.

[13] See Directive 2016/2284/EU.

[14] It should be noted that air pollutant emissions from outside EU Member States also play a role in background pollution in the EU. The UNECE Air Convention can play a key role on reducing these emissions, as well as capacity building and other support provided by the EU in the context of accession processes, in particular for Western Balkans countries.

[15] Including Directives 2010/75/EU (on industrial emissions), 2015/2193/EU (on medium combustion plants), 98/70/EC (on fuel quality), 2016/802/EU (on sulphur content in liquid fuels), 2009/125/EC (on eco-design), as well as EC Regulations 443/2009 and 510/2011 (on emission standards for vehicles), Regulations (EU) 2016/427, (EU) 2016/646, and (EU) 2017/1154 (on real driving emissions), and Regulation (EU) 2016/1628 (on non-road mobile machinery).

[16] Regulation (EU) 2021/1119.

[17] COM(2021) 550.

[18] COM(2020) 663.

[19] COM(2020) 789, including a Commission commitment to launch a dedicated study in 2023, which will map and clarify which digital and technical solutions would be available to enable more effective and user-friendly urban vehicles access restriction schemes (UVARs), including low emission zones (LEZ), while respecting the principle of subsidiarity (see also COM(2021) 811).

[20] COM(2021) 811.

significant reductions of pollutant emissions from cars, vans, lorries and buses are expected to result from the adoption and implementation of the forthcoming Euro 7 proposal (cf PLAN/2020/6308).

The revision of the Ambient Air Quality Directives would merge the Directives into one, and seek to:

- align EU air quality standards more closely with WHO recommendations
- further improve the legislative framework (e.g. in relation to penalties, and public information)
- better support local authorities in achieving cleaner air through strengthening air quality monitoring, modelling and plans.

The impact assessment shows that the benefits of the proposed revision for society far outweigh the costs. The main benefits expected are related to health (including reduced mortality and morbidity, reduced healthcare expenditure, reduced absence from work due to illness and increased productivity at work) and the environment (including reduced ozone-related crop yield losses).

1.1. Consistency with other Union policies

This initiative is part of the 2022 Commission work programme and a key action in the Zero Pollution Action Plan. Like all initiatives under the European Green Deal, it aims to ensure that objectives are achieved in the most effective and least burdensome way and comply with the 'do no significant harm' principle. The proposal contributes to implementing the zero pollution ambition and the targets of the Zero Pollution Action Plan for air quality to protection health and the environment. Many European Green Deal policies and priorities are of relevance for the successful implementation of the proposal, and can benefit from the increased ambition under the proposed Directive. These include:

- The Climate Law and the Fit for 55 package with their increased climate ambition will foster uptake of low- or zero emission technologies with co-benefits for air quality (such as non-combustible renewables, energy efficiency measures, electric mobility). Proposals on increased ambition include an increased ambition of the EU emission trading system (ETS), an increased ambition of the EU's Effort Sharing Regulation, and stricter CO_2 emission performance standards for cars and vans requiring all newly registered cars and vans to be zero-emission from 2035. Stricter air quality standards under this proposal will bring co-benefits for climate in the form of reduced greenhouse gas emissions, notably CO2 emissions, from fossil fuel burning, and reduction of black carbon (BC), a short-lived climate forcer (SLCF).
- RePowerEU proposes actions to rapidly reducing Europe's dependence on Russian fossil fuels, including an overall reduction of energy consumption, diversification of energy imports, substituting fossil fuels and accelerating the transition to renewable energy in power generation, industry, buildings and transport and smart investments. Speeding up these actions can benefit air quality, too.

[21] COM(2020) 380.
[22] COM(2020) 381.

- Increased uptake of non-combustible renewable energy sources will reduce reliance on fossil fuels and hence emissions of air pollutants, improving air quality. Initiatives promoting renewable energy sources include the 2021 proposal to revise the Renewable Energy Directive (RED II)[23], which puts forward more ambitious 2030 targets, as well as the 2022 Commission Communication on RePower EU with its emphasis on frontloading investments in renewables, notably solar power and wind, and in heat pumps, all of which are beneficial also for air quality.
- Increased ambition on energy efficiency and the introduction of a binding EU energy efficiency target through the proposal on a revised Energy Efficiency Directive[24] will decrease energy needs overall, including of fossil fuels and hence reduce emissions of air pollutants, improving air quality.
- Action under the Sustainable and Smart Mobility Strategy and the related the related 2021 new urban mobility framework supporting the move towards lower-emission and public transport will bring positive co-benefits for air quality. Some actions with particular relevance for air quality include more stringent air pollutant emissions standards for combustion engine vehicles (in the forthcoming **Euro 7** proposal)[25]; the proposal for an **alternative fuels infrastructure** regulation[26]: a comprehensive network of recharging and refuelling infrastructure is needed to facilitate the increased uptake of renewable and low-carbon fuels, including e-mobility, which would bring important air quality co-benefits.; proposals for **ReFuelEU Aviation** and **FuelEU Maritime** include measures that promote cleaner fuels, with a potential to reduce air pollutant emissions, and to improve air quality near ports and airports by requiring the use of on-shore power supply or zero-emission energy at berth for specific ship types and sustainable aviation fuels in aircrafts. In turn, the Ambient Air Quality Directives trigger increased action in urban areas to move to lower emission mobility, introduction of low-emission zones, increased uptake of public transport and active mobility to attain limit values.
- Greening the Common Agricultural Policy and the 'Farm to Fork' Strategy can help to reduce ammonia emissions from agriculture, for instance through promoting ammonia reduction measures via CAP Strategic Plans or improving nutrient management.
- Stricter air quality standards under this proposal will help to protect diversity in line with the Biodiversity Strategy, while policies that improve ecosystem health, such as the proposed Nature Restoration Law, can also deliver on clean air aspects.

1.2. Legal basis

The legal basis for the EU to act on air quality lies in Articles 191 and 192 of the Treaty on the Functioning of the European Union (TFEU), on the environment. These Articles empower the EU to act to preserve, protect, and improve the quality of the environment, protect human health and promote measures at international level to deal with regional or worldwide environmental problems. The same legal basis underpins the current Ambient Air Quality Directives. Given that this is an area of shared competence between the EU and the Member States, EU action must respect the subsidiarity principle.

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[23] COM (2021) 557 final
[24] COM/2021/558 final
[25] COM (2022), European vehicle emissions standards – Euro 7 for cars, vans, lorries and buses (accessed 04.08.2022)
[26] COM(2021) 559 final

1.3. Subsidiarity and proportionality

The objectives of this initiative cannot be sufficiently achieved at Member State level alone. This is due, firstly, to the transboundary nature of air pollution: atmospheric modelling and measurements of air pollution demonstrate beyond doubt that the pollution emitted in one Member State contributes to measured pollution in other Member States[27]. Once air pollutants are emitted or formed in the atmosphere, they can be transported over thousands of kilometres. The scale of the issue at hand requires EU-wide action to ensure that all Member States take measures to reduce the risks to the population in each Member State.

Secondly, the TFEU requires policies aiming for a high level of protection, taking into account the diversity of situations across the EU[28]. The existing Directives established minimum air quality standards throughout the EU but leave the choice of measures to the Member States, so that they can adjust these measures to specific national, regional and local circumstances. This principle is maintained in the proposed Directive, which would merge the two existing Ambient Air Quality Directives into one.

Thirdly, fairness and equality must be ensured as regards the economic implications of air pollution control measures and the ambient air quality experienced by people across the EU.

1.4. Proportionality principle

The proposal complies with the proportionality principle as it

- merges two Directives, consolidating and simplifying the provisions of the existing Directives in one;
- leaves the details of implementation to the Member States who know national, regional and local circumstances and can therefore better choose the most cost-effective measures to attain air quality standards;
- delivers substantial health and economic benefits that are expected to clearly outweigh the costs of measures to be taken;
- requires more precise air quality assessment through specific monitoring and modelling requirement, which can be expected to foster more targeted and cost-effective measures to comply with air quality standards.

1.5. Choice of instruments

The proposed instrument remains a Directive, as previously. Other means would not be suitable, as the proposal is to continue setting objectives at EU level but leaving the choice of measures for compliance to the Member States, who can adjust these measures to different national, regional and local circumstances, i.e. taking into account the diversity and specificity of situations across the EU. Continuity in the choice of instrument also facilitates merging and simplifying the two existing Directives into a single instrument.

[27] See, for instance, the JRC Urban PM2.5 Atlas that analyses the sources of fine particulate matter pollution in 150 cities in the EU

[28] Articles 191.2 of the Treaty on the Functioning of the European Union (TFEU)

2. RESULTS OF EX- POST EVALUATIONS, STAKEHOLDER CONSULTATIONS AND IMPACT ASSESSMENTS

2.1. Evaluation/fitness check and related opinions of the Regulatory Scrutiny Board (RSB)

The Fitness Check on the Ambient Air Quality Directives[29] found that they had guided the setting up of representative high-quality monitoring of air quality, set clear air quality standards, and facilitated the exchange of reliable, objective, comparable information on air quality, including information for a wider public. They had been less successful in ensuring that sufficient action was taken to meet air quality standards and keep the duration of exceedances as short as possible. Nevertheless, the available evidence indicated that Ambient Air Quality Directives had contributed to a downward trend in air pollution and reduced the number and magnitude of exceedances. The conclusion, in the light of this partial delivery, was that the Ambient Air Quality Directives had been broadly fit for purpose – while at the same time pointing to scope for improvements in the existing framework to achieve good air quality across the EU. It emerged from the Fitness Check that additional guidance, or clearer requirements in the Ambient Air Quality Directives themselves, could help to make monitoring, modelling and the provisions for plans and measures more effective and efficient.

Air quality standards were found to have been instrumental in driving concentrations downward and reducing exceedance levels. Nevertheless, EU air quality standards are not fully aligned with well-established health recommendations[30], and there have been and continue to be substantial delays in taking appropriate and effective measures to meet the air quality standards.

Overall, the monitoring network was found by and large to comply with the provisions of the existing Ambient Air Quality Directives, and to ensure that reliable and representative air quality data are available. However, concerns were noted that the criteria on monitoring offer too much leeway and present some ambiguity for relevant authorities.

Following recommendations from the Regulatory Scrutiny Board, the Fitness Check provided further clarifications in several areas, including on differences between EU air quality standards and WHO recommendations, air quality trends and monitoring, effectiveness of legislation in achieving air quality standards, stakeholder feedback and public perception of air quality.

2.2. Stakeholder consultation

The stakeholder consultation aimed to collect supporting information, data, knowledge and views from a comprehensive range of stakeholders, to provide input for the different policy options for revising the Ambient Air Quality Directives, and to help assess the feasibility of implementing them.

The **open public consultation** ran for 12 weeks, as an online questionnaire with 13 introductory and 31 specific questions, hosted on the EU Survey tool. The questionnaire included issues to be covered in the impact assessment and gathered initial views on the ambition level and potential impacts of certain options for revision of the Ambient Air Quality Directives. A total of 934 responses were received, and 116 position papers were submitted. Open questions received between 11 and 406 individual responses – 124 on average. The responses came from 23 different Member States.

[29] SWD(2019)427

[30] The *WHO Air Quality Guidelines* have been revised since, in 2021.

The **targeted survey** was published on EU Survey in two parts (part 1 on policy area 1 'air quality standards' on 13 December 2021, and part 2 on policy areas 2 and 3 'governance; monitoring, modelling and air quality plans' on 13 January 2022), both with a deadline for contributions of 11 February 2022. The targeted survey sought in-depth views from organisations with an interest in or working with EU rules on air quality. Accordingly, the survey was sent out to targeted stakeholders, including relevant authorities at different levels of governance, private sector organisations, academics and civil society organisations in all EU Member States. Part 1 of the targeted stakeholder survey received in total 139 replies from 24 Member States. Part 2 of the survey received 93 replies from 22 Member States.

The **first stakeholder meeting** took place on 23 September 2021 and was attended by 315 external participants, either onsite or online, from 27 Member States. The aim of the first stakeholder meeting was to gather views on shortcomings identified in the current Ambient Air Quality Directives, as well as on the ambition level for the revised legislation.

The **second stakeholder meeting** on 4 April 2022 was attended by 257 external participants, either onsite or online, from 23 Member States. The aim of the meeting was to collect feedback from stakeholders for the completion of the impact assessment.

Targeted interviews were conducted to complement the other consultation activities, in particular with representatives of regional and national public authorities, civil society & NGOs, and academia & research. The main purpose of the interviews was to fill remaining information gaps identified from the evaluation of the targeted stakeholder survey. Consequently, the interviews focused on policy area 2, notably on the feasibility, means of implementation and impacts of the various options considered.

In addition, the impact assessment took into account: 30 **ad hoc contributions** (position papers, scientific studies and other documents) received from 25 different stakeholders; discussions at the third **EU Clean Air Forum** on 18 and 19 November 2021; feedback on the **inception impact assessment** from 63 stakeholders from 12 Member States; and the **Fit for Future Platform opinion** on the ambient air quality legislation.

Furthermore, the report on the final outcome of the **Conference on the Future of Europe** showed that citizens demand action to reduce air pollution[31].

2.3. Use of expertise

The following areas of expertise have been used in developing this proposal: (1) analysis of links between air pollution and human health, (2) estimation of health impacts, including monetary quantification, (4) estimation of ecosystem impacts, (5) macroeconomic modelling, and (6) air quality assessment and management expertise.

This expertise has been gathered mainly through service contracts and grant agreements, with, among others, the WHO, the European Environment Agency, the Joint Research Centre and different consultants. All reports from experts and contracts have been routinely uploaded to the internet for public distribution.

2.4. Impact assessment and opinion of the Regulatory Scrutiny Board

The impact assessment analysed 19 policy options (comprising 69 policy measures) to address shortcomings identified in the current Ambient Air Quality Directives regarding

[31] Conference on the Future of Europe (2022): Report on the final outcome, https://europa.eu/!3k9WY6

environment and health, governance and enforcement, monitoring and assessment, as well as information and communication.

Each of these policy options was assessed with regards to its environmental, social and economic consequences, its consistency with other policy priorities and its expected benefit-to-cost ratio.

The preferred policy package is set out below.

1. On air quality standards:
    a. setting clear EU air quality standards, defined as limit values for 2030, based on a political choice between policy options 'full alignment' (I-1), 'closer alignment' (I-2) and 'partial alignment' (I-3), with a limited number of temporary exceptions where these are clearly warranted;
    b. pointing to a post-2030 perspective for a full alignment with the 2021 WHO Air Quality Guidelines, whilst getting on track towards alignment also with future WHO Guidelines to achieve the zero pollution vision by the year 2050;
    c. a regular review mechanism to assure that the latest scientific understanding of air quality guides future decisions.
2. On governance and enforcement
    a. updating the minimum requirements for air quality plans;
    b. introducing limit values for air pollutants currently subject to target values, to enable more effective reduction of the concentrations of these pollutants;
    c. further clarifying how exceedances of air quality standards need to be resolved, how to prevent them in advance, and when to update air quality plans;
    d. further defining the type of measures that competent authorities must take to keep exceedance periods as short as possible, and expanding provisions on penalties in case of breaches of air quality standards;
    e. strengthening the obligations for Member States to cooperate when transboundary pollution causes breaches of air quality standards;
    f. improving enforceability of the Directives through new provisions on access to justice and compensation and an enhanced provision on penalties.
3. On air quality assessments
    a. Further improving, simplifying and somewhat expanding air quality monitoring and assessment, including
        i. monitoring pollutants of emerging concern;
        ii. limiting relocations of air quality sampling points to those where limit values have been respected for at least three years;
        iii. further clarifying and streamlining siting criteria for sampling points;
        vi. updating the maximum measurement uncertainties allowed in line with the stricter air quality standards proposed.
    b. making better use of air quality modelling
        i. to detect breaches of air quality standards, inform air quality plans and the placement of sampling points;

ii. Improving the quality and comparability of air quality modelling.

4. On public information about air quality

    a. Hourly reporting of all available up-to-date air quality measurements for key pollutants, and making the information accessible to citizens with an air quality index;

    b. Informing the public about possible health effects and recommending behaviour when air quality standards are breached.

Overall, the main benefits are expected to come in the form of reduced mortality and morbidity, reduced healthcare expenditure, reduced ozone-related crop yield losses, reduced absence from work due to illness and increased productivity at work.

The policy options regarding different levels of alignment with the WHO Air Quality Guidelines have environmental, economic, social and health implications. All three of these options, i.e. 'full alignment' (I-1), 'closer alignment' (I-2) and 'partial alignment' (I-3), would render significant health and environment benefits – albeit to varying degrees. However, for all three policy options, the impact assessment shows that **benefits for society far outweigh the costs**.

The annual costs and benefits have been calculated for 2030 as a central estimate, since this is the year in which the majority of new air quality standards would need to be achieved for the first time. **Mitigation costs** would already arise in preceding years to ensure the new standards were met in 2030, but after 2030 they are likely to decrease as one-off investments necessary to achieve the targets will have been made already.

Policy option I-3 ('partial alignment' with the 2021 WHO Air Quality Guidelines by 2030) has the highest benefit-to-cost ratio (between 10:1 and 28:1). Most air quality sampling points in the EU might be expected to meet the corresponding air quality standards with little additional effort. Under the central estimate, the net benefits amount to more than EUR 29 billion, compared to corresponding mitigation measure costs of EUR 3.3 billion in 2030.

For policy option I-2 ('closer alignment' with the 2021 WHO Air Quality Guidelines by 2030) the benefit-to-cost ratio is expected to be slightly lower (between 7.5:1 and 21:1) Some 6% of sampling points would not be expected to meet the corresponding air quality standards without additional effort at local level (or may need time extensions or exceptions). Under the central estimate, the net benefits amount to more than 36 billion EUR, i.e. 25% more than policy option I-3. The corresponding total mitigation measures and related administrative costs are estimates at EUR 5.7 billion in 2030.

Under policy option I-1 ('full alignment' with the 2021 WHO Air Quality Guidelines by 2030) the benefit-to-cost ratio also remains significantly positive (between 6:1 and 18:1). However, 71% of sampling points would not be expected to meet the corresponding air quality standards without additional effort at local level (and in many of these instances would not be able to meet these standards at all with technical feasible reductions only). Under the central estimate, the net benefits amount to more than EUR 38 billion, i.e. 5% more than policy option I-2. The corresponding mitigation costs are estimated at EUR 7 billion in 2030.

Administrative costs are in an estimated range of EUR 75 million to EUR 106 million a year in 2030. This includes the cost of drawing up air quality plans, of air quality assessments and additional sampling points. In particular, the cost of drawing up air quality plans is expected to decrease over time, as they resolve air quality exceedances and make themselves redundant. Similarly, air quality assessment regime requirements become less stringent as air quality improves, with an expected decrease in costs related to air quality monitoring –

however, the above estimates, including one-off investment, have been annualised in the calculations. Note all these costs are borne by **public authorities**.

It is important to note that the Ambient Air Quality Directives **impose no direct administrative costs on consumers and businesses**. The potential costs for them stem mainly from measures taken by Member State authorities to achieve the air quality standards set in the Directives. These are part of the overall mitigation/adjustment costs mentioned above.

The proposed merging of the current Ambient Air Quality Directives, 2008/50/EC and 2004/107/EC, into a single Directive is expected to reduce the administrative burden for public authorities, in particular relevant authorities in the Member States, by simplifying rules, enhancing consistency and clarity, and making implementation more efficient.

The impact assessment also checked **consistency with climate policy**, in particular the European Climate Law. Given the many common sources of greenhouse gas and pollutant emissions, the proposed revision of EU air quality standards will support climate targets, as measures to achieve clean air will lead to greenhouse gas emission reductions as well.

The assessed impacts of the proposal on air quality is also coherent with the **zero pollution action plan**, notably its 2030 target to reduce by more than 55% the health impacts (premature deaths) of air pollution, and, the 2050 vision of the Action Plan to reduce air, water and soil pollution to levels no longer considered harmful to health. There are also important synergies with policies that address pollutant emissions at source and that are part of the Action Plan, too. This concerns, for instance, the recent proposal for revising the Industrial Emissions Directive and the forthcoming proposal for Euro 7 emission standards for road vehicles, which will support the achievement of stricter air quality standards.

Following the opinion of the **Regulatory Scrutiny Board**, the impact assessment was enhanced with additional analysis and clarifications on (1) the interaction of the proposal with other initiatives such as the impact of the proposed revision of the Industrial Emissions Directive, (2) the different parameters analysed for different policy options, including their respective feasibility, and (3) the reasons for problems identified with the implementation of the current Ambient Air Quality Directives.

In parallel to the impact assessment undertaken for this proposal, a wider analysis of the clean air context and its future prospects has been carried out and will be published as a regular Clean Air Outlook report[32] and as part of the Zero Pollution Monitoring and Outlook report planned for the end of 2022. The Third Clean Air Outlook will complement the analysis undertaken for the impact assessment for revision of the Directives, shedding light on additional elements such as: the regional impact of the measures proposed in the REPowerEU package on clean air; the positive prospect of achieving the zero pollution 2030 targets under the preferred policy package for revision of the Directives; and the effect of including non-technological (e.g. dietary) measures on clean air projections for 2030. These impacts are in addition to possible greater long-term positive impacts.

2.5. Regulatory fitness and simplification (REFIT)

In light of its better regulation agenda (and REFIT programme), the Commission is proposing to merge Directive 2008/50/EC and Directive 2004/107/EC into one Directive regulating all relevant air pollutants.

[32] Previous editions of the Clean Air Outlook are available at https://europa.eu/!Q7XXWT.

When Directive 2008/50/EC was adopted, it replaced a number of legislative acts: Council Directive 96/62/EC on ambient air quality assessment and management, Council Directive 99/30/EC on limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air, Directive 2000/69/EC on limit values for benzene and carbon monoxide in ambient air, Directive 2002/3/EC on ozone in ambient air and Council Decision 97/101/EC establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States. They were merged into a single Directive in the interest of clarity, simplification and administrative efficiency. At the time, the European Parliament and the Council also stipulated that consideration should be given to merging Directive 2004/107/EC with Directive 2008/50/EC, once sufficient experience had been gained in relation to the implementation of Directive 2004/107/EC.

After more than a decade of implementing Directive 2008/50/EC and Directive 2004/107/EC in parallel, the revision of the Ambient Air Quality Directives provides an opportunity to incorporate the latest scientific knowledge and experience with implementation by merging them into a single Directive. This will consolidate air quality legislation, while simplifying rules applying to relevant authorities, enhancing overall consistency and clarity, and thus making implementation more efficient.

The proposal also streamlines and simplifies a number of provisions, notably in relation to air quality monitoring of different air pollutants, types of air quality standards for these pollutants, and the requirements that result from them, such as the development of air quality plans.

The suggestions by the Fit for Future Platform's 12 November 2021 opinion on "Ambient air quality legislation"[33] was considered throughout the impact assessment, including for instance recommendations related to air quality standards, implementation, monitoring, merging the existing directives into one, coherence with related policies.

2.6. Fundamental rights

The proposed directive respects fundamental rights and observes the principles recognised in particular by the EU Charter of Fundamental Rights. This proposal sets out to avoid, prevent and reduce harmful effects on human health and the environment from air pollution, in line with Article 191(1) of the TFEU. It thus seeks to integrate into EU policies a high level of environmental protection and improvement in the quality of the environment in accordance with the principle of sustainable development laid down in Article 37 of the EU Charter of Fundamental Rights. It also puts into concrete terms the obligation to protect the right to life and to the integrity of the person laid down in Articles 2 and 3 of the Charter.

Further, it contributes to the right to an effective remedy before a tribunal as laid down in Article 47 of the Charter, in relation to the protection of human health, through detailed provisions on access to justice, compensation and penalties.

3. BUDGETARY IMPLICATIONS

The financial statement related to the budgetary implications and the human and administrative resources required for this proposal are integrated in the legislative financial

[33] COM (2022), Fit for Future Platform Opinion reference: 2021/SBGR1/04

statement for the zero pollution package which is presented as part of the proposal for revision of the lists of pollutants affecting surface and groundwaters.

The proposal will have budgetary implications for the Commission, the Joint Research Centre (JRC) and the European Environment Agency (EEA) in terms of human and administrative resources required.

The Commission's implementation and enforcement workload will slightly increase as a result of listing new standards and more substances to be monitored, and the need to review and update existing guidance and implementing decisions, as well as draft new guidance documents.

The Commission will furthermore need increased support from the JRC to strengthen air quality monitoring and modelling implementation. Specifically, this will involve drafting guidance, chairing two key expert networks, and drawing up standards relating to air quality monitoring and modelling in collaboration with the European Committee for Standardization (CEN). This scientific support would be obtained through the launch of administrative arrangements.

The EEA will have an increased workload as a result of: the need to expand infrastructure and support continuous reporting, which would be extended to include air pollutants of emerging concern as well as average exposure reduction obligations covering pollutants $PM_{2.5}$ and NO_2; the need to expand reporting infrastructure for up-to-date information from additional sampling points, modelling data and air quality plans; the need to increase support for sound assessments of air quality data reported; and the need to strengthen the links between the analysis and support for policies on air pollution, climate change, human and ecosystem health. This will require one new additional full-time-equivalent staff and two redeployments, on top of the current team of EEA colleagues already supporting EU clean air policy.

4. OTHER ELEMENTS

The current framework established under the Ambient Air Quality Directives already offers high-quality representative monitoring of air quality, as demonstrated in the Fitness Check for the Directives. Across the EU, Member States have established an air quality monitoring network with some 16 000 sampling points for specific pollutants (many of which are grouped together at more than 4 000 monitoring stations), with sampling based on common criteria defined by the Directives. Overall, the monitoring network largely complies with the Directives and ensures that reliable and representative air quality data are available. The monitoring framework will be further improved by this proposal, as explained in more detail below.

The existing provisions on reporting set out in Commission Decision 2011/850 guided the development of an effective and efficient digital e-reporting system, hosted by the EEA[34]. In addition, this proposal includes monitoring of pollutants of emerging concern. This will make it possible to observe several air pollutants for which no harmonised EU-wide air quality monitoring yet exists.

Improvements to air quality monitoring, modelling and assessment regimes are also part of this proposal. They will provide additional comparable and objective information making it possible to regularly monitor and evaluate the development of air quality in the EU. Along with more precise requirements for information to be included in air quality plans, as

[34] See also fitness check on monitoring and reporting in environmental policy, SWD(2017) 230 final.

provided for in this proposal, this will enable the effectiveness of specific (often local) air quality measures to be kept under constant review. Clearer specific requirements on public information will make it easier and faster for the public to access the outcomes of monitoring and evaluation of air quality data and related policy action.

All this will usefully inform future evaluations of a revised Ambient Air Quality Directive.

5. DETAILED EXPLANATION OF THE SPECIFIC PROVISIONS OF THE PROPOSAL:

Amendments made through the proposal to **merge the current Ambient Air Quality Directives** (2008/50/EC and 2004/107/EC) aim to consolidate and simplify the legislation.

The following explanations focus on changes compared to the current Directives. The numbering of articles cited corresponds to the proposal.

Article 1 introduces the 2050 zero pollution objective for air quality to ensure that, by 2050, air quality is so improved that pollution is no longer considered harmful to human health and the environment.

Article 3 provides for a regular review of scientific evidence to check whether the air quality standards in force are still sufficient to protect human health and the environment, and whether additional air pollutants should be regulated. The review will inform the development of plans for alignment with the WHO Air Quality Guidelines by 2050 based on a regular review mechanism to take into account the latest scientific understanding.

Article 4 include updates and adds new definitions of elements which are changed or added to the Directive.

Article 5 requires that Member States ensure the accuracy of model applications, with a view to enabling increased use of modelling for air quality assessment, and better use of the modelling.

Article 7 simplifies the rules for assessment thresholds. The thresholds inform which air quality assessment techniques should apply at different levels of pollution. The proposal replaces the current lower and upper threshold with a single assessment threshold per pollutant.

Article 8 ensures that ambient air quality must be monitored using fixed sampling points wherever air pollution levels exceed WHO recommendations. When limit values or the ozone target value of this Directive are exceeded, air quality must also be assessed with modelling applications. Modelling will also help to detect possible additional locations where limit values or the ozone target value are exceeded. This aims to make use of the advances in modelling applications to guide effective, targeted and cost-efficient air quality measures with a view to ending breaches of air quality standards as soon as possible.

Article 9 updates and clarifies rules for the number and location of sampling points, including stricter rules for relocating sampling points. The revised rules also bring together and simplify sampling point requirements for different air pollutants and air quality standards, currently spread out across the Directives.

Article 10 introduces monitoring supersites and regulates their number and location. These monitoring supersites combine multiple sampling points to gather long-term data on air pollutants covered by this Directive, as well as on air pollutants of emerging concern and other relevant metrics. Combining multiple sampling points in a supersite instead of placing

them separately may in some instances save costs. Introducing additional sampling points for unregulated air pollutants of emerging concern, such as ultrafine particles (UFP), black carbon (BC), ammonia (NH_3) or the oxidative potential of particulate matter, will support scientific understanding of their effects on health and the environment. Where applicable, Member States can set up common monitoring supersites, which can reduce costs.

Article 11 clarifies data quality objectives for air quality measurement and introduces quality objectives for modelling. A new requirement is added that requires all data to be reported and to be used for compliance assessment purposes, even if they do not meet the data quality objectives.

Provisions on assessing ozone are integrated with provisions on assessing other pollutants to simplify and streamline the provisions.

Article 12 brings together existing requirements on keeping air pollutant levels below limit values and introduces new requirements for average exposure concentrations.

Article 13 aligns EU air quality standards more closely with 2021 WHO recommendations, taking into account feasibility and cost-effectiveness analysed in the impact assessment accompanying this proposal. In addition, limit values are introduced for all air pollutants currently subject to target values, except for ozone (O_3). Experience with the current Directives shows that this will increase effectiveness in bringing down air pollutant concentrations. Ozone is exempted from this change due to the complex characteristics of its formation in the atmosphere which complicate the task of assessing the feasibility of complying with strict limit values. The revised limit and target values will enter into force in 2030, balancing the need for swift improvement with the need to ensure sufficient lead-time and for coordination with key related policies that will bear results in 2030, such as the Fit for 55 package of climate change mitigation policies. To put the EU on a trajectory that will enable it to realise the zero pollution vision for air in 2050, a new provision is introduced requiring a reduction in public's average exposure to fine particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2) at regional level (NUTS 1 territorial units), towards the levels recommended by the WHO. This adds to the obligation to meet limit and target values, applicable in air quality zones. To inform clean air policy at EU level, Member States are required to notify the Commission swiftly if they introduce more stringent air quality standards than the EU standards.

Article 14 is shortened, as sampling point requirements are the same as those under Article 7.

The content of several articles (former Articles 15-18 of Directive 2008/50/EC) on air quality standards and related requirements for fine particulate matter ($PM_{2.5}$) and ozone (O_3) is integrated with standards for other pollutants in Articles 12, 13 and 23, and requirements on sampling points are integrated into Article 7.

Article 15 introduces alert thresholds for short-term measures on peak pollution from particulate matter (PM_{10} and $PM_{2.5}$), in addition to the existing alert thresholds for nitrogen dioxide (NO_2) and sulphur dioxide (SO_2), given the significant health impacts of particulate matter pollution.

Article 16 extends the rules on deducting natural source contributions to exceedances of air quality standards to cover exceedances of average exposure reduction obligations. Air pollution from natural sources such as Saharan dust cannot be influenced by air quality management. This is why Articles 19 and 20 ensure that air quality exceedances resulting from these sources will not count as non-compliance with air quality standards including average exposure reduction obligations, and not require air quality plans.

Article 17 on deduction of winter-sanding and winter-salting is extended to include fine particulate matter ($PM_{2.5}$). Winter-sanding and winter-salting are important for road safety, even though resuspension of particles from these measures can also contribute to air pollution with particulate matter of different sizes. Air quality exceedances resulting from these sources only will not result in a requirement to establish air quality plans under Article 19.

Article 18 on postponing deadlines to attain limit values for particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2) lays down additional prerequisites for postponement, in order to increase the efficiency of air quality measures taken towards respecting the limit values. For example, air quality plans must outline how additional funding will be sought to achieve compliance faster, and how the public will be informed about the consequences of the postponement for human health and the environment. In addition, it will only be possible to postpone attainment of a limit value if the average exposure reduction obligation for the relevant air pollutant has been complied with for at least 3 years before the postponement starts. This is to ensure that postponement is granted only for cases of localised exceedances of limit values due to site-specific conditions, and will not be used to delay local, regional or national air quality measures, be it at local, regional or national measures.

Article 19 increases the effectiveness of air quality plans to ensure compliance with air quality standards as soon as possible. This will be achieved by (a) requiring air quality plans to be drawn up before air quality standards enter into force in cases of non-compliance prior to 2030, (b) specifying that air quality plans must aim to keep the exceedance period as short as possible, and in any case no longer than 3 years for limit values, and (c) mandating regular updates of air quality plans if they do not achieve compliance.

Air quality plans are made mandatory when limit values, the ozone target value or average exposure reduction obligations are exceeded. The plans will also be mandatory when it is anticipated that these standards will be exceeded. This will help to ensure that periods of exceedance are kept as short as possible. It will also foster synergies between managing different air pollutants, and between measures to attain different standards. For instance, measures to attain the average exposure reduction obligation for fine particulate matter ($PM_{2.5}$) will also support the attainment of the $PM_{2.5}$ limit value.

A final amendment will require that air quality plans analyse the risk of exceeding alert thresholds. This will lead to greater integration of short-term action plans – required to address alert threshold exceedances – with longer-term action plans, saving resources and improving the measures taken.

Article 20 requires Member States to demonstrate why a short-term action plan would not be effective if they decide not to adopt one despite a risk of exceeding the ozone alert threshold. The article also makes public consultation on short-term action plans mandatory to ensure all relevant information is taken into account for their design.

Article 21 further clarifies and strengthens the arrangements for cooperation between Member States to address breaches of air quality standards due to transboundary air pollution, notably requiring swift exchange of information between Member States and with the Commission.

Article 22 improves public awareness of air pollution by obliging Member States to establish an air quality index providing hourly air quality updates for the most harmful air pollutants.

Article 23 stipulates that the Commission will adopt implementing acts on reporting information about air quality data and management. These implementing acts will be brought into line with the revised Directive.

Article 27 establishes detailed provisions to ensure access to justice for those who want to challenge the implementation of this Directive, such as when an air quality plan has not been established despite exceedances of relevant air quality standards.

Article 28 aims to establish an effective right for people to be compensated where damage to their health has occurred wholly or partially as a result of a violation of rules prescribed on limit values, air quality plans, short-term action plans or in relation to transboundary pollution. People affected have the right to claim and obtain compensation for that damage. This includes the possibility for collective actions.

Article 29 is amended to clarify in more detail how Member States need to establish effective, proportionate and dissuasive penalties for those who violate the measures adopted in the Member State to implement this Directive, including dissuasive financial penalties, without prejudice to Directive 2008/99/EC on the protection of the environment through criminal law[35].

Annex I, in conjunction with Articles 13 and 15, brings together air quality standards for different pollutants, setting: (a) new limit values for the protection of human health; (b) updated ozone target values and long-term objectives; (c) new alert thresholds for particulate matter (PM_{10} and $PM_{2.5}$); and (d) average exposure reduction obligations for fine particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2) towards an average exposure concentration obligation at the level of WHO recommendations.

Annex II sets the assessment thresholds for air quality monitoring and modelling.

Annex III, in conjunction with Article 9, simplifies criteria for determining minimum numbers of sampling points for fixed measurement, and brings together these criteria for all air pollutants subject to different air quality standards (limit values, ozone target value, average exposure reduction obligations, alert thresholds and critical levels).

Annex IV brings together criteria for the location of sampling points for all air pollutants subject to different air quality standards.

Annex V updates and strengthens the data quality and uncertainty requirements for fixed and indicative air quality measurements, modelling, and objective estimation to ensure precise assessment in light of stricter air quality standards proposed and technical advances since the adoption of the existing Directives.

Annex VI updates rules for the methods that must be used for assessing the concentrations of different pollutants in ambient air, as well as for assessing the rate at which certain pollutants enter ecosystems.

Annex VII introduces monitoring of ultrafine particles (UFP) at locations where high concentrations of UFP are likely, such as at or close to airports, ports, roads, industrial sites or domestic heating. Together with the information from monitoring UFP background concentrations at monitoring supersites required by Article 10, this will help to understand the contribution of different sources to UFP concentrations. Annex VII also updates the list of volatile organic compounds (VOC) recommended for measurements that aim to improve the understanding of ozone formation and management.

[35] Directive 2008/99/EC of the European Parliament and of the Council of 19 November 2008 on the protection of the environment through criminal law; OJ L 328, 6.12.2008, p. 28-37. The Commission adopted a proposal 15/12/2021 to replace Directive 2008/99/EC: COM(2021) 851 final 'Proposal for a Directive of the European Parliament and of the Council on the protection of the environment through criminal law and replacing Directive 2008/99/EC.

Annex VIII, in conjunction with Article 19, brings together requirements for air quality plans that address exceedances of limit values, the ozone target value and average exposure reduction obligations. Streamlining these requirements will foster synergies between managing different air pollutants and attaining different air quality standards. Annex VIII also requires that air quality plans contain a more precise analysis of the expected effects of air quality measures. This will help make air quality plans more effective.

Annex IX enhances the air quality information to be provided to the public, including obligatory hourly updates for fixed measurements of key air pollutants, as well as up-to-date modelling results where those are available.

↓ 2008/50 (adapted)

2022/0347 (COD)

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on ambient air quality and cleaner air for Europe

(recast)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty ⌦ on the functioning of the European Union ⌫ ~~establishing the European Community~~, and in particular Article ⌦ 192 ⌫ ~~175~~ thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee[36],

Having regard to the opinion of the Committee of the Regions[37],

Acting in accordance with the ordinary legislative procedure,

Whereas:

⇩ new

(1) Directive No 2004/107/EC of the European Parliament and of the Council[38] and Directive 2008/50/EC of the European Parliament and of the Council[39] have been substantially amended. Since further amendments are to be made, those Directives should be recast in the interest of clarity.

(2) In December 2019, the European Commission set out in its Communication 'The European Green Deal'[40] an ambitious roadmap to transform the Union into a fair and prosperous society, with a modern, resource-efficient and competitive economy, aiming to protect, conserve and enhance the Union's natural capital, and to protect the health and well-being of citizens from environment-related risks and impacts. Specifically on clean air, the European Green Deal committed to further improving air

[36] OJ C […], […], p. […].

[37] OJ C […], […], p. […].

[38] Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (OJ L 023, 26.1.2005, p. 3).

[39] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (OJ L 152, 11.6.2008, p. 1).

[40] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions The European Green Deal; COM(2019) 640 final.

quality and to aligning EU air quality standards more closely with the recommendations of the World Health Organization (WHO). It also announced a strengthening of provisions on air quality monitoring, modelling and planning.

(3) In May 2021, the Commission adopted a Communication establishing a 'Zero Pollution Action Plan'[41] that inter alia addresses pollution aspects of the European Green Deal and further commits to reducing, by 2030, the health impact of air pollution by more than 55% and the EU ecosystems where air pollution threatens biodiversity by 25%.

(4) The Zero Pollution Action Plan also sets out a vision for the year 2050, where air pollution is reduced to levels no longer considered harmful to health and natural ecosystems. To this end, a staged approach towards setting current and future EU air quality standards should be pursued, establishing intermediate air quality standards for the year 2030 and beyond, and developing a perspective for alignment with the WHO Air Quality Guidelines by the year 2050 at the latest based on a regular review mechanism to take into account the latest scientific understanding. Given the links between pollution reduction and decarbonisation, the long-term objective to achieve the zero pollution ambition should be pursued hand in hand with reduction of greenhouse gas emissions as set by Regulation (EU) 2021/1119 of the European Parliament and of the Council[42].

(5) In taking the relevant measures at Union and national level to achieve the zero pollution objective for air pollution, Member States, the European Parliament, the Council and the Commission should be guided by the 'precautionary principle' and the 'polluter pays principle' established in the Treaty on the Functioning of the European Union, and the 'do no harm' principle of the European Green Deal. They should, inter alia, take into account: the contribution of improved air quality to public health, the quality of the environment, the well-being of citizens, the prosperity of society, employment and the competitiveness of the economy; the energy transition, strengthened energy security and the tackling of energy poverty; food security and affordability; the development of sustainable and smart mobility and transport solutions; the impact of behavioural changes; fairness and solidarity across and within Member States, in light of their economic capability, national circumstances, such as the specificities of islands, and the need for convergence over time; the need to make the transition just and socially fair through appropriate education and training programmes; best available and most recent scientific evidence, in particular the findings reported by the WHO; the need to integrate air pollution related risks into investment and planning decisions; cost-effectiveness and technological neutrality in achieving air pollutant emission reductions; and progression over time in environmental integrity and level of ambition.

(6) The 'Eighth General Union Environment Action Programme to 2030' adopted by Decision (EU) 2022/591 of the European Parliament and of the Council on 6 April 2022[43] establishes the objective to achieve a non-toxic environment protecting the

[41] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil' COM(2021) 400 final.

[42] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law') (OJ L 243, 9.7.2021, p. 1–17).

[43] Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030 (OJ L 114, 12.4.2022, p. 22–36).

health and well-being of people, animals and ecosystems from environment-related risks and negative impacts, and, for that purpose, stipulates that further improvement of monitoring methods, better information to the public and access to justice are needed. This guides the objectives set in this Directive.

(7) The Commission should regularly review the scientific evidence related to pollutants, their effects on human health and the environment and technological development. Based on the review, the Commission should assess whether applicable air quality standards are still appropriate to achieve the objectives of this Directive. The first review should be carried out by 31/12/2028 to assess whether air quality standards need to be updated based on the latest scientific information.

↓ 2008/50 recital 5 (adapted)

(8) A common approach to the assessment of ambient air quality should be followed ~~according to~~ ⌦ by applying ⌫ common assessment criteria. When assessing ambient air quality, account should be taken of the size of populations and ecosystems exposed to air pollution. It is therefore appropriate to classify the territory of each Member State into zones ~~or agglomerations~~ reflecting the population density.

↓ 2008/50 recital 14 (adapted)
⇨ new

(9) Fixed measurements should be mandatory in zones ~~and agglomerations~~ where ~~the long-term objectives for ozone or the~~ assessment thresholds ~~for other pollutants~~ are exceeded. ~~Information from fixed measurements may be supplemented by modelling techniques and/or indicative measurements to~~ ⌦ Modelling applications and indicative measurements, in addition to information from fixed measurements, ⌫ enable point data to be interpreted in terms of geographical distribution of concentrations. The use of ⌦ such ⌫ supplementary techniques of assessment should also allow for reduction of the required minimum number of fixed sampling points. ⇨ in zones where assessment thresholds are not exceeded. In zones where limit values or target values are exceeded, both fixed measurements and the use of modelling applications should be mandatory. Additional monitoring of background concentrations and deposition of pollutants in ambient air should also be carried out to enable better understanding of pollution levels and dispersion ⇦.

↓ 2008/50 recital 6 (adapted)
⇨ new

~~(10) Where possible~~ M~~m~~odelling ~~techniques~~ ⇨ applications ⇦ should be applied to enable point data to be interpreted in terms of geographical distribution of concentration ⇨ , to help to detect breaches of air quality standards, and to inform air quality plans and the placement of sampling points ⇦. ~~This could serve as a basis for calculating the collective exposure of the population living in the area.~~

⇨ In addition to the requirements for air quality monitoring defined in this Directive, for monitoring purposes, Member States are encouraged to exploit information products and supplementary tools (e.g. regular evaluation and quality assessment reports, policy online applications), provided by the Earth Observation component of

the EU Space Programme, in particular the Copernicus Atmosphere Monitoring Service (CAMS). ⇦

⇩ new

(11) It is important that pollutants of emerging concern, such as ultrafine particles, black carbon and elemental carbon, as well as ammonia and the oxidative potential of particulate matter, be monitored in order to support scientific understanding of their effects on health and the environment, as recommended by the WHO.

🡻 2008/50 recital 8 (adapted)
⇨ new

(12) Detailed measurements of fine particulate matter at rural background locations should be made in order to understand better the impacts of this pollutant and to develop appropriate policies. Such measurements should be made in a manner consistent with those of the cooperative programme for monitoring and evaluation of the long range transmission of air pollutants in Europe (EMEP) set up under the 1979 ⌦ United Nations Economic Commission for Europe (UNECE) ⌫ Convention on Long-range Transboundary Air Pollution approved by Council Decision 81/462/EEC of 11 June 1981[44] ⇨ and its Protocols, including the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone of 1999, which was revised in 2012 ⇦ .

🡻 2008/50 recital 7 (adapted)

(13) In order to ensure that the information collected on air pollution is sufficiently representative and comparable across the ⌦ Union ⌫ ~~Community~~, it is important that standardised measurement techniques and common criteria for the number and location of measuring stations are used for the assessment of ambient air quality. Techniques other than measurements can be used to assess ambient air quality and it is therefore necessary to define criteria for the use and required accuracy of such techniques.

🡻 2004/107 recital 12
⇨ new

(14) ~~Standardised accurate measurement techniques and common criteria for the location of measuring stations are important elements in assessing ambient air quality so that the information obtained is comparable throughout the Community.~~ Providing reference measurement methods is acknowledged to be an important issue. The Commission has already mandated work on the preparation of CEN standards for the measurement of ⇨ polycyclic aromatic hydrocarbons and for the evaluation of the performance of sensor systems for the determination of concentrations of gaseous pollutants and particulate matter in ambient air ⇦ ~~those constituents in ambient air where target values are defined (arsenic, cadmium, nickel and benzo(a)pyrene) as well as for the deposition of heavy metals~~ with a view to their early development and adoption. In the

[44] Council Decision 81/462/EEC of 11 June 1981 on the conclusion of the Convention on long-range transboundary air pollution (OJ L 171, 27.6.1981, p. 11).

absence of CEN standard methods, the use of international or national standard reference measurement methods should be permitted.

↓ 2008/50 recital 2 (adapted)
⇨ new

(15) In order to protect human health and the environment as a whole, it is particularly important to combat emissions of pollutants at source and to identify and implement the most effective emission reduction measures at local, national and ⌦ Union ⌫ ~~Community~~ level ⇨ , in particular when it comes to emissions from agriculture, industries, transport and energy generation ⇦ . Therefore, emissions of harmful air pollutants should be avoided, prevented or reduced and appropriate ⇨ standards ⇦ ~~objectives~~ set for ambient air quality taking into account relevant World Health ~~Organisation~~ ⌦ Organization ⌫ standards, guidelines and programmes.

↓ 2004/107 recital 3 (adapted)
⇨ new

~~(16)~~ Scientific evidence shows that ⇨ sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter, lead, benzene, carbon monoxide, ⇦ arsenic, cadmium, nickel, ~~and~~ some polycyclic aromatic hydrocarbons ⇨ and ozone ⇦ are ⇨ responsible for significant negative impacts on human health ⇦ ~~human genotoxic carcinogens and that there is no identifiable threshold below which these substances do not pose a risk to human health~~. Impact on human health and the environment occurs via concentrations in ambient air ~~and via deposition~~. ~~With a view to cost-effectiveness, ambient air concentrations of arsenic, cadmium, nickel and polycyclic aromatic hydrocarbons, which would not pose a significant risk to human health, cannot be achieved in specific areas.~~

↓ 2004/107 recital 11 (adapted)
⇨ new

~~(17)~~ The effects of ⇨ lead, ⇦ arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons on human health, including via the food chain, and the environment ~~as a whole~~, ⌦ also ⌫ occur ~~through concentrations in ambient air and~~ via deposition; the accumulation of these substances in soils and the protection of ground water should be taken into account. ~~In order to facilitate review of this Directive in 2010, the Commission and the Member States should consider promoting research into the effects of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons on human health and the environment, particularly via deposition.~~

⇩ new

~~(18)~~ The average exposure of the population to the pollutants with the highest documented impact on human health, fine particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2), should be reduced based on WHO recommendations. To this end, an average exposure reduction obligation should be introduced for these pollutants, in addition to limit values.

↓ 2004/107 recital 4
⇨ new

~~(19)~~ ⇨ The Fitness Check of the Ambient Air Quality Directives (Directives 2004/107/EC and 2008/50/EC)[45] has shown that limit values are more effective in bringing down pollutant concentrations than target values. ⇦ With the aim of minimising harmful effects on human health, paying particular attention to ⇨ vulnerable groups and ⇦ sensitive populations, and the environment ~~as a whole, of airborne arsenic, cadmium and nickel and polycyclic aromatic hydrocarbons, target~~ ⇨ limit ⇦ values should be set ⇨ for the concentration of sulphur dioxide, nitrogen dioxide, particulate matter, lead, benzene, carbon monoxide, arsenic, cadmium, nickel and polycyclic aromatic hydrocarbons in ambient air ⇦ ~~, to be attained as far as possible~~. Benzo(a)pyrene should be used as a marker for the carcinogenic risk of polycyclic aromatic hydrocarbons in ambient air.

⇩ new

(20) To allow Member States to prepare for revised air quality standards set by this Directive and to ensure legal continuity, for an interim period limit values should be identical to those set under the repealed Directives until the new limit values start applying.

↓ 2008/50 recital 13 (adapted)
⇨ new

(21) Ozone is a transboundary pollutant formed in the atmosphere from the emission of primary pollutants addressed by Directive 2016/2284/EU~~Directive 2001/81/EC~~ of the European Parliament and of the Council[46] ~~of 23 October 2001 on national emission ceilings for certain atmospheric pollutants~~[47]. Progress towards the air quality targets and long-term objectives for ozone set in this Directive should be determined by the targets and emission ⇨ reduction commitments ⇦ ~~ceilings~~ provided for in Directive 2016/2284/EU~~Directive 2001/81/EC~~ and, ~~if appropriate,~~ by implementing ⇨ cost-effective measures and ⇦ air quality plans ~~as provided for in this Directive~~.

↓ 2008/50 recital 12 (adapted)
⇨ new

(22) The ~~existing~~ ⇨ ozone ⇦ target values and long-term objectives of ensuring effective protection against harmful effects on human health and vegetation and ecosystems from exposure to ozone ~~should remain unchanged~~ ⇨ should be updated in light of the most recent recommendations of the World Health Organization ⇦ .

(23) An alert threshold ⇨ for sulphur dioxide, nitrogen dioxide, particulate matter (PM_{10} and $PM_{2.5}$) and ozone, ⇦ and an information threshold for ozone, should be set for the

[45] Fitness check of the Ambient Air Quality Directives of 28 November 2019 (SWD(2019) 427 final).

[46] Directive (EU) 2016/2284/EU of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (OJ L 344, 17.12.2016, p.1).

[47] ~~OJ L 309, 27.11.2001, p. 22. Directive as last amended by Council Directive 2006/105/EC (OJ L 363, 20.12.2006, p. 368).~~

protection of the general population ⇨, vulnerable ⇦ and sensitive sections, respectively, from brief exposures to elevated ozone concentrations. Those thresholds should trigger the dissemination of information to the public on the risks of exposure and the implementation, if appropriate, of short-term measures to reduce ~~ozone~~ ⇨ pollution ⇦ levels where the alert threshold is exceeded.

↓ 2004/107 recital 7 (adapted)

(24) In accordance with Article ⌦ 193 ⌫ ~~176~~ of the Treaty, Member States may maintain or introduce more stringent protective measures ~~relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons~~ provided that they are compatible with the Treaty and that they are notified to the Commission.

↓ 2008/50 recital 9
⇨ new

(25) Air quality status should be maintained where it is already good, or improved. Where the ⇨ standards ⇦ ~~objectives~~ for ambient air quality laid down in this Directive are ~~not met~~ ⇨ at risk of not being met, or have not been met, ⇦ Member States should take ⇨ immediate ⇦ action in order to comply with the limit values ⇨ , average exposure reduction obligations ⇦ and critical levels, and where possible, to attain the ⇨ ozone ⇦ target values and long-term objectives.

↓ 2004/107 recital 9

(26) Mercury is a very hazardous substance for human health and the environment. It is present throughout the environment and, in the form of methylmercury, has the capacity to accumulate in organisms, and in particular to concentrate in organisms higher up the food chain. Mercury released into the atmosphere is capable of being transported over long distances.

↓ 2004/107 recital 10 (adapted)
⇨ new

(27) ~~The Commission intends to come forward in 2005 with a coherent strategy containing measures to~~ ⌦ Regulation 2017/852 of the European Parliament and the Council[48] aims to ⌫ protect human health and the environment from the release of mercury, based on a life-cycle approach, and taking into account production, use, waste treatment and emissions. ~~In this context, the Commission should consider all appropriate measures with a view to reducing the quantity of mercury in terrestrial and aquatic ecosystems, and thereby the ingestion of mercury via food, and avoiding mercury in certain products.~~ ⇨ Provisions on monitoring mercury in this Directive complement and inform that Regulation. ⇦

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[48] Regulation (EU) 2017/852 of the European Parliament and of the Council of 17 May 2017 on mercury, and repealing Regulation (EC) No 1102/2008 (OJ L 137, 24.5.2017, p. 1–21).

↓ 2008/50 recital 10
⇨ new

(28) The risk posed by air pollution to vegetation and natural ecosystems is most important in places away from urban areas. The assessment of such risks and the compliance with critical levels for the protection of vegetation should therefore focus on places away from built-up areas. ⇨ This assessment should take into account and complement requirements under Directive 2016/2284/EU to monitor the impacts of air pollution on terrestrial and aquatic ecosystems, and to report such impacts. ⇦

↓ 2008/50 recital 15 (adapted)
⇨ new

(29) Contributions from natural sources can be assessed but cannot be controlled. Therefore, where natural contributions to pollutants in ambient air can be determined with sufficient certainty, and where exceedances are due in whole or in part to these natural contributions, these may, under the conditions laid down in this Directive, be subtracted when assessing compliance with air quality limit values ⇨ and average exposure reduction obligations ⇦ . Contributions to exceedances of particulate matter ~~PM_{10}~~ limit values attributable to winter-sanding or ⌦ winter ⌫ -salting of roads may also be subtracted when assessing compliance with air quality limit values provided that reasonable measures have been taken to lower concentrations.

↓ 2008/50 recital 16

~~(30)~~ For zones ~~and agglomerations~~ where conditions are particularly difficult, it should be possible to postpone the deadline for compliance with the air quality limit values in cases where, notwithstanding the implementation of appropriate pollution abatement measures, acute compliance problems exist in specific zones and agglomerations. Any postponement for a given zone or agglomeration should be accompanied by a comprehensive plan to be assessed by the Commission to ensure compliance by the revised deadline. ~~The availability of necessary Community measures reflecting the chosen ambition level in the Thematic Strategy on air pollution to reduce emissions at source will be important for an effective emission reduction by the timeframe established in this Directive for compliance with the limit values and should be taken into account when assessing requests to postpone deadlines for compliance.~~

↓ 2008/50 recital 18
⇨ new

(31) Air quality plans should be developed and updated for zones ~~and agglomerations~~ within which concentrations of pollutants in ambient air exceed the relevant air quality ~~target values or~~ limit values ⇨ , ozone target values or average exposure reduction obligations ⇦ ~~, plus any temporary margins of tolerance, where applicable~~. Air pollutants are emitted from many different sources and activities. To ensure coherence between different policies, such air quality plans should where feasible be consistent~~,~~ ~~and integrated~~ with plans and programmes prepared pursuant to Directive 2010/75/EU 2001/80/EC of the European Parliament and of the Council ~~of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion~~

~~plants~~[4950], Directive (EU) 2016/2284~~Directive 2001/81/EC~~, and Directive 2002/49/EC of the European Parliament and of the Council ~~of 25 June 2002 relating to the assessment and management of environmental noise~~[5152]. ~~Full account will also be taken of the ambient air quality objectives provided for in this Directive, where permits are granted for industrial activities pursuant to Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control~~[53].

⇩ new

(32) Air quality plans should also be prepared ahead of 2030 where there is a risk that Member States will not attain the limit values or ozone target value by that date in order to ensure that levels of pollutants are reduced accordingly.

🡻 2008/50 recital 19
⇨ new

(33) Action plans should be drawn up indicating the measures to be taken in the short term where there is a risk of an exceedance of one or more alert thresholds in order to reduce that risk and to limit its duration. When the risk applies to one or more limit values or target values, Member States may, where appropriate, draw up such short-term action plans. ~~In respect of ozone, such short-term action plans should take into account the provisions of Commission Decision 2004/279/EC of 19 March 2004 concerning guidance for implementation of Directive 2002/3/EC of the European Parliament and of the Council relating to ozone in ambient air.~~

🡻 2008/50 recital 20
⇨ new

(34) Member States should ~~consult~~ ⇨ cooperate ⇦ with one another if, following significant pollution originating in another Member State, the level of a pollutant exceeds, or is likely to exceed, ~~the relevant air quality~~ ⇨ any limit value, ozone target value, average exposure reduction obligation ⇦ ~~air quality objectives plus the margin of tolerance where applicable~~ or~~, as the case may be, the~~ alert threshold. The transboundary nature of specific pollutants, such as ozone and particulate matter, may require coordination between neighbouring Member States in drawing up and implementing air quality plans and short-term action plans and in informing the public. Where appropriate, Member States should pursue cooperation with third countries, with particular emphasis on the early involvement of candidate countries. ⇨ The Commission should be timely informed of and invited to assist in any such cooperation. ⇦

49 ~~OJ L 309, 27.11.2001, p. 1. Directive as last amended by Directive 2006/105/EC.~~

50 Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (OJ L 334, 17.12.2010, p. 17).

51 ~~OJ L 189, 18.7.2002, p. 12.~~

52 Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise (OJ L 189, 18.7.2002, p. 12.)

53 ~~OJ L 24, 29.1.2008, p. 8.~~

↓ 2008/50 recital 21
⇨ new

(35) It is necessary for the Member States and the Commission to collect, exchange and disseminate air quality information in order to understand better the impacts of air pollution and develop appropriate policies. Up-to-date information on concentrations of all regulated pollutants in ambient air ⇨ as well as air quality plans and short-term action plans ⇦ should also be readily available to the public.

↓ 2008/50 recital 22
⇨ new

(36) ⇨ Information on the concentrations and the deposition of the regulated pollutants should be forwarded to the Commission as a basis for regular reports. ⇦ In order to facilitate the handling and comparison of air quality information, data should be made available to the Commission in a standardised form.

↓ 2008/50 recital 23

(37) It is necessary to adapt procedures for data provision, assessment and reporting of air quality to enable electronic means and the Internet to be used as the main tools to make information available, and so that such procedures are compatible with Directive 2007/2/EC of the European Parliament and the Council ~~of 14 March 2007 establishing an infrastructure for spatial information in the European Community (INSPIRE)~~[54].

↓ 2008/50 recital 24

(38) It is appropriate to provide for the possibility of adapting the criteria and techniques used for the assessment of the ambient air quality to scientific and technical progress and adapting thereto the information to be provided.

⇩ new

(39) As clarified by the case-law of the Court of Justice[55], Member States may not restrict legal standing to challenge a decision of a public authority to those members of the public concerned who participated in the preceding administrative procedure to adopt that decision. As also clarified by the case-law of the Court of Justice[56], effective access to justice in environmental matters and effective remedies requires inter alia that members of the public concerned should have the right to ask the court or a competent independent and impartial body to order interim measures to prevent a given instance of pollution. Therefore, it should be specified that legal standing should not be made conditional on the role that the concerned member of the public played

[54] Directive 2007/2/EC of the European Parliament and the Council of 14 March 2007 establishing an infrastructure for spatial information in the European Community (INSPIRE) (OJ L 108, 25.4.2007, p. 1).

[55] Case C–826/18, Judgment of the Court (First Chamber) of 14 January 2021; LB and Others v College van burgemeester en wethouders van de gemeente Echt-Susteren; paragraphs 58 and 59.

[56] Case C-416/10 Judgment of the Court (Grand Chamber), 15 January 2013; Jozef Križan and Others v Slovenská inšpekcia životného prostredia.Križan, paragraph 109.

during a participatory phase of the decision-making procedures under this Directive. In addition, any review procedure should be fair, equitable, timely and not prohibitively expensive, and provide for adequate and effective redress mechanisms, including injunctive relief as appropriate.

↓ 2008/50 recital 30
⇨ new

(40) This Directive respects the fundamental rights and observes the principles recognised in particular by the Charter of Fundamental Rights of the European Union. ~~In particular, this Directive seeks to promote the integration into the policies of the Union of a high level of environmental protection and the improvement of the quality of the environment in accordance with the principle of sustainable development as laid down in Article 37 of the Charter of Fundamental Rights of the European Union.~~ ⇨ Where damage to human health has occurred as a result of a violation of Articles 19, 20, 21 of this Directive, Member States should ensure that the individuals affected by such violations are able to claim and obtain compensation for that damage from the relevant competent authority. The rules on compensation, access to justice and penalties set in this Directive have the objective to avoid, prevent and reduce harmful effects on human health and the environment from air pollution, in line with Article 191(1) TFEU. They thus seeks to integrate into the policies of the Union a high level of environmental protection and the improvement of the quality of the environment in accordance with the principle of sustainable development as laid down in Article 37 of the Charter, and puts into concrete terms the obligation to protect the right to life and to the integrity of the person laid down in Articles 2 and 3 of the Charter. It also contributes to the right to an effective remedy before a tribunal as laid down in Article 47 of the Charter, in relation to the protection of human health. ⇦

↓ 2008/50 recital 28 (adapted)

~~The obligation to transpose this Directive into national law should be confined to those provisions which represent a substantive change as compared with the earlier Directives.~~

↓ 2008/50 recital 29 (adapted)

~~In accordance with point 34 of the Interinstitutional Agreement on better lawmaking57, Member States are encouraged to draw up, for themselves and in the interest of the Community, their own tables illustrating, as far as possible, the correlation between the Directive and the transposition measures, and to make them public.~~

⇩ new

(41) In order to ensure uniform conditions for the implementation of the Member States' requirements on transmitting information and reporting on air quality under this Directive, implementing powers should be conferred on the Commission as regards (i) the establishment of rules relating to information on ambient air quality to be made

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57 ~~OJ C 321, 31.12.2003, p. 1.~~

available by Member States to the Commission as well as timescales in which that information is to be communicated and (ii) to the streamlining of the way data are reported and the reciprocal exchange of information and data from networks and individual sampling points measuring ambient air pollution within Member States. Those powers should be exercised in accordance with Regulation (EU) No 182/2011 of the European Parliament and of the Council[58].

(42) In order to ensure that this Directive continues meeting its objectives, in particular to avoid, prevent and reduce harmful effects from ambient air quality on human health and the environment, the power to adopt acts in accordance with Article 290 of the Treaty on the Functioning of the European Union should be delegated to the Commission in respect of amending the annexes to this Directive to take account of technical and scientific developments related to air pollutants, their assessment and management, their impacts on human health and the environment and to appropriate information of the public. It is of particular importance that the Commission carry out appropriate consultations during its preparatory work, including at expert level, and that those consultations be conducted in accordance with the principles laid down in the Interinstitutional Agreement of 13 April 2016 Better Law Making[59]. In particular, to ensure equal participation in the preparation of delegated acts, the European Parliament and the Council receive all documents at the same time as Member States' experts, and their experts systematically have access to meetings of Commission expert groups dealing with the preparation of delegated acts.

(43) The obligation to transpose this Directive into national law should be confined to those provisions which represent a substantive amendment as compared to the earlier Directives. The obligation to transpose the provisions which are unchanged arises under the earlier Directives.

(44) This Directive should be without prejudice to the obligations of the Member States relating to the time-limits for the transposition into national law of the Directives set out in Part B of Annex X.

↓ 2004/107 recital 1 (adapted)

~~On the basis of principles enshrined in Article 175(3) of the Treaty, the Sixth Community Environment Action Programme, adopted by Decision No 1600/2002/EC of the European Parliament and of the Council60, establishes the need to reduce pollution to levels which minimise harmful effects on human health, paying particular attention to sensitive populations, and the environment as a whole, to improve the monitoring and assessment of air quality including the deposition of pollutants and to provide information to the public.~~

↓ 2004/107 recital 2 (adapted)

~~Article 4(1) of Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management61 requires the Commission to submit proposals for regulating the pollutants listed in Annex I to that Directive taking into account the provisions laid down in paragraphs 3 and 4 of that Article.~~

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58 OJ L 55, 28.2.2011, p. 13–18

59 OJ C 321, 31.12.2003, p. 1.

60 ~~OJ L 242, 10.9.2002, p. 1.~~

61 ~~OJ L 296, 21.11.1996, p. 55. Directive as amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).~~

↓ 2004/107 recital 5

~~The target values would not require any measures entailing disproportionate costs. Regarding industrial installations, they would not involve measures beyond the application of best available techniques (BAT) as required by Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control[62] and in particular would not lead to the closure of installations. However, they would require Member States to take all cost-effective abatement measures in the relevant sectors.~~

↓ 2004/107 recital 6

~~In particular, the target values of this Directive are not to be considered as environmental quality standards as defined in Article 2(7) of Directive 96/61/EC and which, according to Article 10 of that Directive, require stricter conditions than those achievable by the use of BAT.~~

↓ 2004/107 recital 8

~~Where concentrations exceed certain assessment thresholds, monitoring of arsenic, cadmium, nickel and benzo(a)pyrene should be mandatory. Supplementary means of assessment may reduce the required number of sampling points for fixed measurements. Further monitoring of background ambient air concentrations and deposition is foreseen.~~

↓ 2004/107 recital 13

~~Information on the concentrations and the deposition of the regulated pollutants should be forwarded to the Commission as a basis for regular reports.~~

↓ 2004/107 recital 14

~~Up-to-date information on ambient air concentrations and deposition of regulated pollutants should be readily available to the public.~~

↓ 2004/107 recital 15

~~The Member States should lay down rules on penalties applicable to infringements of the provisions of this Directive and ensure that they are implemented. Those penalties should be effective, proportionate and dissuasive.~~

↓ 2004/107 recital 16

~~The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission[63].~~

[62] ~~OJ L 257, 10.10.1996, p. 26. Directive as last amended by Regulation (EC) No 1882/2003.~~

[63] ~~OJ L 184, 17.7.1999, p. 23.~~

↓ 2004/107 recital 17

~~The amendments necessary for adaptation of this Directive to scientific and technical progress should relate solely to criteria and techniques for the assessment of concentrations and deposition of regulated pollutants or detailed arrangements for forwarding information to the Commission. They should not have the effect of modifying the target values either directly or indirectly,~~

↓ 2008/50 recital 1 (adapted)

~~The Sixth Community Environment Action Programme adopted by Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002[64] establishes the need to reduce pollution to levels which minimise harmful effects on human health, paying particular attention to sensitive populations, and the environment as a whole, to improve the monitoring and assessment of air quality including the deposition of pollutants and to provide information to the public.~~

↓ 2008/50 recital 2

~~In order to protect human health and the environment as a whole, it is particularly important to combat emissions of pollutants at source and to identify and implement the most effective emission reduction measures at local, national and Community level. Therefore, emissions of harmful air pollutants should be avoided, prevented or reduced and appropriate objectives set for ambient air quality taking into account relevant World Health Organisation standards, guidelines and programmes.~~

↓ 2008/50 recital 3 (adapted)

~~Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management[65], Council 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[66], Directive 2000/69/EC of the European Parliament and of the Council of 16 November 2000 relating to limit values for benzene and carbon monoxide in ambient air[67], Directive 2002/3/EC of the European Parliament and of the Council of 12 February 2002 relating to ozone in ambient air[68] and Council Decision 97/101/EC of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States[69] need to be substantially revised in order to incorporate the latest health and scientific developments and the experience of the Member States. In the interests of clarity, simplification and administrative efficiency it is therefore appropriate that those five acts be replaced by a single Directive and, where appropriate, by implementing measures.~~

64 ~~OJ L 242, 10.9.2002, p. 1.~~

65 ~~OJ L 296, 21.11.1996, p. 55. Directive as amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).~~

66 ~~OJ L 163, 29.6.1999, p. 41. Directive as amended by Commission Decision 2001/744/EC (OJ L 278, 23.10.2001, p. 35).~~

67 ~~OJ L 313, 13.12.2000, p. 12.~~

68 ~~OJ L 67, 9.3.2002, p. 14.~~

69 ~~OJ L 35, 5.2.1997, p. 14. Decision as amended by Commission Decision 2001/752/EC (OJ L 282, 26.10.2001, p. 69).~~

↓ 2008/50 recital 4 (adapted)

~~Once sufficient experience has been gained in relation to the implementation of Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air[70] consideration may be given to the possibility of merging its provisions with those of this Directive.~~

↓ 2008/50 recital 11

~~Fine particulate matter ($PM_{2,5}$) is responsible for significant negative impacts on human health. Further, there is as yet no identifiable threshold below which $PM_{2,5}$ would not pose a risk. As such, this pollutant should not be regulated in the same way as other air pollutants. The approach should aim at a general reduction of concentrations in the urban background to ensure that large sections of the population benefit from improved air quality. However, to ensure a minimum degree of health protection everywhere, that approach should be combined with a limit value, which is to be preceded in a first stage by a target value.~~

↓ 2008/50 recital 17

~~The necessary Community measures to reduce emissions at source, in particular measures to improve the effectiveness of Community legislation on industrial emissions, to limit the exhaust emissions of engines installed in heavy duty vehicles, to further reduce the Member States' permitted national emissions of key pollutants and the emissions associated with refuelling of petrol cars at service stations, and to address the sulphur content of fuels including marine fuels should be duly examined as a priority by all institutions involved.~~

↓ 2008/50 recital 18

~~Air quality plans should be developed for zones and agglomerations within which concentrations of pollutants in ambient air exceed the relevant air quality target values or limit values, plus any temporary margins of tolerance, where applicable. Air pollutants are emitted from many different sources and activities. To ensure coherence between different policies, such air quality plans should where feasible be consistent, and integrated with plans and programmes prepared pursuant to Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants[71], Directive 2001/81/EC, and Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise[72]. Full account will also be taken of the ambient air quality objectives provided for in this Directive, where permits are granted for industrial activities pursuant to Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control[73].~~

70 ~~OJ L 23, 26.1.2005, p. 3.~~

71 ~~OJ L 309, 27.11.2001, p. 1. Directive as last amended by Directive 2006/105/EC.~~

72 ~~OJ L 189, 18.7.2002, p. 12.~~

73 ~~OJ L 24, 29.1.2008, p. 8.~~

↓ 2008/50 recital 25 (adapted)

~~Since the objectives of this Directive cannot be sufficiently achieved by the Member States by reason of the transboundary nature of air pollutants and can therefore be better achieved at Community level, the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives.~~

↓ 2008/50 recital 26

~~Member States should lay down rules on penalties applicable to infringements of the provisions of this Directive and ensure that they are implemented. The penalties should be effective, proportionate and dissuasive.~~

↓ 2008/50 recital 27 (adapted)

~~Certain provisions of the acts repealed by this Directive should remain in force in order to ensure the continuance of existing air quality limits for nitrogen dioxide until they are replaced from 1 January 2010, the continuance of air quality reporting provisions until new implementing measures are adopted, and the continuance of obligations relating to the preliminary assessments of air quality required under Directive 2004/107/EC.~~

↓ 2008/50 recital 31

~~The measures necessary for the implementation of this Directive should be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission[74].~~

↓ 2008/50 recital 32

~~The Commission should be empowered to amend Annexes I to VI, Annexes VIII to X and Annex XV. Since those measures are of general scope and are designed to amend non-essential elements of this Directive, they must be adopted in accordance with the regulatory procedure with scrutiny provided for in Article 5a of Decision 1999/468/EC.~~

↓ 2008/50 recital 33 (adapted)

~~The transposition clause requires Member States to ensure that the necessary urban background measurements are in place well in time to define the Average Exposure Indicator, in order to guarantee that the requirements related to the assessment of the National Exposure Reduction Target and to the calculation of the Average Exposure Indicator are met,~~

~~[74] OJ L 184, 17.7.1999, p. 23. Decision as amended by Decision 2006/512/EC (OJ L 200, 22.7.2006, p. 11).~~

↓ 2008/50

HAVE ADOPTED THIS DIRECTIVE:

CHAPTER I

GENERAL PROVISIONS

↓ 2004/107

~~*Article 1*~~

~~**Objectives**~~

~~The objectives of this Directive shall be to:~~

~~(a) establish a target value for the concentration of arsenic, cadmium, nickel and benzo(a)pyrene in ambient air so as to avoid, prevent or reduce harmful effects of arsenic, cadmium, nickel and polycyclic aromatic hydrocarbons on human health and the environment as a whole;~~

~~(b) ensure, with respect to arsenic, cadmium, nickel and polycyclic aromatic hydrocarbons, that ambient air quality is maintained where it is good and that it is improved in other cases;~~

~~(c) determine common methods and criteria for the assessment of concentrations of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air as well as of the deposition of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons;~~

~~(d) ensure that adequate information on concentrations of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air as well as on the deposition of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons is obtained and ensure that it is made available to the public.~~

⇩ new

Article 1

Objectives

1. This Directive sets out a zero pollution objective for air quality, so that within the Union air quality is progressively improved to levels no longer considered harmful to human health and natural ecosystems, as defined by scientific evidence, thus contributing to a toxic-free environment at the latest by 2050.

2. This Directive sets intermediate limit values, target values, average exposure reduction obligations, average exposure concentration objectives, critical levels, information thresholds, alert thresholds and long-term objectives (‘air quality

standards') to be met by the year 2030, and regularly reviewed thereafter in accordance with Article 3.

3. Furthermore, this Directive contributes to achieving: the Union's pollution-reduction, biodiversity and ecosystem objectives in accordance with the 8th Environment Action Programme, as set out in Decision (EU) 2022/591 of the European Parliament and of the Council[75].

↓ 2008/50 (adapted)
⇨ new

Article 2

⌦ Subject matter ⌫

This Directive lays down ⌦ the following ⌫ measures ~~aimed at the following~~:

1. ⌦ measures ⌫ defining and establishing objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment ~~as a whole~~;
2. ⌦ measures setting common methods and criteria to assess ⌫ ~~assessing~~ the ambient air quality in Member States ~~on the basis of common methods and criteria~~;
3. ⇨ measures for monitoring ⇦ ~~obtaining information on~~ ambient air quality~~, in order to help combat air pollution and nuisance and to monitor~~ long-term trends and ~~improvements resulting from~~ ⇨ impacts of ⇦ ~~national and~~ ~~Community~~ ⌦ Union and national ⌫ measures ⇨ on ambient air quality ⇦ ;
4. ⌦ measures ⌫ ensuring that ~~such~~ ⌦ the ⌫ information on ambient air quality is made available to the public;
5. ⌦ measures ⌫ maintaining air quality where it is good and improving it in other cases;
6. ⌦ measures ⌫ promoting increased cooperation between ~~the~~ Member States in reducing air pollution.

⇩ new

Article 3

Regular review

1. By 31 December 2028, and every 5 years thereafter, and more often if substantial new scientific findings point to the need for it, the Commission shall review the scientific evidence related to air pollutants and their effects on human health and the environment relevant to achieving the objective set in Article 1 and present a report with the main findings to the European Parliament and to the Council.

2. The review shall assess whether applicable air quality standards are still appropriate to achieve the objective of avoiding, preventing or reducing harmful effects on human health and the environment and whether additional air pollutants should be covered.

In order to achieve the objectives set in Article 1, the review shall assess whether this Directive needs to be revised with a view to ensuring alignment with the World Health Organization (WHO) Air Quality Guidelines and the latest scientific information.

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[75] Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030 (OJ L 114, 12.4.2022, p. 22).

For the purposes of the review, the Commission shall take into account, inter alia, the following:

(a) latest scientific information from WHO and other relevant organisations,

(b) technological developments impacting air quality and its assessment,

(c) air quality situations and associated impacts on human health and the environment in Member States,

(d) progress made in implementing national and Union reduction measures for pollutants and improving air quality.

3. The European Environment Agency shall assist the Commission in carrying out the review.

4. Where the Commission considers it appropriate, as a result of the review, it shall present a proposal to revise air quality standards or to cover other air pollutants.

↓ 2008/50 (adapted)
⇨ new

Article 42

Definitions

For the purposes of this Directive ⌦ , the following definitions apply ⌫ :

(1) 'ambient air' ~~shall mean~~ ⌦ means ⌫ outdoor air in the troposphere, excluding workplaces as defined ~~by~~ ⌦ in Article 2 of Council ⌫ Directive 89/654/EEC[76] where provisions concerning health and safety at work apply and to which members of the public do not have regular access;

(2) 'pollutant' ~~shall mean~~ ⌦ means ⌫ any substance present in ambient air and likely to have harmful effects on human health ~~and/~~or the environment ~~as a whole~~;

(3) 'level' ~~shall mean~~ ⌦ means ⌫ the concentration of a pollutant in ambient air or the deposition thereof on surfaces in a given time;

↓ 2004/107 (adapted)

~~*Article 2*~~

~~**Definitions**~~

~~For the purposes of this Directive the definitions in Article 2 of Directive 96/62/EC, with the exception of the definition of 'target value', shall apply.~~

~~The objectives of this Directive shall be to:~~

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76 Council Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace (first individual directive within the meaning of Article 16 (1) of Directive 89/391/EEC) (OJ L 393, 30.12.1989, p. 1). Directive as amended by Directive 2007/30/EC of the European Parliament and of the Council (OJ L 165, 27.6.2007, p. 21).

~~(a)'target value' means a concentration in the ambient air fixed with the aim of avoiding, preventing or reducing harmful effects on human health and the environment as a whole, to be attained where possible over a given period;~~

(4) ~~(b)~~ 'total ~~or bulk~~ deposition' means the total mass of pollutants which is transferred from the atmosphere to surfaces ⌦, such as ⌫ ~~(e.g.~~ soil, vegetation, water, buildings, ~~etc.)~~ in a given area within a given time;

↓ 2008/50 (adapted)

(5) ~~18.~~'PM_{10}' ~~shall mean~~ ⌦ means ⌫ particulate matter which passes through a size-selective inlet as defined in the reference method for the sampling and measurement of PM_{10}, EN 12341, with a 50 % efficiency cut-off at 10 μm aerodynamic diameter;

(6) ~~19.~~'$PM_{2.5}$' ~~shall mean~~ ⌦ means ⌫ particulate matter which passes through a size-selective inlet as defined in the reference method for the sampling and measurement of $PM_{2.5}$, EN 14907, with a 50 % efficiency cut-off at 2,5 μm aerodynamic diameter;

~~(7) 24.~~'oxides of nitrogen' ~~shall mean~~ ⌦ means ⌫ the sum of the volume mixing ratio (ppbv) of nitrogen monoxide (nitric oxide) and nitrogen dioxide expressed in units of mass concentration of nitrogen dioxide ($\mu g/m^3$);

↓ 2004/107 (adapted)

~~(c)'upper assessment threshold' means a level specified in Annex II below which a combination of measurements and modelling techniques may be used to assess ambient air quality, in accordance with Article 6(3) of Directive 96/62/EC;~~

~~(d)'lower assessment threshold' means a level specified in Annex II below which the sole use of modelling or objective estimation techniques shall be possible to assess ambient air quality, in accordance with Article 6(4) of Directive 96/62/EC;~~

~~(e)'fixed measurements' means measurements taken at fixed sites either continuously or by random sampling, in accordance with Article 6(5) of Directive 96/62/EC;~~

(8) ~~(f)~~'arsenic', 'cadmium', 'nickel' and 'benzo(a)pyrene' mean the total content of these elements and compounds in the PM_{10} fraction;

~~(g) 'PM_{10}' means particulate matter, which passes through a size-selective inlet as defined in EN 12341 with a 50 % efficiency cut-off at 10 μm aerodynamic diameter;~~

(9) ~~(h)~~'polycyclic aromatic hydrocarbons' means those organic compounds, composed of at least two fused aromatic rings made entirely from carbon and hydrogen;

(10) ~~(i)~~'total gaseous mercury' means elemental mercury vapour (Hg^0) and reactive gaseous mercury, i.e. water-soluble mercury species with sufficiently high vapour pressure to exist in the gas phase;~~.~~

↓ 2008/50 (adapted)

(11) ~~27.~~‘volatile organic compounds’ (VOC) ~~shall mean~~ ⌦ means ⌫ organic compounds from anthropogenic and biogenic sources, other than methane, that are capable of producing photochemical oxidants by reactions with nitrogen oxides in the presence of sunlight;

~~(12)~~ ~~28.~~‘ozone precursor substances’ means substances which contribute to the formation of ground-level ozone~~;~~ ~~some of which are listed in Annex X.~~

⇩ new

(13) “black carbon” (BC) means equivalent black carbon (eBC) derived from optical methods.

(14) “ultrafine particles” (UFP) means the particle number concentrations in cm^3 for a size range with a lower limit of ≤ 10 nm and for a size range with no restriction on the upper limit.

↓ 2008/50 (adapted)
⇨ new

(15) ~~16.~~‘zone’ ~~shall mean~~ ⌦ means ⌫ part of the territory of a Member State, as delimited by that Member State for the purposes of air quality assessment and management;

(16) ~~17.~~‘agglomeration’ ~~shall mean~~ ⌦ means ⌫ ~~a zone that is~~ a conurbation with a population in excess of 250 000 inhabitants or, where the population is 250 000 inhabitants or ~~less~~ ⌦ fewer ⌫ , with a given population density per km^2 to be established by the Member States;

(17) ~~4.~~‘assessment’ ~~shall mean~~ ⌦ means ⌫ any method used to measure, calculate, predict or estimate levels;

(18) ~~12.~~‘~~upper~~ assessment threshold’ ~~shall mean~~ ⌦ means ⌫ ~~a~~ ⌦ the ⌫ level ~~below which a combination of fixed measurements and modelling techniques and/or indicative measurements may~~ ⇨ that determines the required assessment regime to ⇦ be used to assess ambient air quality;

~~13. ‘lower assessment threshold’ shall mean a level below which modelling or objective estimation techniques alone may be used to assess ambient air quality;~~

(19) ~~25.~~‘fixed measurements’ ~~shall mean~~ ⌦ means ⌫ measurements taken at ⇨ sampling points ⇦ ~~fixed sites~~, either continuously or by random sampling, ⇨ at constant locations for at least 1 calendar year ⇦ to determine the levels in accordance with the relevant data quality objectives;

(20) ~~26.~~‘indicative measurements’ ~~shall mean~~ ⌦ means ⌫ measurements which meet data quality objectives that are less strict than those required for fixed measurements;

⇩ new

(21) ‘objective estimation’ means an assessment method to obtain quantitative or qualitative information on the concentration or deposition level of a pollutant through expert judgement, which may include use of statistical tools, remote sensing, and in-situ sensors;

(22) ‘spatial representativeness’ means an assessment approach whereby the air quality metrics observed at a sampling point are representative for an explicitly delineated geographical area to the extent that air quality metrics within that area do not differ from the metrics observed at the sampling point by more than a pre-defined tolerance level;

🡻 2008/50 (adapted)

(23) ~~23.~~ ‘urban background locations’ ~~shall mean~~ ⌦ means ⌫ places in urban areas where levels are representative of the exposure of the general urban population;

⇩ new

(24) ‘rural background locations’ means places in rural areas with low population density where levels are representative of the exposure of the general rural population;

(25) ‘monitoring supersite’ means a monitoring station at an urban background or rural background location that combines multiple sampling points to gather long-term data on several pollutants;

🡻 2008/50 (adapted)
⇨ new

(26) ~~5.~~‘limit value’ ~~shall mean~~ ⌦ means ⌫ a level ⌦ which is not to be exceeded and which is ⌫ fixed on the basis of scientific knowledge, with the aim of avoiding, preventing or reducing harmful effects on human health ~~and/~~or the environment ~~as a whole, to be attained within a given period and not to be exceeded once attained~~;

(27) ~~9.~~‘ ⇨ ozone ⇦ target value’ ~~shall mean~~ ⌦ means ⌫ a level fixed ⇨ on the basis of scientific knowledge, ⇦ with the aim of avoiding, preventing or reducing harmful effects ⇨ from ozone ⇦ on human health ~~and/~~or the environment ~~as a whole~~, to be ⌦ complied with ⌫ ~~attained~~ where possible over a given period;

(28) ~~20.~~‘average exposure indicator’ ~~shall mean~~ ⌦ means ⌫ an average level determined on the basis of measurements at urban background locations throughout the ~~territory of a Member State~~ ⇨ territorial unit at NUTS 1 level as described in Regulation (EC) No 1059/2003, or, if there is no urban area located in that territorial unit, at rural background locations, ⇦ and which reflects population exposure~~. It is~~, used to ~~calculate~~ ⇨ check whether ⇦ the ~~national~~ ⇨ average ⇦ exposure reduction ⇨ obligation ⇦ ~~target~~ and the

⇨ average ⇦ exposure concentration ~~obligation~~ ⇨ objective for that territorial unit have been met ⇦ ;

~~(29) 22.~~‘~~national~~ ⇨ average ⇦ exposure reduction ⇨ obligation ⇦ ~~target~~’ ~~shall mean~~ ⌦ means ⌫ a percentage reduction of the average exposure of the population ⇨ , expressed as average exposure indicator, ⇦ of a ⇨ territorial unit at NUTS 1 level as described in Regulation (EC) No 1059/2003 of the European Parliament and of the Council[77] ⇦ ~~Member State~~ set for the reference year with the aim of reducing harmful effects on human health, to be attained ~~where possible~~ over a given period;

(30) ~~21.~~‘ ⇨ average ⇦ exposure concentration ⇨ objective ⇦ ~~obligation~~’ ~~shall mean~~ ⌦ means ⌫ a level ~~fixed on the basis~~ of the average exposure indicator ⌦ to be attained, ⌫ with the aim of reducing harmful effects on human health~~, to be attained over a given period~~;

(31) ~~6.~~‘critical level’ ~~shall mean~~ ⌦ means ⌫ a level ~~fixed on the basis of scientific knowledge,~~ above which direct adverse effects may occur on some receptors, such as trees, other plants or natural ecosystems but not on humans;

(32) ~~11.~~‘information threshold’ ~~shall mean~~ ⌦ means ⌫ a level beyond which there is a risk to human health from brief exposure for particularly sensitive ~~sections of the~~ population ⌦ and vulnerable groups ⌫ and for which immediate and appropriate information is necessary;

(33) ~~10.~~‘alert threshold’ ~~shall mean~~ ⌦ means ⌫ a level beyond which there is a risk to human health from brief exposure for the population as a whole and at which immediate steps are to be taken by ~~the~~ Member States;

~~7. ‘margin of tolerance’ shall mean the percentage of the limit value by which that value may be exceeded subject to the conditions laid down in this Directive;~~

(34) ~~14.~~‘long-term objective’ ~~shall mean~~ ⌦ means ⌫ a level to be attained in the long-term, save where not achievable through proportionate measures, with the aim of providing effective protection of human health and the environment;

(35) ~~15.~~‘contributions from natural sources’ ~~shall mean~~ ⌦ means ⌫ emissions of pollutants not caused directly or indirectly by human activities, including natural events such as volcanic eruptions, seismic activities, geothermal activities, wild-land fires, high-wind events, sea sprays or the atmospheric re-suspension or transport of natural particles from dry regions;

(36) ~~8.~~‘air quality plans’ ~~shall mean~~ ⌦ means ⌫ plans that set out measures in order to ~~attain the~~ ⌦ comply with ⌫ limit values, ~~or~~ ⇨ ozone ⇦ target values ⇨ or average exposure reduction obligations ⇦ ;

⇩ new

(37) ‘short-term action plans’ means plans that set out emergency measures to be taken in the short term to reduce the immediate risk or the duration of the exceedance of the alert thresholds;

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[77] Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS) (OJ L 154, 21.6.2003, p. 1).

(38) ‘the public concerned’ means the public affected or likely to be affected by exceedances of air quality standards, or having an interest in, the decision-making procedures related to the implementation of the obligations under this Directive, including non-governmental organisations promoting the protection of human health or the environment and meeting any requirements under national law;

(39) ‘sensitive population and vulnerable groups’ means those population groups that are more vulnerable to air pollution exposure than the average population, because they have a higher sensitivity or a lower threshold for health effects or have a reduced ability to protect themselves.

↓ 2008/50

Article 5~~3~~

Responsibilities

Member States shall designate at the appropriate levels the competent authorities and bodies responsible for the following:

(a) assessment of ambient air quality;

(b) approval of measurement systems (methods, equipment, networks and laboratories);

(c) ensuring the accuracy of measurements;

⇩ new

(d) ensuring the accuracy of modelling applications;

↓ 2008/50 (adapted)

(e~~c~~) analysis of assessment methods;

(f~~e~~) coordination on their territory if ~~Community-wide~~ ⌦ Union-wide ⌫ quality assurance programmes are being organised by the Commission;

(g~~f~~) cooperation with the other Member States and the Commission;~~.~~

⇩ new

(h) establishment of air quality plans;

(i) establishment of short-term action plans.

↓ 2008/50 (adapted)
⇨ new

~~Where relevant, the competent authorities and bodies shall comply with Section C Points E and F of Annex VI.~~

Article 6~~4~~

Establishment of zones ~~and agglomerations~~

Member States shall establish zones ~~and agglomerations~~ throughout their territory ⇨ , including, where appropriate for the purposes of air quality assessment and management, at the level of agglomerations ⇦ . Air quality assessment and air quality management shall be carried out in all zones ~~and agglomerations~~.

CHAPTER II

ASSESSMENT OF AMBIENT AIR QUALITY ⌦ AND DEPOSITION RATES ⌫

~~*SECTION 1*~~

~~***Assessment of ambient air quality in relation to sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter, lead, benzene and carbon monoxide***~~

Article 7 ~~5~~

Assessment regime

1. The ~~upper and lower~~ assessment thresholds specified in ~~Section A of~~ Annex II shall apply to sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM_{10} and $PM_{2.5}$), lead, benzene, ~~and~~ carbon monoxide ⌦ , arsenic, cadmium, nickel, benzo(a)pyrene and ozone in ambient air ⌫ .

Each zone ~~and agglomeration~~ shall be classified in relation to those assessment thresholds.

2. ⌦ Member States shall review ⌫ t~~T~~he classification referred to in paragraph 1 ~~shall be reviewed~~ at least every ⌦ 5 ⌫ ~~five~~ years in accordance with the procedure laid down in ⌦ this paragraph ⌫ ~~Section B of Annex II~~. However, classifications shall be reviewed more frequently in the event of significant changes in activities emitting air pollutants and modifying the result to the ambient concentrations of sulphur dioxide, nitrogen dioxide ⌦ and ⌫ ~~or, where relevant,~~ oxides of nitrogen, particulate matter (PM_{10} and $PM_{2.5}$), lead, benzene, ~~or~~ carbon monoxide ⌦ , arsenic, cadmium, nickel, benzo(a)pyrene or ozone ⌫ .

~~**B. Determination of exceedances of upper and lower assessment thresholds**~~

Exceedances of ~~upper and lower~~ ⌦ the ⌫ assessment thresholds shall be determined on the basis of concentrations during the previous ⌦ 5 ⌫ ~~five~~ years where sufficient data are available. An assessment threshold shall be deemed to have been exceeded if it has been exceeded during at least ⌦ 3 ⌫ ~~three~~ separate years out of those previous ⌦ 5 ⌫ ~~five~~ years.

Where ~~fewer~~ ⌦ data are available for less ⌫ than ⌦ 5 ⌫ ~~five~~ years~~' data are available~~, Member States may combine measurement campaigns of short duration during the period of the year and at locations likely to be typical of the highest pollution levels, with results obtained from information from emission inventories and modelling to determine exceedances of the ~~upper and lower~~ assessment thresholds.

Article 8~~6~~

Assessment criteria

1. Member States shall assess ambient air quality with respect to the pollutants referred to in Article 7~~5~~ in all their zones ~~and agglomerations~~, in accordance with the criteria laid down in paragraphs 2~~,~~ ~~3, and 4~~ ⇨ to 6 ⇦ of this Article and in accordance with ~~the criteria laid down in~~ Annex IV~~III~~.

2. In all zones ~~and agglomerations~~ where the level of pollutants ~~referred to in paragraph 1~~ exceeds the ~~upper~~ assessment threshold established for those pollutants, fixed measurements shall be used to assess the ambient air quality. Those fixed measurements may be supplemented by modelling ~~techniques~~ ⇨ applications ⇦ and~~/or~~ indicative measurements ⇨ to assess air quality and ⇦ to provide adequate information on the spatial distribution of ~~the ambient~~ air ⇨ pollutants ⇦ ~~quality~~ ⇨ and on the spatial representativeness of fixed measurements ⇦ .

3. In all zones ~~and agglomerations~~ where the level of pollutants ~~referred to in paragraph 1 is below the upper assessment threshold~~ ⇨ exceeds a limit value ⇦ established for those pollutants ⇨ in Table 1 of Section 1 of Annex I or an ozone target value established in Section 2 of Annex I ⇦ , ~~a combination of fixed measurements and~~ modelling ~~techniques~~ ⇨ applications ⇦ ~~and/or indicative measurements may~~ ⇨ shall ⇦ be used ⇨ in addition to fixed measurements ⇦ to assess the ambient air quality.

⇩ new

Those modelling applications shall also provide information on the spatial distribution of pollutants and on the spatial representativeness of fixed measurements.

🡻 2008/50 (adapted)
⇨ new

4. In all zones ~~and agglomerations~~ where the level of pollutants ~~referred to in paragraph 1~~ is below the ~~lower~~ assessment threshold established for those pollutants, modelling ~~techniques~~ ⇨ applications, indicative measurements, ⇦ ~~or~~ objective-estimation techniques, or ⇨ a combination thereof ⇦ ~~both~~ shall be sufficient for the assessment of the ambient air quality.

⇩ new

5. If modelling shows an exceedance of any limit value or ozone target value in an area of the zone not covered by fixed measurements, additional fixed or indicative measurements shall be used during at least 1 calendar year after the exceedance was recorded, to assess the concentration level of the relevant pollutant.

🡻 2004/107
⇨ new

~~*Article 4*~~

~~**Assessment of ambient air concentrations and deposition rates**~~

~~1. Ambient air quality with respect to arsenic, cadmium, nickel and benzo(a)pyrene shall be assessed throughout the territory of the Member States.~~

~~2. In accordance with the criteria referred to in paragraph 7, measurement is mandatory in the following zones:~~

~~(a) zones and agglomerations in which levels are between the upper and the lower assessment threshold, and~~

~~(b) other zones and agglomerations where levels exceed the upper assessment threshold.~~

~~The measurements provided for may be supplemented by modelling techniques to provide an adequate level of information on ambient air quality.~~

~~3. A combination of measurements, including indicative measurements as referred to in Annex IV, Section I, and modelling techniques may be used to assess ambient air quality in zones and agglomerations where the levels over a representative period are between the upper and lower assessment thresholds, to be determined pursuant to Annex II, Section II.~~

~~4. In zones and agglomerations where the levels are below the lower assessment threshold, to be determined pursuant to Annex II, Section II, the sole use of modelling or objective estimation techniques for assessing levels shall be possible.~~

~~5. Where pollutants have to be measured, the measurements shall be taken at fixed sites either continuously or by random sampling. The number of measurements shall be sufficient to enable the levels to be determined.~~

~~6. The upper and lower assessment thresholds for arsenic, cadmium, nickel and benzo(a)pyrene in ambient air shall be those laid down in Section I of Annex II. The classification of each zone or agglomeration for the purposes of this Article shall be reviewed at least every five years in accordance with the procedure laid down in Section II of Annex II. Classification shall be reviewed earlier in the event of significant change in activities relevant to concentrations of arsenic, cadmium, nickel and benzo(a)pyrene, in ambient air.~~

~~7. The criteria for determining the location of sampling points for the measurement of arsenic, cadmium, nickel and benzo(a)pyrene in ambient air in order to assess compliance with the target values shall be those listed in Sections I and II of Annex III. The minimum number of sampling points for fixed measurements of concentrations of each pollutant shall be as laid down in Section IV of Annex III, and they shall be installed in each zone or agglomeration within which measurement is required if fixed measurement is the sole source of data on concentrations within it.~~

6~~8~~. To assess the contribution of benzo(a)pyrene in ambient air, each Member State shall monitor other relevant polycyclic aromatic hydrocarbons at a limited number of ~~measurement sites~~ ⇨ sampling points ⇦ . These compounds shall include at least: benzo(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene. ~~Monitoring sites~~ ⇨ Sampling points ⇦ for these polycyclic aromatic hydrocarbons shall be co-located with sampling ⇨ points ⇦ ~~sites~~ for benzo(a)pyrene and shall be selected in such a way that geographical variation and long-term trends can be identified. ~~Sections I, II and III of Annex III shall apply.~~

⇩ new

7. In addition to monitoring required under Article 10, Member States shall, where applicable, monitor ultrafine particles levels in accordance with Point D of Annex III and Section 3 of Annex VII.

🡻 2008/50

~~5. In addition to the assessments referred to in paragraphs 2, 3 and 4, measurements shall be made, at rural background locations away from significant sources of air pollution, for the purposes of providing, as a minimum, information on the total mass concentration and the chemical speciation concentrations of fine particulate matter ($PM_{2,5}$) on an annual average basis and shall be conducted using the following criteria:~~

~~(a) one sampling point shall be installed every 100000 km^2;~~

~~(b) each Member State shall set up at least one measuring station or may, by agreement with adjoining Member States, set up one or several common measuring stations, covering the relevant neighbouring zones, to achieve the necessary spatial resolution;~~

~~(c) where appropriate, monitoring shall be coordinated with the monitoring strategy and measurement programme of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP);~~

~~(d) Sections A and C of Annex I shall apply in relation to the data quality objectives for mass concentration measurements of particulate matter and Annex IV shall apply in its entirety.~~

~~Member States shall inform the Commission of the measurement methods used in the measurement of the chemical composition of fine particulate matter ($PM_{2,5}$).~~

🡻 219/2009 Art. 1 and Annex .3(8) (adapted)

~~9. Irrespective of concentration levels, one background sampling point shall be installed every 100000 km2 for the indicative measurement, in ambient air, of arsenic, cadmium, nickel, total gaseous mercury, benzo(a)pyrene and the other polycyclic aromatic hydrocarbons referred to in paragraph 8, and of the total deposition of arsenic, cadmium, mercury, nickel, benzo(a)pyrene and the other polycyclic aromatic hydrocarbons referred to in paragraph 8. Each Member State shall set up at least one measuring station. However, Member States may, by agreement, and in accordance with guidelines to be drawn up under the regulatory procedure referred to in Article 6(2), set up one or several common measuring stations, covering neighbouring zones in adjoining Member States, to achieve the necessary spatial resolution. Measurement of particulate and gaseous divalent mercury is also recommended. Where appropriate, monitoring shall be coordinated with the European Monitoring and Evaluation of Pollutants (EMEP) monitoring strategy and measurement programme. The sampling sites for these pollutants shall be selected in such a way that geographical variation and long-term trends can be identified. Sections I, II and III of Annex III shall apply.~~

↓ 2004/107
⇨ new

8.~~10.~~ The use of bio indicators ~~may~~ ⇨ shall ⇦ be considered where regional patterns of the impact on ecosystems are to be assessed ⇨ , including in accordance with the monitoring undertaken under Directive (EU) 2016/2284 ⇦ .

~~11. For zones and agglomerations within which information from fixed measurement stations is supplemented by information from other sources, such as emission inventories, indicative measurement methods and air quality modelling, the number of fixed measuring stations to be installed and the spatial resolution of other techniques shall be sufficient for the concentrations of air pollutants to be established in accordance with Section I of Annex III and Section I of Annex IV.~~

~~12. Data quality objectives are laid down in Section I of Annex IV. Where air quality models are used for assessment, Section II of Annex IV shall apply.~~

~~13. The reference methods for the sampling and analysis of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air shall be as laid down in Sections I, II and III of Annex V. Section IV of Annex V sets out reference techniques for measuring the total deposition of arsenic, cadmium, mercury, nickel and the polycyclic aromatic hydrocarbons and Section V of Annex V refers to reference air quality modelling techniques when such techniques are available.~~

~~14. The date by which Member States shall inform the Commission of the methods used for the preliminary assessment of air quality under Article 11(1)(d) of Directive 96/62/EC shall be the date referred to in Article 10 of this Directive.~~

↓ 219/2009 Art. 1 and Annex .3(8)

~~15. Any amendments necessary to adapt the provisions of this Article and of Section II of Annex II and of Annexes III, IV and V to scientific and technical progress shall be adopted by the Commission. Those measures, designed to amend non-essential elements of this Directive, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 6(3). They may not result in any direct or indirect changes to target values.~~

↓ 2008/50 (adapted)
⇨ new

Article ~~9~~7

Sampling points

1. The location of sampling points for the measurement of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM_{10} and $PM_{2.5}$), lead, benzene, ~~and~~ carbon monoxide ⌦ , arsenic, cadmium, nickel, benzo(a)pyrene ⌫ in ambient air shall be determined ⌦ in accordance with ⌫ ~~using the criteria listed in~~ Annex IV~~III~~.

⌦ The location of sampling points for the measurement of ozone shall be determined in accordance with Annex IV. ⌫

2. In each zone ~~or agglomeration~~ where ⇨ the level of pollutants exceeds the assessment threshold specified in Annex II, ⇦ ~~fixed measurements are the sole source of information for assessing air quality,~~ the number of sampling points for each ~~relevant~~ pollutant shall not be less than the minimum number of sampling points specified in ~~Section A~~ Tables 3 and 4 of Points A and Point C, of Annex III~~V~~ .

3. For zones ~~and agglomerations~~ ⇨ where the level of pollutants exceeds the relevant assessment threshold specified in Annex II, but not the respective limit values specified in Table 1 of Section 1 of Annex I, ozone target values specified in Section 2 of Annex I or critical levels specified in Section 3 of Annex I ⇦ ~~within which information from fixed measurement sampling points is supplemented by information from modelling and/or indicative measurement~~, the ~~total~~ ⇨ minimum ⇦ number of sampling points ~~specified in Section A of Annex V~~ may be reduced by up to 50 %, ⇨ in accordance with Points A and C of Annex III ⇦ provided that the following conditions are met:

(a) ~~the supplementary methods~~ ⇨ indicative measurements and modelling ⇦ provide sufficient information for the assessment of air quality with regard to limit values ⇨ , ozone target values, critical levels, information thresholds and ⇦ ~~or~~ alert thresholds, as well as adequate information for the public ⇨ , in addition to the one provided by the fixed sampling points ⇦;

(b) the number of sampling points to be installed and the spatial resolution of ~~other~~ ⇨ indicative measurements and modelling ⇦ techniques are sufficient for the concentration of the relevant pollutant to be established in accordance with the data quality objectives specified in ~~Section~~ Points A and B of Annex V~~I~~ and enable assessment results to meet the ~~criteria~~ ⌦ requirements ⌫ specified in Point D~~B~~ of Annex V;~~I~~

⇩ new

(c) the number of indicative measurements is the same as the number of fixed measurements that are being replaced and the indicative measurements have a minimum duration of 2 months per calendar year;

(d) for ozone, nitrogen dioxide is measured at all remaining sampling points measuring ozone except at rural background locations for ozone assessment as referred to in Point B of Annex IV.

4. One or more sampling points adapted to the monitoring objective specified in Section 2, Point A of Annex VII, shall be installed in a Member State's territory to supply data on concentrations of the ozone precursor substances listed in Point B of that Section at locations determined in accordance with Point C of that Section.

🡻 2008/50 (adapted)
⇨ new

5.~~4.~~ Each Member State shall, in accordance with Annex IV~~III~~, ensure that the distribution ~~and the number of sampling points on which~~ ⌦ used for the calculation of ⌫ the average exposure ~~indicator~~ ⌦ indicators ⌫ for $PM_{2.5}$ ⇨ and NO_2, ⇦ ~~is based~~ reflect the general population exposure adequately. The number of sampling points shall be no less than that determined by application of Point~~Section~~ B, of Annex III~~V~~.

6. The results of modelling ⇨ applications ⇦ and~~/or~~ indicative ~~measurement~~ ⌦ measurements ⌫ shall be taken into account for the assessment of air quality with respect to the limit values ⇨ and ozone target values ⇦ .

⇩ new

7. Sampling points at which exceedances of any limit value specified in Section 1 of Annex I were recorded within the previous 3 years shall not be relocated, unless a relocation is necessary due to special circumstances, including spatial development. Relocation of sampling points shall be done within their area of spatial representativeness and be based on modelling results.

🡻 2008/50

~~4. The application in Member States of the criteria for selecting sampling points shall be monitored by the Commission so as to facilitate the harmonised application of those criteria throughout the European Union.~~

⇩ new

Article 10

Monitoring supersites

1. Each Member State shall establish at least one monitoring supersite per 10 million inhabitants at an urban background location. Member States that have fewer than 10 million inhabitants shall establish at least one monitoring supersite at an urban background location.

Each Member State shall establish at least one monitoring supersite per 100 000 km^2 at a rural background location. Member States whose territory is less than 100 000 km^2 shall establish at least one monitoring supersite at a rural background location.

2. The siting of monitoring supersites shall be determined for urban background locations and rural background locations in accordance with Point B of Annex IV.

3. All sampling points that fulfil the requirements laid down in Point B and C of Annex IV and which are installed at monitoring supersites may be taken into account for the purpose of meeting the requirements on the minimum number of sampling points for the relevant pollutants as specified in Annex III.

4. A Member State may set up in agreement with one or more neighbouring Member States to establish one or more joint monitoring supersites to meet the requirements set out in paragraph 1. This does not affect the obligation of each Member State to establish at least 1 monitoring supersite at an urban background location and 1 monitoring supersite at a rural background location.

5. Measurements at all monitoring supersites at urban background locations shall include fixed or indicative measurements of size distribution of ultrafine particles and particulate matter oxidative potential.

6. Measurements at all monitoring supersites at urban background locations and rural background locations shall include at least the following:

(a) fixed measurements of particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), ozone (O_3), black carbon (BC), ammonia (NH_3) and ultrafine particles (UFP).

(b) fixed or indicative measurements of fine particulate matter ($PM_{2.5}$) for the purposes of providing, as a minimum, information on their total mass concentration and their chemical speciation concentrations on an annual average basis in accordance with Section 1 of Annex VII;

(c) fixed or indicative measurements of arsenic, cadmium, nickel, total gaseous mercury, benzo(a)pyrene and the other polycyclic aromatic hydrocarbons referred to in Article 8(6), and of the total deposition of arsenic, cadmium, mercury, nickel, benzo(a)pyrene and the other polycyclic aromatic hydrocarbons referred to in Article 8(6), irrespective of concentration levels.

7. Measurements of particulate and gaseous divalent mercury may also be undertaken at monitoring supersites at urban background locations and rural background locations.

↓ 2008/50 (adapted)
⇨ new

8.~~(c)~~ Where appropriate, monitoring shall be coordinated with the monitoring strategy and measurement programme of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) ⇨ , the Aerosol, Clouds and Trace Gases Research Infrastructure (ACTRIS), and the monitoring of air pollution impacts undertaken under Directive (EU) 2016/2284 ⇦ .

Article11 ~~8~~

Reference measurement methods ⌦ and data quality objectives ⌫

1. Member States shall apply the reference measurement methods ~~and criteria~~ specified in ~~Section A and Section C~~ Points A and C of Annex VI.

~~2.~~ ⌦ However, ⌫ o~~O~~ther measurement methods may be used subject to the conditions set out in Points~~Section~~ B, C, D and E~~,~~ of Annex VI.

⇩ new

2. Air quality data shall meet the data quality objectives laid down in Annex V.

↓ 2008/50 (adapted)
⇨ new

~~SECTION 2~~

~~Assessment of ambient air quality in relation to ozone~~

~~*Article 9*~~

~~**Assessment criteria**~~

~~1. Where, in a zone or agglomeration, concentrations of ozone have exceeded the long-term objectives specified in Section C of Annex VII during any of the previous five years of measurement, fixed measurements shall be taken.~~

2. Where fewer than five years' data are available, Member States may, for the purposes of determining whether the long-term objectives referred to in paragraph 1 have been exceeded during those five years, combine the results from measurement campaigns of short duration carried out when and where levels are likely to be at their highest, with the results obtained from emission inventories and modelling.

Article 10

Sampling points

1. The siting of sampling points for the measurement of ozone shall be determined using the criteria set out in Annex VIII.

2. The sampling points for fixed measurements of ozone in each zone or agglomeration within which measurement is the sole source of information for assessing air quality shall not be less than the minimum number of sampling points specified in Section A of Annex IX.

3. For zones and agglomerations within which information from sampling points for fixed measurements is supplemented by information from modelling and/or indicative measurements, the number of sampling points specified in Section A of Annex IX may be reduced provided that the following conditions are met:

(a) the supplementary methods provide sufficient information for the assessment of air quality with regard to target values, long-term objectives, information and alert thresholds;

(b) the number of sampling points to be installed and the spatial resolution of other techniques are sufficient for the concentration of ozone to be established in accordance with the data quality objectives specified in Section A of Annex I and enable assessment results to meet the criteria specified in Section B of Annex I;

(c) the number of sampling points in each zone or agglomeration amounts to at least one sampling point per two million inhabitants or one sampling point per 50000 km^2, whichever produces the greater number of sampling points, but must not be less than one sampling point in each zone or agglomeration;

(d) nitrogen dioxide is measured at all remaining sampling points except at rural background stations as referred to in Section A of Annex VIII.

The results of modelling and/or indicative measurement shall be taken into account for the assessment of air quality with respect to the target values.

5. In zones and agglomerations where, during each of the previous five years of measurement, concentrations are below the long-term objectives, the number of sampling points for fixed measurements shall be determined in accordance with Section B of Annex IX.

6. Each Member State shall ensure that at least one sampling point is installed and operated in its territory to supply data on concentrations of the ozone precursor substances listed in Annex X. Each Member State shall choose the number and siting of the stations at which ozone precursor substances are to be measured, taking into account the objectives and methods laid down in Annex X.

Article 11

Reference measurement methods

1. Member States shall apply the reference method for measurement of ozone, set out in point 8 of Section A of Annex VI. Other measuring methods may be used subject to the conditions set out in Section B of Annex VI.

~~2. Each Member State shall inform the Commission of the methods it uses to sample and measure VOC, as listed in Annex X.~~

CHAPTER III

AMBIENT AIR QUALITY MANAGEMENT

Article 12

Requirements where levels are lower than the limit values ⌦ , ozone target value and average exposure concentration objectives, but above the assessment thresholds ⌫

1. In zones ~~and agglomerations~~ where the levels of sulphur dioxide, nitrogen dioxide, ⌦ particulate matter (⌫ PM_{10} and $PM_{2.5}$), lead, benzene, ~~and~~ carbon monoxide ⇨ , arsenic, cadmium, nickel and benzo(a)pyrene ⇦ in ambient air are below the respective limit values specified in Section 1 of Annex I ~~Annexes XI and XIV~~, Member States shall maintain the levels of those pollutants below the limit values ~~and shall endeavour to preserve the best ambient air quality, compatible with sustainable development~~.

~~*Article 18*~~

~~**Requirements in zones and agglomerations where ozone concentrations meet the long-term objectives**~~

2. In zones ~~and agglomerations~~ in which ozone levels ⇨ are below the ozone target value ⇦ ~~meet the long-term objectives,~~ Member States shall ⇨ take necessary measures to maintain those levels below the ozone target value and endeavour to attain the long-term objectives specified in Section 2 of Annex I ⇦ , in so far as factors including the transboundary nature of ozone pollution and meteorological conditions ⌦ so ⌫ permit, ⇨ and provided that any necessary measures do not entail a disproportionate cost.⇦ ~~maintain those levels below the long-term objectives.~~

⇩ new

3. In territorial units at NUTS 1 level as described in Regulation (EC) No 1059/2003 where the average exposure indicators for $PM_{2.5}$ and NO_2 are below the respective value of the average exposure concentration objectives for those pollutants as laid down in Section 5 of Annex I, Member States shall maintain the levels of those pollutants below the average exposure concentration objectives.

🡻 2008/50 (adapted)
⇨ new

4. ~~and~~ ⌦ Member States ⌫ shall ⇨ endeavour to achieve and ⇦ preserve ~~through proportionate measures~~ the best ambient air quality ~~compatible with sustainable development~~ and a high level of environmental and human health protection ⇨ , in line with the air quality guidelines published by the WHO and below the assessment thresholds laid down in Annex II ⇦ .

Article 13

Limit values, ⌦ ozone target values ⌫ and ⌦ average exposure reduction obligation ⌫ ~~lert thresholds~~ for the protection of human health

1. Member States shall ensure that, throughout their zones ~~and agglomerations~~, levels of sulphur dioxide, ⇨ nitrogen dioxide, particulate matter (⇦ PM_{10}, ⇨ and $PM_{2.5}$), ⇦ lead, ⇨ benzene, ⇦ ~~and~~ carbon monoxide ⇨ , arsenic, cadmium, nickel and benzo(a)pyrene⇦ in ambient air, do not exceed the limit values laid down in Section 1 of Annex I~~XI~~.

~~In respect of nitrogen dioxide and benzene, the limit values specified in Annex XI may not be exceeded from the dates specified therein.~~

~~*Article 17*~~

~~**Requirements in zones and agglomerations where ozone concentrations exceed the target values and long-term objectives**~~

2.~~1.~~ ⇨ For ozone, ⇦ Member States shall ⌦ ensure, by taking ⌫ ~~take~~ all necessary measures not entailing disproportionate costs, ~~to ensure~~ that ⌦ throughout the zone levels do not exceed ⌫ the ⇨ ozone ⇦ target values ~~and long-term objectives are attained~~ ⌦ , as laid down in Section 2, Point B, of Annex I ⌫ .

~~*Article 15*~~

~~**National $PM_{2,5}$ exposure reduction target for the protection of human health**~~

3~~1~~. Member States shall ⌦ ensure that ⌫ ~~take all necessary measures not entailing disproportionate costs to reduce exposure to $PM_{2,5}$ with a view to attaining~~ the ~~national~~ ⇨ average ⇦ exposure reduction ~~target~~ ⇨ obligations for $PM_{2.5}$ and NO_2 ⇦ laid down in ⌦ Section 5, Point B, of Annex I, ⌫ ~~Section B of Annex XIV~~ ⇨ are met throughout their territorial units at NUTS 1 level, where they exceed the average exposure concentration objectives set out in Section 5, Point C, of Annex I. ⇦ ~~by the year specified therein.~~

4. Compliance with ~~these requirements~~ ⌦ paragraphs 1, 2 and 3 ⌫ shall be assessed in accordance with Annex IV ~~Annex III~~.

5. The average exposure ~~indicator~~ ⌦ indicators ⌫ ~~for $PM_{2,5}$~~ shall be assessed in accordance with Section 5, Point A, of Annex I~~XIV~~.

6. The ⇨ deadline for attaining the limit values ⇦ ~~margins of tolerance~~laid down in Table 1 of Section 1 of Annex I~~XI~~ ~~shall apply~~ ⇨ may be postponed ⇦ in accordance with Article 18~~(3) and Article 23(1)~~.

⇩ new

7. Member States that introduce more stringent air quality standards, in accordance with Article 193 TFEU, shall notify them to the Commission within 3 months after their adoption. Such notification shall be accompanied by an explanation on the process of how those air quality standards have been established and the scientific information used.

↓ 2008/50 (adapted)

Article 14

Critical levels ⌦ for the protection of vegetation and natural ecosystems ⌫

~~1.~~ Member States shall ensure compliance with the critical levels specified in Section 3 of Annex I~~X~~III as assessed in accordance with ~~Section~~Point A, of Annex IV~~II~~I.

~~2. Where fixed measurements are the sole source of information for assessing air quality, the number of sampling points shall not be less than the minimum number specified in Section C of Annex V. Where that information is supplemented by indicative measurements or modelling, the minimum number of sampling points may be reduced by up to 50 % so long as the assessed concentrations of the relevant pollutant can be established in accordance with the data quality objectives specified in Section A of Annex I.~~

↓ 2004/107

~~*Article 3*~~

~~**Target values**~~

~~1. Member States shall take all necessary measures not entailing disproportionate costs to ensure that, as from 31 December 2012, concentrations of arsenic, cadmium, nickel and benzo(a)pyrene, used as a marker for the carcinogenic risk of polycyclic aromatic hydrocarbons, in ambient air, as assessed in accordance with Article 4, do not exceed the target values laid down in Annex I.~~

~~2. Member States shall draw up a list of zones and agglomerations in which the levels of arsenic, cadmium, nickel, and benzo(a)pyrene are below the respective target values. Member States shall maintain the levels of these pollutants in these zones and agglomerations below the respective target values and shall endeavour to preserve the best ambient air quality, compatible with sustainable development.~~

~~3. Member States shall draw up a list of the zones and agglomerations where the target values laid down in Annex I are exceeded.~~

~~For such zones and agglomerations, Member States shall specify the areas of exceedance and the sources contributing thereto. In the areas concerned, Member States shall demonstrate the application of all necessary measures not entailing disproportionate costs, directed in particular at the predominant emission sources, in order to attain the target values. In the case of industrial installations covered by Directive 96/61/EC this means the application of BAT as defined by Article 2(11) of that Directive.~~

↓ 2008/50 (adapted)
⇨ new

~~*Article 16*~~

~~**$PM_{2,5}$ target value and limit value for the protection of human health**~~

~~1. Member States shall take all necessary measures not entailing disproportionate costs to ensure that concentrations of $PM_{2,5}$ in ambient air do not exceed the target value laid down in Section D of Annex XIV as from the date specified therein.~~

~~2. Member States shall ensure that concentrations of $PM_{2,5}$ in ambient air do not exceed the limit value laid down in Section E of Annex XIV throughout their zones and agglomerations as from the date specified therein. Compliance with this requirement shall be assessed in accordance with Annex III.~~

~~3. The margin of tolerance laid down in Section E of Annex XIV shall apply in accordance with Article 23(1).~~

Article 15~~19~~

~~Measures required in the event of information or~~ ⌦ Exceedances of ⌫ alert ⌦ or information ⌫ thresholds ~~being exceeded~~

1~~2.~~ The alert thresholds for concentrations of sulphur dioxide, ~~and~~ nitrogen dioxide ⇨ , and particulate matter (PM_{10} and $PM_{2.5}$) ⇦ in ambient air shall be those laid down in Section 4, Point A of Annex I~~XII~~.

⇩ new

2. The alert threshold and information threshold for ozone shall be that laid down in Section 4, Point B, of Annex I.

🡻 2008/50 (adapted)
⇨ new

3. Where ~~the information threshold specified in Annex XII or~~ any ~~of the~~ alert ~~thresholds~~ ⌦ threshold or any information threshold ⌫ laid down ⌦ in Section 4 of Annex I ⌫ ~~therein~~ is exceeded, Member States shall take the necessary steps to inform the public ⇨ within a few hours at the latest, making use of different media and communication channels and ensuring broad public access ⇦ ~~means of radio, television, newspapers or the Internet~~.

⇩ new

4. Member States shall ensure that information about actual or predicted exceedances of any alert threshold or information threshold is provided to the public as soon as possible in accordance with, points 2 and 3 of Annex IX.

🡻 2008/50 (adapted)
⇨ new

Article 16~~20~~

Contributions from natural sources

1. Member States ⇨ may ⇦ ~~shall transmit to the Commission~~, for a given year, ~~lists of~~ ⇨ identify ⇦ :

(a)~~-~~ zones ~~and agglomerations~~ where exceedances of limit values for a given pollutant are attributable to natural sources;⌦ and ⌫

⇩ new

(b) NUTS 1 territorial units where exceedances of the level determined by the average exposure reduction obligations are attributable to natural sources.

🡻 2008/50 (adapted)
⇨ new

2. Member States shall provide ⇨ the Commission with lists of any such zones and NUTS 1 territorial units, as referred to in paragraph 1, together with ⇦ information on concentrations and sources and the evidence demonstrating that the exceedances are attributable to natural sources.

3~~2~~. Where the Commission has been informed of an exceedance attributable to natural sources in accordance with paragraph 2~~1~~, that exceedance shall not be considered as an exceedance for the purposes of this Directive.

~~3. The Commission shall by 11 June 2010 publish guidelines for demonstration and subtraction of exceedances attributable to natural sources.~~

Article 17~~21~~

Exceedances attributable to winter-sanding or ⌦ winter ⌫ -salting of roads

1. Member States may ⇨ , for a given year, ⇦ ~~designate~~ ⌦ identify ⌫ zones ~~or agglomerations~~ within which limit values for PM_{10} are exceeded in ambient air due to the re-suspension of particulates following winter-sanding or ⌦ winter ⌫ -salting of roads.

2. Member States shall ⌦ provide ⌫ ~~send~~ the Commission ⌦ with ⌫ lists of any such zones ⇨ , as referred to in paragraph 1 ⇦ ~~or agglomerations~~ together with information on concentrations and sources of PM_{10} ⇨ in such zones. ⇦ ~~therein.~~

~~3. When informing the Commission in accordance with Article 27,~~ Member States shall ⌦ also ⌫ provide the ~~necessary~~ evidence ~~to demonstrate~~ ⌦ demonstrating ⌫ that any exceedances are due to re-suspended particulates and that reasonable measures have been taken to lower ⌦ such ⌫ ~~the~~ concentrations.

3~~4~~. Without prejudice to Article 16~~20~~, in the case of zones ~~and agglomerations~~ referred to in paragraph 1 of this Article, Member States need to establish the air quality plan provided for in Article 19~~22~~ only in so far as exceedances are attributable to PM_{10} sources other than winter-sanding or ⌦ winter ⌫ -salting of roads.

~~5. The Commission shall by 11 June 2010 publish guidelines for determination of contributions from the re-suspension of particulates following winter-sanding or -salting of roads.~~

Article 18~~22~~

Postponement of attainment ⇨ deadline ⇦ and exemption from the obligation to apply certain limit values

1. Where, in a given zone ~~or agglomeration~~, conformity with the limit values for ⇨ particulate matter (PM_{10} and $PM_{2.5}$) or ⇦ nitrogen dioxide ~~or benzene~~ cannot be achieved by the ⌦ deadline ⌫ ~~deadlines~~ specified in Table 1 of Section 1 of Annex I~~XI~~, ⇨ because of site-specific dispersion characteristics, orographic boundary conditions, adverse climatic

conditions or transboundary contributions, ⇦ a Member State may postpone ~~those deadlines~~ - ⇨ that deadline once ⇦ by a maximum of ⌦ 5 ⌫ ~~five~~ years for that particular zone ~~or agglomeration~~, ~~on condition~~ ⌦ if the following conditions are met: ⌫

🡻 2008/50 (adapted)
⇨ new

(a) ~~that~~ an air quality plan is established in accordance with Article 19(4) ⌦ and meeting the requirements listed in Article 19(5) to (7) ⌫ ~~of Article 23~~ for the zone ~~or agglomeration~~ to which the postponement would apply;

(b) ⌦ the ⌫ ~~such~~ air quality plan ⌦ referred in point (a) is ⌫ ~~shall be~~ supplemented by the information listed in Point B of Annex VIII~~XV~~ related to the pollutants concerned and ~~shall demonstrate~~ ⌦ demonstrates ⌫ how ⇨ exceedance periods above the limit values will be kept as short as possible ⇦ ~~conformity will be achieved with the limit values before the new deadline~~;.

⇩ new

(c) the air quality plan referred to in point (a) outlines how the public and, in particular, sensitive population and vulnerable groups will be informed about the consequences of the postponement for human health and the environment;

(d) the air quality plan referred to in point (a) outlines how additional funding, including via relevant national and Union funding programmes, will be mobilised to accelerate the improvement of air quality in the zone to which the postponement would apply;

🡻 2008/50 (adapted)
⇨ new

~~2. Where, in a given zone or agglomeration, conformity with the limit values for PM_{10} as specified in Annex XI cannot be achieved because of site-specific dispersion characteristics, adverse climatic conditions or transboundary contributions, a Member State shall be exempt from the obligation to apply those limit values until 11 June 2011 provided that the conditions laid down in paragraph 1 are fulfilled and that the Member State shows that all appropriate measures have been taken at national, regional and local level to meet the deadlines.~~

~~3. Where a Member State applies paragraphs 1 or 2, it shall ensure that the limit value for each pollutant is not exceeded by more than the maximum margin of tolerance specified in Annex XI for each of the pollutants concerned.~~

2~~4~~. Member States shall notify the Commission where, in their view, paragraph~~paragraphs~~ 1 ~~or 2~~ ⌦ is ⌫ ~~are~~ applicable, and shall communicate the air quality plan referred to in paragraph 1 ~~including~~ ⌦ and ⌫ all relevant information necessary for the Commission to assess whether ~~or not~~ ⇨ the invoked reason for postponement and ⇦ the ~~relevant~~ conditions ⌦ set out in that paragraph ⌫ are satisfied. In its assessment, the Commission shall take into account estimated effects on ambient air quality in ~~the~~ Member States, at present and in the future, of measures that have been taken by ~~the~~ Member States as well as estimated effects on ambient air quality of ~~current Community~~ ⌦ Union ⌫ measures ~~and planned Community measures to be proposed by the Commission~~.

Where the Commission has raised no objections within ⌦ 9 ⌫ ~~nine~~ months of receipt of that notification, the relevant conditions for the application of paragraph~~paragraphs~~ 1 ~~or 2~~ shall be deemed to be satisfied.

If objections are raised, the Commission may require Member States to adjust or provide new air quality plans.

CHAPTER IV

PLANS

Article 19~~23~~

Air quality plans

1. Where, in given zones ~~or agglomerations,~~ the levels of pollutants in ambient air exceed any limit value ⇨, laid down in Section 1 of Annex I, ⇦ ~~or target value, plus any relevant margin of tolerance in each case~~, Member States shall ⌦ establish ⌫ ~~ensure that~~ air quality plans ~~are established~~ for those zones ~~and agglomerations~~ ⇨ as soon as possible and no later than 2 years after the calendar year during which that exceedance of any limit value was recorded. Those air quality plans shall set out appropriate measures ⇦ ~~in order~~ to achieve the ⌦ concerned ⌫ ~~related~~ limit value ~~or target value specified in Annexes XI and XIV.~~ ⇨ and to keep the exceedance period as short as possible, and in any case no longer than 3 years from the end of the calendar year in which the first exceedance was reported .⇦

⇩ new

Where exceedances of any limit values persist during the third calendar year after the establishment of the air quality plan, Member States shall update the air quality plan and the measures therein, and take additional and more effective measures, in the subsequent calendar year to keep the exceedance period as short as possible.

2. Where in a given NUTS 1 territorial unit, the levels of pollutants in ambient air exceed the ozone target value, laid down in Section 2 of Annex I, Member States shall establish air quality plans for those NUTS 1 territorial units as soon as possible and no later than 2 years after the calendar year during which the exceedance of the ozone target value was recorded. Those air quality plans shall set out appropriate measures in order to achieve the ozone target value and to keep the exceedance period as short as possible.

Where exceedances of the ozone target value persist during the fifth calendar year after the establishment of the air quality plan in the relevant NUTS 1 territorial unit, Member States shall update air quality plan and the measures therein, and take additional and more effective measures, in the subsequent calendar year to keep the exceedance period as short as possible.

For NUTS 1 territorial units where the ozone target value is exceeded, Member States shall ensure that the relevant national air pollution control programme prepared pursuant to Article 6 of Directive (EU) 2016/2284 includes measures addressing those exceedances.

3. Where in a given NUTS 1 territorial unit, the average exposure reduction obligation laid down in Section 5 of Annex I is exceeded, Member States shall establish air quality plans for those NUTS 1 territorial units as soon as possible and no later than 2 years after the calendar year during which the exceedance of the average exposure reduction obligation was recorded. Those air quality plans shall set out appropriate measures to achieve the average exposure reduction obligation and to keep the exceedance period as short as possible.

Where exceedances of the average exposure reduction obligation persist during the fifth calendar year after the establishment of the air quality plan, Member States shall update the air quality plan and the measures therein, and take additional and more effective measures, in the subsequent calendar year to keep the exceedance period as short as possible.

4. Where from [insert year 2 years after entry into force of this Directive], until 31 December 2029 in a zone or NUTS 1 territorial unit, the levels of pollutants are above any limit value to be attained by 1 January 2030 as laid down in Table 1 of Section 1 of Annex I, Member States shall establish an air quality plan for the concerned pollutant as soon as possible and no later than 2 years after the calendar year during which the exceedance of the was recorded to attain the respective limit values or ozone target value by the expiration of the attainment deadline.

Where, for the same pollutant, Member States are required to establish an air quality plan in accordance with this paragraph as well as an air quality plan in accordance with Article 19(1), they may establish a combined air quality plan in accordance with Article 19(5), (6) and (7) and provide information on the expected impact of measures to reach compliance for each limit value it addresses, as required by in Annex VIII, points 5 and 6. Any such combined air quality plan shall set out appropriate measures to achieve all related limit values and to keep all exceedance periods as short as possible.

5. Air quality plans shall contain at least the following information:

(a) the information listed in Point A, points 1 to 6 of Annex VIII;

(b) where applicable, the information listed in Point A, points 7 and 8, of Annex VIII;

(c) where appropriate, information on abatement measures listed in Point B, Point 2 of Annex VIII.

↓ 2008/50 (adapted)
⇨ new

⇨ Member States shall consider including measures referred to in Article 20(2) and ⇦ ~~The air quality plans may additionally include~~ specific measures aiming at the protection of sensitive population ⇨ and vulnerable ⇦ groups , including children ⌦ in their air quality plans ⌫.

⇩ new

Regarding the pollutants concerned, when preparing air quality plans, Member States shall assess the risk of exceeding the respective alert thresholds. That analysis shall be used for establishing short-term action plans where applicable.

↓ 2008/50 (adapted)
⇨ new

Where air quality plans ~~must~~ ⌦ shall be established ⌫ ~~be prepared or implemented~~ in respect of several pollutants ⌦ or air quality standards ⌫, Member States shall, where appropriate, ~~prepare and implement~~ ⌦ establish ⌫ integrated air quality plans covering all pollutants ⇨ and air quality standards ⇦ concerned.

~~2~~. Member States shall, to the extent feasible, ensure consistency of their air quality plans with other plans ⇨ that have a significant impact on air quality, including those ⇦ required under Directive ~~2001/80/EC~~ 2010/75/ EU of the European Parliament and of the Council[78], Directives (EU) 2016/2284~~,~~ ~~2001/81/EC~~ ~~or~~ ⌦ and ⌫ 2002/49/EC ⇨ and under climate, energy, transport and agriculture legislation ⇦ .

⇩ new

6. Member States shall consult the public, in accordance with Directive 2003/35/EC of the European Parliament and of the Council[79], and the competent authorities, which, by reason of their responsibilities in the field of air pollution and air quality, are likely to be concerned by the implementation of the air quality plans, on draft air quality plans and any significant updates of air quality plans prior to their finalisation.

When preparing air quality plans, Member States shall ensure that stakeholders whose activities contribute to the exceedance situation are encouraged to propose measures they are able to take to help end the exceedances and that non-governmental organisations, such as environmental organisations, consumer organisations, organisations representing the interests of sensitive population and vulnerable groups, other relevant health-care bodies and the relevant industrial federations are allowed to take part in those consultations.

⇩ 2008/50 (adapted)
⇨ new

7. ~~Those~~ ⌦ Air quality ⌫ plans shall be communicated to the Commission ⇨ within 2 months after their adoption ⇦ ~~without delay, but no later than two years after the end of the year the first exceedance was observed~~.

Article 20~~2~~24

Short-term action plans

1. Where, in a given zone ~~or agglomeration~~, there is a risk that the levels of pollutants will exceed one or more of the alert thresholds specified in Section 4 of Annex I~~XII~~, Member States shall draw up ⌦ short-term ⌫ action plans indicating the ⇨ emergency ⇦ measures to be taken in the short term in order to reduce the risk or duration of such an exceedance. ~~Where this risk applies to one or more limit values or target values specified in Annexes VII, XI and XIV, Member States may, where appropriate, draw up such short-term action plans.~~

However, where there is a risk that the alert threshold for ozone Member States ~~shall only draw~~ ⇨ may refrain from drawing ⇦ up such short-term action plans when ~~in their opinion~~ there is ⇨ no ⇦ ~~a~~ significant potential, taking into account national geographical, meteorological and economic conditions, to reduce the risk, duration or severity of such an exceedance. ~~When drawing up such a short-term action plan Member States shall take account of Decision 2004/279/EC.~~

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[78] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (OJ L 334, 17.12.2010, p. 17).

[79] Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC (OJ L 156, 25.6.2003, p. 17).

2. ⌦ When drawing up the ⌫ ~~The~~ short-term action plans referred to in paragraph 1 ⌦ Member States ⌫ may, depending on the individual case, provide for effective measures to control and, where necessary, ⇨ temporarily ⇦ suspend activities which contribute to the risk of the respective limit values or target values or alert threshold being exceeded. ~~Those~~ ⇨ Depending on the share of the main pollution sources to the exceedances to be addressed, those short-term ⇦ action plans ⇨ shall consider including ⇦ ~~may include~~ measures in relation to ⇨ transport ⇦ ~~motor vehicle traffic~~, construction works, ~~ships at berth, and the use of~~ industrial ⇨ installations ⇦ ~~plants or~~ ⇨ and the use of ⇦ products and domestic heating. Specific actions aiming at the protection of sensitive population ⇨ and vulnerable ⇦ groups, including children, ⇨ shall ⇦ ~~may~~ also be considered in the framework of those plans.

⇩ new

3. Member States shall consult the public in accordance with Directive 2003/35/EC, and the competent authorities, which, by reason of their responsibilities in the field of air pollution and air quality, are likely to be concerned by the implementation of the short-term action plan, on draft short-term action plans and any significant updates thereof prior to their finalisation.

🡻 2008/50
⇨ new

~~4~~3. When Member States have drawn up a short-term action plan, they shall make available to the public and to appropriate organisations such as environmental organisations, consumer organisations, organisations representing the interests of sensitive population ⇨ and vulnerable ⇦ groups, other relevant health-care bodies and the relevant industrial federations both the results of their investigations on the feasibility and the content of specific short-term action plans as well as information on the implementation of these plans.

⇩ new

5. Member States shall submit short-term action plans to the Commission within 2 months after their adoption.

🡻 2008/50 (adapted)
⇨ new

~~4. For the first time before 11 June 2010 and at regular intervals thereafter, the Commission shall publish examples of best practices for the drawing-up of short-term action plans, including examples of best practices for the protection of sensitive population groups, including children.~~

Article ~~21~~25

Transboundary air pollution

1. Where ⇨ transboundary transport of air pollution from one or more Member State contributes significantly to the exceedance of ⇦ any ~~alert threshold,~~ limit value, ~~or~~ ⌦ ozone ⌫ target value, ~~plus any relevant margin of tolerance~~ ⇨ average exposure reduction obligation or ⇦ ⌦ alert threshold ⌫ ~~or long-term objective is exceeded due to significant transboundary transport of air pollutants or their precursors,~~ ⇨ in another Member

State, the latter shall notify the Member States from which the air pollution originated and the Commission thereof. ⇦

T~~t~~he Member States concerned shall cooperate ⇨ to identify the sources of air pollution and the measures to be taken to address those sources, ⇦ and~~, where appropriate,~~ draw up joint activities, such as the preparation of joint or coordinated air quality plans pursuant to Article 19~~23~~, in order to remove such exceedances ~~through the application of appropriate but proportionate measures~~.

⇩ new

Member States shall respond to each other in a timely manner, and no later than 3 months after being notified by another Member State in accordance with the first subparagraph.

🡻 2008/50 (adapted)
⇨ new

2. The Commission shall be ⇨ informed of, and ⇦ invited to be present and to assist in any cooperation referred to in paragraph 1 ⌦ of this Article ⌫ . Where appropriate, the Commission shall, taking into account the reports established pursuant to Article 11~~9~~ of Directive (EU) 2016/2284 ~~2001/81/EC~~, consider whether further action shall be taken at ~~Community~~ ⌦ Union ⌫ level in order to reduce precursor emissions responsible for transboundary pollution.

3. Member States shall, if appropriate pursuant to Article 20~~24~~, prepare and implement joint short-term action plans covering neighbouring zones in other Member States. Member States shall ensure that neighbouring zones in other Member States ~~which have developed short-term action plans~~ receive all appropriate information ⇨ regarding these short-term action plans without undue delay ⇦ .

4. Where the information threshold or alert thresholds are exceeded in zones ~~or agglomerations~~ close to national borders, information ⌦ on these exceedances ⌫ shall be provided as soon as possible to the competent authorities in the neighbouring Member States concerned. That information shall also be made available to the public.

5. In drawing up plans as provided for in paragraphs 1 and 3 and in informing the public as referred to in paragraph 4, Member States shall, where appropriate, endeavour to pursue cooperation with third countries, and in particular with candidate countries.

CHAPTER V

INFORMATION AND REPORTING

Article 22~~26~~

Public information

1. Member States shall ensure that the public as well as appropriate organisations such as environmental organisations, consumer organisations, organisations representing the interests of sensitive populations ⇨ and vulnerable groups ⇦ , other relevant health-care bodies and the relevant industrial federations are informed, adequately and in good time, of the following:

(a) ~~ambient~~ air quality in accordance with Annex points 1 and 3 of IX~~XVI~~;

↓ 2008/50
⇨ new

(b) any postponement decision~~s~~ pursuant to Article 18~~22(1)~~;

~~(c) any exemptions pursuant to Article 22(2);~~

~~(c)~~ ~~(d)~~ air quality plans as provided for in Article ~~22(1)~~ ~~and~~ 19;~~23~~ ~~and programmes referred to in Article 17(2).~~

⇩ new

(d) short-term action plans as provided for in Article 20;

↓ 2008/50 (adapted)
⇨ new

~~(e) 2. Member States shall make available to the public annual reports for all pollutants covered by this Directive.~~

~~Those reports shall summarise the levels exceeding limit values, target values, long-term objectives, information thresholds and alert thresholds, for the relevant averaging periods. That information shall be combined with a summary assessment of~~ the effects of ~~those~~ exceedances ⇨ of limit values, ozone target values, average exposure reduction obligations, information thresholds and alert thresholds in a summary assessment ⇦ ;~~.~~ ~~The~~ ⇨ the summary assessment ⇦ ~~reports~~ ⇨ shall ⇦ ~~may~~ include, where appropriate, further information and assessments on forest protection as well as information on ~~other~~ pollutants ⇨ covered by Article 10 and Annex VII. ⇦ ~~for which monitoring provisions are specified in this Directive, such as, *inter alia*, selected non-regulated ozone precursor substances as listed in Section B, of Annex X .~~

⇩ new

2. Member States shall establish an air quality index covering sulphur dioxide, nitrogen dioxide, particulate matter (PM_{10} and $PM_{2.5}$) and ozone, and make it available through a public source providing an hourly update. The air quality index shall consider the recommendations by the WHO and build on the air quality indices at European scale provided by the European Environmental Agency.

↓ 2008/50 (adapted)
⇨ new

3. Member States shall inform the public of the competent authority or body designated in relation to the tasks referred to in Article 5~~3~~.

4. The information ⇨ referred to in this Article ⇦ shall be made available ⌦ to the public ⌫ free of charge by means of ~~any~~ easily accessible media ⇨ and communication channels ⇦ ~~including the Internet or any other appropriate means of telecommunication, and shall take into account the provisions laid down~~ in ⌦ accordance with ⌫ Directive 2007/2/EC[80] ⇨ and Directive (EU)2019/1024[81] of the European Parliament and of the Council ⇦ .

↓ 2004/107

~~*Article 7*~~

~~**Public information**~~

~~1. Member States shall ensure that clear and comprehensible information is accessible and is routinely made available to the public as well as to appropriate organisations, such as environmental organisations, consumer organisations, organisations representing the interests of sensitive populations and other relevant healthcare bodies, on ambient air concentrations of arsenic, cadmium, mercury, nickel and benzo(a)pyrene and the other polycyclic aromatic hydrocarbons referred to in Article 4(8) as well as on deposition rates of arsenic, cadmium, mercury, nickel and benzo(a)pyrene and the other polycyclic aromatic hydrocarbons referred to in Article 4(8).~~

~~2. The information shall also indicate any annual exceedance of the target values for arsenic, cadmium, nickel and benzo(a)pyrene laid down in Annex I. The information shall give the reasons for the exceedance and the area to which it applies. It shall also provide a short assessment in relation to the target value and appropriate information regarding effects on health and impact on the environment.~~

~~Information on any measures taken pursuant to Article 3 shall be made available to the organisations referred to in paragraph 1 of this Article.~~

~~3. The information shall be made available by means of, for example, Internet, press and other easily accessible media.~~

~~*Article 5*~~

~~**Transmission of information and reporting**~~

~~1. With regard to the zones and agglomerations where any of the target values laid down in Annex I is exceeded, Member States shall forward the following information to the Commission:~~

~~(a) the lists of the zones and agglomerations concerned,~~

~~(b) the areas of exceedance,~~

~~(c) the concentration values assessed,~~

~~(d) the reasons for exceedance, and in particular any sources contributing to it,~~

~~(e) the population exposed to such exceedance.~~

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[80] Directive 2007/2/EC of the European Parliament and the Council of 14 March 2007 establishing an infrastructure for spatial information in the European Community (INSPIRE) (OJ L 108, 25.4.2007, p. 1).

[81] Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (OJ L 172, 26.6.2019, p. 56).

~~Member States shall also report all data assessed in accordance with Article 4, unless already reported under Council Decision 97/101/EC of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States[82].~~

~~The information shall be transmitted for each calendar year, by no later than 30 September of the following year, and for the first time for the calendar year following 15 February 2007.~~

~~2. In addition to the requirements laid down in paragraph 1, Member States shall also report any measures taken pursuant to Article 3.~~

~~3. The Commission shall ensure that all information submitted pursuant to paragraph 1 is promptly made available to the public by appropriate means, such as Internet, press and other easily accessible media.~~

↓ 219/2009 Art. 1 and Annex .3(8)

~~4. The Commission shall adopt, in accordance with the regulatory procedure referred to in Article 6(2), any detailed arrangements for forwarding the information to be provided under paragraph 1 of this Article.~~

↓ 2008/50 (adapted)
⇨ new

Article 23~~27~~

Transmission of information and reporting

1. Member States shall ensure that information on ambient air quality is made available to the Commission within the required timescale ⇨ in accordance with the implementing acts referred to in paragraph 5, and irrespective of compliance with data quality objectives laid down in Annex V ⇦ ~~as determined by the implementing measures referred to in Article 28(2)~~.

2. ~~In any event, f~~For the specific purpose of assessing compliance with the limit values, ⇨ ozone target values, average exposure reduction obligations ⇦ and critical levels ~~and the attainment of target values~~, ~~such~~ ⌦ the ⌫ information ⇨ referred to in paragraph 1 ⇦ shall be made available to the Commission no later than ⇨ 4 ⇦ ~~nine~~ months after the end of each calendar year and shall include:

(a) the changes made in that year to the list and delimitation of zones ~~and agglomerations~~ established under Article 6~~4~~ ⇨ or any NUTS 1 territorial unit ⇦ ;

(b) the list of zones ~~and agglomerations~~ ⇨ and NUTS 1 territorial units and the levels of pollutants assessed. For zones ⇦ in which the levels of one or more pollutants are higher than the limit values ~~plus the margin of tolerance where applicable or higher than target values~~ or critical levels ⇨ , as well as for NUTS 1 territorial units where the levels of one or more pollutants are higher than the target

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[82] ~~OJ L 35, 5.2.1997, p. 14. Decision as amended by Commission Decision 2001/752/EC (OJ L 282, 26.10.2001, p. 69).~~

values or average exposure reduction obligations: ⇦ ; ~~and for these zones~~ ~~and agglomerations~~:

(i) ~~levels assessed and, if relevant,~~ the dates and periods when such levels were observed;

(ii) if appropriate, an assessment on contributions from natural sources and from re-suspension of particulates following winter ~~-~~sanding or ⌦ winter ⌫ ~~-~~ salting of roads to the levels assessed, as declared to the Commission under Articles 16 and 17~~20 and 21~~.

~~3. Paragraphs 1 and 2 shall apply to information collected as from the beginning of the second calendar year after the entry into force of the implementing measures referred to in Article 28(2).~~

3. Member States shall ~~also~~ ~~forward~~ ⌦ report ⌫ to the Commission ⇨ in accordance with paragraph 1 ⇦, ~~on a provisional basis,~~ information concerning the levels recorded and the duration of the periods during which the alert threshold or information threshold was exceeded.

⇩ new

4. Member States shall provide information listed in Point D of Annex IV to the Commission within 3 months of being requested to do so.

5. The Commission shall adopt, as appropriate, by means of implementing acts, measures:

(a) determining the additional information to be made available by Member States pursuant to this Article as well as the timescales in which such information is to be communicated;

(b) identifying ways of streamlining the way data are reported and the reciprocal exchange of information and data from networks and individual sampling points measuring ambient air pollution within Member States.

Those implementing acts shall be adopted in accordance with the examination procedure referred to Article 26(2).

CHAPTER VI

DELEGATED AND IMPLEMENTING ACTS

🡻 2008/50 (adapted)

Article 24~~28~~

~~Implementing measures~~ ⌦ **Amendments to Annexes** ⌫

⇩ new

The Commission is empowered to adopt delegated acts in accordance with Article 25 amending Annexes II to IX to take account of technical and scientific developments regarding

assessment of ambient air quality, information to be included in air quality plans, and public information.

↓ 2008/50 (adapted)
⇨ new

~~Measures designed to amend the non-essential elements of this Directive, namely Annexes I to VI, Annexes VIII to X and Annex XV, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 29(3).~~

However, the amendments may not have the effect of directly or indirectly modifying either of the following:

(a) the limit values, ⇨ ozone target values ⇦ ⌦ and long-term objectives ⌫ ~~exposure reduction targets~~, critical levels, ~~target values, information or~~ alert ⌦ and information ⌫ thresholds ⇨ , average exposure reduction obligations and average exposure concentration objectives ⇦ ~~or long-term objectives~~ specified in Annex I~~VII~~ ~~and Annexes XI to XIV;~~

(b) the dates for compliance with any of the parameters referred to in point (a).

~~2. The Commission shall, in accordance with the regulatory procedure referred to in Article 29(2), determine the additional information to be made available by Member States pursuant to Article 27 as well as the timescales in which such information is to be communicated.~~

~~The Commission shall also identify ways of streamlining the way data are reported and the reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States, in accordance with the regulatory procedure referred to in Article 29(2).~~

~~3. The Commission shall draw up guidelines for the agreements on setting up common measuring stations as referred to in Article 6(5).~~

~~4. The Commission shall publish guidance on the demonstration of equivalence referred to in Section B of Annex VI.~~

⇩ new

Article 25

Exercise of delegation

1. The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.

2. The power to adopt delegated acts referred to in Article 24 shall be conferred on the Commission for an indeterminate period of time from … [date of entry into force of this Directive].

3. The delegation of power referred to in Article 24 may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the

publication of the decision in *the Official Journal of the European Union* or at a later date specified therein. It shall not affect the validity of any delegated acts already in force.

4. Before adopting a delegated act, the Commission shall consult experts designated by each Member State in accordance with the principles laid down in the Interinstitutional Agreement on Better Law-Making.

5. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.

A delegated act adopted pursuant to Article 24 shall enter into force only if no objection has been expressed either by the European Parliament or by the Council within a period of 2 months of notification of that act to the European Parliament and to the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by 2 months at the initiative of the European Parliament or of the Council.

↓ 2008/50 (adapted)
⇨ new

Article 26~~29~~

Committee ⌦ procedure ⌫

1. The Commission shall be assisted by ~~a committee,~~ 'the Ambient Air Quality Committee'. ⇨ That committee shall be a committee within the meaning of Regulation (EU) No 182/2011. ⇦

2. Where reference is made to this paragraph, ~~Articles 5 and 7 of Decision 1999/468/EC~~ ⇨ Article 5 of Regulation (EU) 182/2011 ⇦ shall apply~~, having regard to the provisions of Article 8 thereof~~.

~~The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.~~

~~3. Where reference is made to this paragraph, Article 5a(1) to (4) and Article 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.~~

↓ 2004/107

~~*Article 6*~~

~~**Committee**~~

~~1. The Commission shall be assisted by the committee established by Article 12(2) of Directive 96/62/EC.~~

~~2. Where reference is made to this Article, Articles 5 and 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.~~

~~The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.~~

↓ 219/2009 Art. 1 and Annex .3(8)

~~3. Where reference is made to this paragraph, Article 5a(1) to (4) and Article 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.~~

⇩ new

CHAPTER VII

ACCESS TO JUSTICE, COMPENSATION AND PENALTIES

Article 27

Access to justice

1. Member States shall ensure that, in accordance with their national legal system, members of the public concerned have access to a review procedure before a court of law, or another independent and impartial body established by law, to challenge the substantive or procedural legality of all decisions, acts or omissions concerning air quality plans referred to in Article 19, and short term action plans referred to in Article 20, of the Member State, provided that any of the following conditions is met:

(a) the members of the public understood as one or more natural or legal persons and, in accordance with national law or practice, their associations, organisations or groups, have a sufficient interest;

(b) where the applicable law of the Member State requires this as a precondition, the members of the public maintain the impairment of a right.

Member States shall determine what constitutes a sufficient interest and impairment of a right consistently with the objective of giving the public concerned wide access to justice.

The interest of any non-governmental organisation which is a member of the public concerned shall be deemed sufficient for the purposes of the first paragraph, point (a). Such organisations shall also be deemed to have rights capable of being impaired for the purposes of the first paragraph, point (b).

2. To have standing to participate in the review procedure shall not be conditional on the role that the member of the public concerned played during a participatory phase of the decision-making procedures related to Article 19 or 20.

3. The review procedure shall be fair, equitable, timely and not prohibitively expensive, and shall provide adequate and effective redress mechanisms, including injunctive relief as appropriate.

4. This Article does not prevent Member States from requiring a preliminary review procedure before an administrative authority and does not affect the requirement of exhaustion of administrative review procedures prior to recourse to judicial review procedures, where such a requirement exists under national law.

5. Member States shall ensure that practical information is made available to the public on access to administrative and judicial review procedures referred to in this Article.

Article 28

Compensation for damage to human health

1. Member States shall ensure that natural persons who suffer damage to human health caused by a violation of Articles 19(1) to 19(4), 20(1) and 20(2), 21(1) second sub-paragraph and 21(3) of this Directive by the competent authorities are entitled to compensation in accordance with this article.

2. Member States shall ensure that non-governmental organisations promoting the protection of human health or the environment and meeting any requirements under national law are allowed to represent natural persons referred to in paragraph 1 and bring collective actions for compensation. The requirements set out in Article 10 and Article 12(1) of Directive (EU) 2020/1828 shall mutatis mutandis apply to such collective actions.

3. Member States shall ensure that a claim for compensation for a violation can be pursued only once by a natural person referred to in paragraph 1 and by the non-governmental organisations representing the person referred to in paragraph 2. Member States shall lay down rules to ensure that the individuals affected do not receive compensation more than once for the same cause of action against the same competent authority.

4. Where a claim for compensation is supported by evidence showing that the violation referred to in paragraph 1 is the most plausible explanation for the occurrence of the damage of that person, the causal link between the violation and the occurrence of the damage shall be presumed.

The respondent public authority shall be able to rebut this presumption. In particular, the respondent shall have the right to challenge the relevance of the evidence relied on by the natural person and the plausibility of the explanation put forward.

5. Member States shall ensure that national rules and procedures relating to claims for compensation, including as concerns the burden of proof, are designed and applied in such a way that they do not render impossible or excessively difficult the exercise of the right to compensation for damage pursuant to paragraph 1.

6. Member States shall ensure that the limitation periods for bringing actions for compensation as referred to in paragraph 1 are not less than 5 years. Such periods shall not begin to run before the violation has ceased and the person claiming the compensation knows, or can reasonably be expected to know, that he or she suffered damage from a violation as referred to in paragraph 1.

↓ 2004/107 (adapted)

~~*Article 9*~~

~~**Penalties**~~

~~Member States shall determine the penalties applicable to infringements of the national provisions adopted pursuant to this Directive and shall take all the measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive.~~

↓ 2008/50 (adapted)
⇨ new

Article 29~~30~~

Penalties

⇨ 1. Without prejudice to the obligations of Member States under Directive 2008/99/EC of the European Parliament and of the Council[83], ⇦ Member States shall lay down the rules on penalties applicable to ~~infringements~~ ⌦ violations ⌫ ⇨ by natural and legal persons, ⇦ of the national provisions adopted pursuant to this Directive and shall ⌦ ensure that those rules ⌫ ~~take all measures necessary to ensure that they~~ are implemented. The penalties provided for ⌦ shall ⌫ ~~must~~ be effective, proportionate and dissuasive. ⇨ Member States shall notify the Commission without undue delay of those rules and of any amendment thereof. ⇦

⇩ new

2. The penalties referred to in paragraph 1 shall include fines proportionate to the turnover of the legal person or to the income of the natural person having committed the violation. The level of the fines shall be calculated in such a way as to make sure that they effectively deprive the person responsible for the violation of the economic benefits derived from that violation. In the case of a violation committed by a legal person, such fines shall be proportionate to the legal person's annual turnover in the Member State concerned, taking account, *inter alia*, the specificities of small and medium-sized enterprises (SMEs).

3. Member States shall ensure that the penalties referred to in paragraph 1 give due regard to the following circumstances, as applicable:

(a) the nature, gravity, extent and duration of the violation;

(b) the intentional or negligent character of the violation;

(c) the population, including sensitive population and vulnerable groups, or the environment affected by the violation, taking into account the objective of achieving a high level of protection of human health and the environment;

(d) the repetitive or singular character of the violation.

↓ 2008/50 (adapted)
⇨ new

CHAPTER VI<u>II</u>

~~COMMITTEE,~~ TRANSITIONAL AND FINAL PROVISIONS

Article 30~~31~~

Repeal and transitional provisions

[83] Directive 2008/99/EC of the European Parliament and of the Council of 19 November 2008 on the protection of the environment through criminal law (OJ L 328, 6.12.2008, p. 28).

1. Directives ~~96/62/EC, 1999/30/EC, 2000/69/EC and 2002/3/EC~~ ⌦ 2004/107/EC and 2008/50/EC, as amended by the Directives listed in Part A of Annex X, are ⌫ ~~shall be~~ repealed ~~as~~ ⌦ with effect ⌫ from ⇨ [insert date 1 day after end of transposition deadline] ⇦ ~~11 June 2010~~, without prejudice to the obligations ~~on~~ ⌦ of ⌫ Member States relating to ⌦ the ⌫ time-limits for ⌦ the ⌫ transposition ⌦ into national law ⌫ ~~or application~~ of ~~those~~ ⌦ the ⌫ Directives ⌦ set out in Part B of Annex X ⌫ .

~~However, from 11 June 2008, the following shall apply:~~

~~(a) in Directive 96/62/EC, paragraph 1 of Article 12 shall be replaced by the following:~~

~~'1. The detailed arrangements for forwarding the information to be provided under Article 11 shall be adopted in accordance with the procedure referred to in paragraph 3.';~~

~~(b) in Directive 1999/30/EC, Article 7(7), footnote 1 in point I of Annex VIII and point VI of Annex IX shall be deleted;~~

~~(c) in Directive 2000/69/EC, Article 5(7) and point III in Annex VII shall be deleted;~~

~~(d) in Directive 2002/3/EC, Article 9(5) and point II of Annex VIII shall be deleted.~~

~~2. Notwithstanding the first subparagraph of paragraph 1, the following Articles shall remain in force:~~

~~(a) Article 5 of Directive 96/62/EC until 31 December 2010;~~

~~(b) Article 11(1) of Directive 96/62/EC and Article 10(1), (2) and (3) of Directive 2002/3/EC until the end of the second calendar year following the entry into force of the implementing measures referred to in Article 28(2) of this Directive;~~

~~(c) Article 9(3) and (4) of Directive 1999/30/EC until 31 December 2009.~~

2~~3~~. References ~~made~~ to the repealed Directives shall be construed as ~~being made~~ ⌦ references ⌫ to this Directive and ~~should~~ ⌦ shall ⌫ be read in accordance with the correlation table in Annex XI~~XVII~~.

~~4. Decision 97/101/EC shall be repealed with effect from the end of the second calendar year following the entry into force of the implementing measures referred to in Article 28(2) of this Directive.~~

~~However, the third, fourth and fifth indents of Article 7 of Decision 97/101/EC shall be deleted with effect from 11 June 2008.~~

↓ 2004/107 (adapted)

~~*Article 8*~~

~~Report and review~~

~~1. The Commission shall, by 31 December 2010 at the latest, submit to the European Parliament and the Council a report based on:~~

~~(a) the experience acquired in the application of this Directive,~~

~~(b) in particular, the results of the most recent scientific research concerning the effects on human health, paying particular attention to sensitive populations, and on the~~

~~environment as a whole, of exposure to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons, and~~

~~(c) technological developments including the progress achieved in methods of measuring and otherwise assessing concentrations of these pollutants in ambient air as well as their deposition.~~

~~2. The report referred to in paragraph 1 shall take into account:~~

~~(a) current air quality, trends and projections up to and beyond 2015;~~

~~(b) the scope for making further reductions in polluting emissions from all relevant sources, and the possible merit in introducing limit values aimed at reducing the risk to human health, for the pollutants listed in Annex I, taking account of technical feasibility and cost-effectiveness and any significant additional health and environmental protection that this would provide;~~

~~(c) the relationships between pollutants and opportunities for combined strategies for improving Community air quality and related objectives;~~

~~(d) current and future requirements for informing the public and for the exchange of information between Member States and Commission;~~

~~(e) the experience acquired in the application of this Directive in Member States, and in particular the conditions under which measurement has been carried out as laid down in Annex III;~~

~~(f) secondary economic benefits for the environment and health in reducing the emissions of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons to the extent that these can be assessed;~~

~~(g) the adequacy of the particle size fraction used for sampling in view of general particulate matter measurement requirements;~~

~~(h) the suitability of benzo(a)pyrene as a marker for the total carcinogenic activity of polycyclic aromatic hydrocarbons, having regard to predominantly gaseous forms of polycyclic aromatic hydrocarbons such as fluoranthene.~~

~~In the light of the latest scientific and technological developments the Commission shall also examine the effect of arsenic, cadmium and nickel on human health with a view to quantifying their genotoxic carcinogenicity. Taking account of measures adopted pursuant to the mercury strategy the Commission shall also consider whether there would be merit in taking further action in relation to mercury, taking account of technical feasibility and cost-effectiveness and any significant additional health and environmental protection that this would provide.~~

~~3. With a view to achieving levels of ambient air concentrations that would further reduce harmful effects on human health and would lead to a high level of protection of the environment as a whole, taking into account the technical feasibility and cost-effectiveness of further action, the report referred to in paragraph 1 may be accompanied, if appropriate, by proposals for amendments to this Directive, particularly taking into account the results obtained in accordance with paragraph 2. In addition the Commission shall consider regulating the deposition of arsenic, cadmium, mercury, nickel and specific polycyclic aromatic hydrocarbons.~~

↓ 2008/50 (adapted)

~~*Article 32*~~

~~**Review**~~

~~1. In 2013 the Commission shall review the provisions related to $PM_{2,5}$ and, as appropriate, other pollutants, and shall present a proposal to the European Parliament and the Council.~~

~~As regards $PM_{2,5}$, the review shall be undertaken with a view to establishing a legally binding national exposure reduction obligation in order to replace the national exposure reduction target and to review the exposure concentration obligation laid down in Article 15, taking into account, *inter alia*, the following elements:~~

- ~~latest scientific information from WHO and other relevant organisations,~~
- ~~air quality situations and reduction potentials in the Member States,~~
- ~~the revision of Directive 2001/81/EC,~~
- ~~progress made in implementing Community reduction measures for air pollutants,~~

~~2. The Commission shall take into account the feasibility of adopting a more ambitious limit value for $PM_{2,5}$, shall review the indicative limit value of the second stage for $PM_{2,5}$ and consider confirming or altering that value.~~

~~3. As part of the review, the Commission shall also prepare a report on the experience and on the necessity of monitoring of PM_{10} and $PM_{2,5}$, taking into account technical progress in automatic measuring techniques. If appropriate, new reference methods for the measurement of PM_{10} and $PM_{2,5}$ shall be proposed.~~

↓ 2004/107

~~*Article 10*~~

~~**Implementation**~~

~~1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 15 February 2007 at the latest. They shall forthwith inform the Commission thereof.~~

~~When Member States adopt these measures, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. Member States shall determine how such reference is to be made.~~

~~2. Member States shall communicate to the Commission the texts of the main provisions of national law, which they adopt in the field covered by this Directive.~~

↓ 2008/50 (adapted)
⇨ new

Article 31 ~~*33*~~

Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with ~~this Directive~~ ⌦ Articles 1, 2 and 3, Article 4, points (2), (13), (14), (16), (18), (19), (21), (22), points (24) to (30), points (36), (37), (38) and (39), Articles 5 to 12, Article 13(1), (2), (3), (6) and (7), Article 15, Article 16(1) and (2), Articles 17 to 21, Article 22(1), (2) and (4), Articles 23 to 29 and Annexes I to IX ⌫ ⇨ by [insert date : two years after entry into force] at the latest ⇦~~before 11 June 2010~~.

When Member States adopt ~~these~~ ⌦ the ⌫ measures ⌦ referred to in this paragraph ⌫ , they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. ⌦ They shall also include a statement that references in existing laws, regulations and administrative provisions to the Directives repealed by this Directive shall be construed as references to this Directive. Member States shall determine how such reference is to be made and how that statement is to be formulated. ⌫ ~~The methods of making such reference shall be laid down by Member States.~~

2. Member States shall communicate to the Commission the text of the main ⌦ measures ⌫ ~~provisions~~ of national law which they adopt in the field covered by this Directive.

Article 32~~34~~

Entry into force

This Directive shall enter into force on the ⌦ twentieth ⌫ day ⌦ following that ⌫ of its publication in the *Official Journal of the European Union*.

⇩ new

Article 4(1), (3) to (12), Article 4(15), (17), (20), (23) and (31) to (35), Article 13(4) and (5), Article 14, Article 16(3) and Article 22(3) shall apply from [the day after the date in the first subparagraph of Article 31(1)].

🡻 2008/50

Article 33~~35~~

Addressees

This Directive is addressed to the Member States.

Done at Brussels,

For the European Parliament	*For the Council*
The President	*The President*

EUROPEAN
COMMISSION

Brussels, 26.10.2022
COM(2022) 542 final

ANNEXES 1 to 11

ANNEXES

to the

Proposal for a Directive of the European Parliament and of the Council

on ambient air quality and cleaner air for Europe (recast)

{SEC(2022) 542 final} - {SWD(2022) 345 final} - {SWD(2022) 542 final} -
{SWD(2022) 545 final}

⇩ new

ANNEX I

AIR QUALITY STANDARDS

SECTION 1 - LIMIT VALUES FOR THE PROTECTION OF HUMAN HEALTH

Table 1 – Limit values for the protection of human health to be attained by 1 January 2030

Averaging period	**Limit value**	
$PM_{2.5}$		
1 day	25 µg/m^3	not to be exceeded more than 18 times per calendar year
Calendar year	10 µg/m^3	
PM_{10}		
1 day	45 µg/m^3	not to be exceeded more than 18 times per calendar year
Calendar year	20 µg/m^3	
Nitrogen dioxide (NO_2)		
1 hour	200 µg/m^3	not to be exceeded more than once per calendar year
1 day	50 µg/m^3	not to be exceeded more than 18 times per calendar year
Calendar year	20 µg/m^3	
Sulphur dioxide (SO_2)		
1 hour	350 µg/m^3	not to be exceeded more than once per calendar year
1 day	50 µg/m^3	not to be exceeded more than 18 times per calendar year
Calendar year	20 µg/m^3	
Benzene		
Calendar year	3,4 µg/m^3	
Carbon monoxide (CO)		
maximum daily 8-hour mean (1)	10 mg/m^3	
1 day	4 mg/m^3	not to be exceeded more than 18 times per calendar year

Lead (Pb)	
Calendar year	0,5 µg/m^3
Arsenic (As)	
Calendar year	6,0 ng/m^3
Cadmium (Cd)	
Calendar year	5,0 ng/m^3
Nickel (Ni)	
Calendar year	20 ng/m^3
Benzo(a)pyrene	
Calendar year	1,0 ng/m^3

(1) The maximum daily 8-hour mean concentration will be selected by examining 8-hour running averages, calculated from hourly data and updated each hour. Each 8-hour average so calculated will be assigned to the day on which it ends i.e. the first calculation period for any 1 day will be the period from 17.00 on the previous day to 1.00 on that day; the last calculation period for any 1 day will be the period from 16.00 to 24.00 on that day.

Table 2 – Limit values for the protection of human health to be attained by [INSERT TRANSPOSITION DEADLINE]

Averaging period	**Limit value**	
$PM_{2.5}$		
Calendar year	25 µg/m^3	
PM_{10}		
1 day	50 µg/m^3	not to be exceeded more than 35 times per calendar year
Calendar year	40 µg/m^3	
Nitrogen dioxide (NO_2)		
1 hour	200 µg/m^3	not to be exceeded more than 18 times per calendar year
Calendar year	40 µg/m^3	
Sulphur dioxide (SO_2)		
1 hour	350 µg/m^3	not to be exceeded more than 24 times per calendar year
1 day	125 µg/m^3	not to be exceeded more than 3 times per calendar year

Benzene	
Calendar year	5 μg/m^3
Carbon monoxide (CO)	
maximum daily 8-hour mean (1)	10 mg/m^3
Lead (Pb)	
Calendar year	0,5 μg/m^3
Arsenic (As)	
Calendar year	6,0 ng/m³
Cadmium (Cd)	
Calendar year	5,0 ng/m³
Nickel (Ni)	
Calendar year	20 ng/m³
Benzo(a)pyrene	
Calendar year	1,0 ng/m³

(1) The maximum daily 8-hour mean concentration will be selected by examining 8-hour running averages, calculated from hourly data and updated each hour. Each 8-hour average so calculated will be assigned to the day on which it ends i.e. the first calculation period for any 1 day will be the period from 17.00 on the previous day to 1.00 on that day; the last calculation period for any 1 day will be the period from 16.00 to 24.00 on that day.

SECTION 2 - OZONE TARGET VALUES AND ZONE LONG-TERM OBJECTIVES

A. Definitions and criteria

The 'Accumulated Ozone exposure over a Threshold of 40 parts per billion' (AOT40), expressed in '($\mu g/m^3$) × hours', means the sum of the difference between hourly concentrations greater than 80 $\mu g/m^3$ (= 40 parts per billion) and 80 $\mu g/m^3$ over a given period using only the 1-hour values measured between 8.00 and 20.00 Central European Time (CET) each day.

B. Ozone target values

Objective	**Averaging period**	**Target value**	
Protection of human health	Maximum daily 8-hour mean (1)	120 $\mu g/m^3$	not to be exceeded on more than 18 days per calendar year averaged over 3 years (2)
Protection of the environment	May to July	AOT40 (calculated from 1-hour values)	18 000 $\mu g/m^3$ × h averaged over 5 years (2)

(1) The maximum daily 8-hour mean concentration shall be selected by examining 8-hour running averages, calculated from hourly data and updated each hour. Each 8-hour average so calculated shall be assigned to the day on which it ends. i.e. the first calculation period for any 1 day will be the period from 17.00 on the previous day to 1.00 on that day; the last calculation period for any 1 day will be the period from 16.00 to 24.00 on the day.

(2) If the 3- or 5-year averages cannot be determined on the basis of a full and consecutive set of annual data, the minimum annual data required for checking compliance with the target values will be as follows:
- for the target value for the protection of human health: valid data for 1 year,
- for the target value for the protection of vegetation: valid data for 3 years.

C. **Long-term objectives for ozone (O_3)**

Objective	**Averaging period**	**Long-term objective**	
Protection of human health	Maximum daily 8-hour mean within a calendar year	100 $\mu g/m^3$ (1)	
Protection of vegetation	May to July	AOT40 (calculated from 1 h values)	6 000 $\mu g/m^3$ × h

(1) 99th percentile (i.e. 3 exceedance days per year).

SECTION 3 - CRITICAL LEVELS FOR THE PROTECTION OF VEGETATION AND NATURAL ECOSYSTEMS

Averaging period	**Critical level**
Sulphur dioxide (SO_2)	
Calendar year and winter (1 October to 31 March)	20 $\mu g/m^3$
Oxides of nitrogen (NO_x)	
Calendar year	30 $\mu g/m^3$ NO_x

SECTION 4 - ALERT AND INFORMATION THRESHOLDS

A. Alert thresholds for pollutants other than ozone

To be measured over 3 consecutive hours in the case of sulphur dioxide and nitrogen dioxide, and over three consecutive days for PM_{10} and $PM_{2.5}$, at locations representative of air quality over at least 100 km^2 or an entire zone, whichever is the smaller.

Pollutant	**Alert threshold**
Sulphur dioxide (SO_2)	500 $\mu g/m^3$
Nitrogen dioxide (NO_2)	400 $\mu g/m^3$
$PM_{2.5}$	50 $\mu g/m^3$
PM_{10}	90 $\mu g/m^3$

B. Information and alert thresholds for ozone

Purpose	**Averaging period**	**Threshold**
Information	1 hour	180 $\mu g/m^3$
Alert	1 hour (1)	240 $\mu g/m^3$

(1) For the implementation of Article 20, the exceedance of the threshold is to be measured or predicted for 3 consecutive hours.

SECTION 5 - AVERAGE EXPOSURE REDUCTION OBLIGATION FOR $PM_{2.5}$ AND NO_2

A. Average exposure indicator

The Average Exposure Indicator expressed in µg/m^3 (AEI) shall be based upon measurements in urban background locations in territorial units at NUTS 1 level throughout the territory of a Member State. It shall be assessed as a 3-calendar-year running annual mean concentration averaged over all sampling points of the relevant pollutant established pursuant to Point B of Annex III in each NUTS 1 territorial unit. The AEI for a particular year shall be the mean concentration of that same year and the preceding 2 years.

Where Member States identify exceedances attributable to natural sources, contributions from natural sources shall be deducted before calculating the AEI.

The AEI is used for the examination of whether the average exposure reduction obligation is met.

B. Average exposure reduction obligations

As from 2030, the AEI shall not exceed a level that is:

– for $PM_{2.5}$, 25% lower than the AEI was 10 years before, unless it is already no higher than the average exposure concentration objective for $PM_{2.5}$ defined in Section C.

– for NO_2, 25% lower than the AEI was 10 years before, unless it is already no higher than the average exposure concentration objective for NO_2 defined in Section C.

C. Average exposure concentration objectives

The average exposure concentration objective shall be the following level of the AEI.

Pollutant	**Average exposure concentration objective**
$PM_{2.5}$	AEI = 5 µg/m^3
NO_2	AEI = 10 µg/m^3

ANNEX II

ASSESSMENT THRESHOLDS

SECTION 1 - ASSESSMENT THRESHOLDS FOR HEALTH PROTECTION

Pollutant	**Assessment threshold (annual mean, unless specified)**
$PM_{2.5}$	5 µg/m^3
PM_{10}	15 µg/m^3
Nitrogen dioxide (NO_2)	10 µg/m^3
Sulphur dioxide (SO_2)	40 µg/m^3 (24-hour mean)(1)
Benzene	1,7 µg/m^3
Carbon monoxide (CO)	4 mg/m^3 (24-hour mean)(1)
Lead (Pb)	0,25 µg/m^3
Arsenic (As)	3,0 ng/m^3
Cadmium (Cd)	2,5 ng/m^3
Nickel (Ni)	10 ng/m^3
Benzo(a)pyrene	0,12 ng/m^3
Ozone (O_3)	100 µg/m^3 (maximum 8-hour mean)(1)
(1) 99th percentile (i.e. 3 exceedance days per year).	

SECTION 2 - ASSESSMENT THRESHOLDS FOR THE PROTECTION OF VEGETATION AND NATURAL ECOSYSTEMS

Pollutant	**Assessment threshold (annual mean, unless specified)**
Sulphur dioxide (SO_2)	8 µg/m^3 (average between 1 October and 31 March)
Oxides of nitrogen (NOx)	19,5 µg/m^3

ANNEX III

MINIMUM NUMBERS OF SAMPLING POINTS FOR FIXED MEASUREMENT

A. Minimum number of sampling points for fixed measurement to assess compliance with limit values for the protection of human health, ozone target values, long-term objectives, information thresholds and alert thresholds

1. Diffuse sources

Table 1 - Minimum number of sampling points for fixed measurement to assess compliance with limit values for the protection of human health and alert thresholds in zones where fixed measurement is the sole source of information (for all pollutants except ozone)

Population of zone (thousands)	**Minimum number of sampling points if concentrations exceed the assessment threshold**					
	NO_2, SO_2, CO, benzene	**Sum PM (1)**	**Minimum PM_{10}**	**Minimum $PM_{2.5}$**	**Pb, Cd, As, Ni in PM_{10}**	**Benzo(a) pyrene in PM_{10}**
0 - 249	2	4	2	2	1	1
250 - 499	2	4	2	2	1	1
500 - 749	2	4	2	2	1	1
750 - 999	3	4	2	2	2	2
1 000 - 1 499	4	6	2	2	2	2
1 500 - 1 999	5	7	3	3	2	2
2 000 - 2 749	6	8	3	3	2	3
2 750 - 3 749	7	10	4	4	2	3
3 750 - 4 749	8	11	4	4	3	4
4 750 - 5 999	9	13	5	5	4	5
6 000+	10	15	5	5	5	5

(1) The number of $PM_{2.5}$ and NO_2 sampling points in the urban background locations of urban areas shall meet the requirements set out in Point B.

Table 2 - Minimum number of sampling points for fixed measurement to assess compliance with ozone target values, long-term objectives and information and alert thresholds where such measurements are the sole source of information (for ozone only)

Population (thousands)	**Minimum number of sampling points if the number of sampling points is reduced by up to 50% (1)**
< 250	1
< 500	2
< 1 000	2
< 1 500	3
< 2 000	4
< 2 750	5
< 3 750	6
≥ 3 750	1 additional sampling point per 2 million inhabitants

(1) At least 1 sampling point in areas where exposure of the population to the highest concentrations of ozone is likely to occur. In agglomerations, at least 50 % of the sampling points shall be located in suburban areas.

Table 3 - Minimum number of sampling points for fixed measurement to assess compliance with limit values for the protection of human health and alert thresholds in zones where a 50% reduction of such measurements applies (for all pollutants except ozone)

Population of zone (thousands)	**Minimum number of sampling points if the number of sampling points is reduced by up to 50%**					
	NO_2, SO_2, CO, benzene	**Sum PM (1)**	**Minimum PM_{10}**	**Minimum $PM_{2.5}$**	**Pb, Cd, As, Ni in PM_{10}**	**Benzo(a) pyrene in PM_{10}**
0 - 249	1	2	1	1	1	1
250 - 499	1	2	1	1	1	1
500 - 749	1	2	1	1	1	1
750 - 999	2	2	1	1	1	1
1 000 - 1 499	2	3	1	1	1	1
1 500 - 1 999	3	4	2	2	1	1
2 000 - 2 749	3	4	2	2	1	2
2 750 - 3 749	4	5	2	2	1	2
3 750 - 4 749	4	6	2	2	2	2
4 750 - 5 999	5	7	3	3	2	3
6 000+	5	8	3	3	3	3

(1) The number of $PM_{2.5}$ and NO_2 sampling points in the urban background locations of urban areas shall meet the requirements set out in Point B.

Table 4 - Minimum number of sampling points for fixed measurements to assess compliance with ozone target values, long-term objectives and information and alert thresholds in zones where a 50% reduction of such measurements applies (for ozone only)

Population of zone (thousands)	**Minimum number of sampling points if the number of sampling points is reduced by up to 50% (1)**
< 250	1
< 500	1
< 1 000	1
< 1 500	2
< 2 000	2
< 2 750	3
< 3 750	3
≥ 3 750	1 additional sampling point per 4 million inhabitants

(1) At least 1 sampling point in areas where exposure of the population to the highest concentrations of ozone is likely to occur. In agglomerations, at least 50 % of the sampling points shall be located in suburban areas.

For each zone, the minimum number of sampling points for fixed measurements set out in the tables in this point shall include at least 1 background location sampling point and 1 sampling point in the area with the highest concentrations according to Point B, of Annex IV provided this does not increase the number of sampling points. For nitrogen dioxide, particulate matter, benzene and carbon monoxide, this shall include at least 1 sampling point focused on measuring contribution from transport emissions. However, in the cases where there is only 1 sampling point required, this shall be in the area with the highest concentrations to which the population is likely to be directly or indirectly exposed.

For each zone, for nitrogen dioxide, particulate matter, benzene and carbon monoxide, the total number of urban background location sampling points and the total number of sampling points where the highest concentrations occur required shall not differ by more than a factor of 2. The number of $PM_{2.5}$ and nitrogen dioxide sampling points at urban background locations shall meet the requirements set out in Point B.

2. Point sources

For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurement shall be calculated taking into account emission densities, the likely distribution patterns of ambient-air pollution and the potential exposure of the population. Such sampling points shall be sited such that the application of BAT (Best Available Techniques) as defined by Directive 2010/75/EU can be monitored.

B. Minimum number of sampling points for fixed measurement to assess compliance with the PM_{25} and NO_2 average exposure reduction obligations for the protection of human health

For $PM_{2.5}$ and NO_2 each, one sampling point per NUTS 1 region as described in Regulation (EC) No 1059/2003, and at least 1 sampling point per million inhabitants calculated over urban areas in excess of 100 000 inhabitants shall be operated for this purpose. Those sampling points may coincide with sampling points under Point A.

C. Minimum number of sampling points for fixed measurements to assess compliance with critical levels, and with long-term objectives for ozone

1. Critical levels for the protection of vegetation and natural ecosystems

If maximum concentrations exceed the critical levels	1 sampling point every 20 000 km^2
If maximum concentrations exceed the assessment threshold	1 sampling point every 40 000 km^2

In island zones the number of sampling points for fixed measurement shall be calculated taking into account the likely distribution patterns of ambient air pollution and the potential exposure of vegetation.

2. Long–term objective for the protection of human health and the environment for ozone

For rural background measurement Member States shall ensure at least 1 sampling point per 50 000 km^2 as an average density over all zones per country. For complex terrain 1 sampling point per 25 000 km^2 is recommended.

D. Minimum number of sampling points for fixed measurements of ultrafine particles where high concentrations

Ultrafine particles shall be monitored at selected locations in addition to other air pollutants. Sampling points to monitor ultrafine particles shall coincide, where appropriate, with sampling points for particulate matter or nitrogen dioxide referred to in Point A, and be sited in accordance with Section 3 of Annex VII. For this purpose, at least 1 sampling point per 5 million inhabitants shall be established at a location where high UFP concentrations are likely to occur. Member States that have fewer than 5 million inhabitants shall establish at least 1 fixed sampling point at a location where high UFP concentrations are likely to occur.

Monitoring supersites at urban background or rural background locations established in accordance with Article 10 shall not be included for the purpose of meeting the requirements on the minimum number of sampling points for UFP set here.

ANNEX IV

ASSESSMENT OF AMBIENT AIR QUALITY AND LOCATION OF SAMPLING POINTS

A. General

Ambient air quality shall be assessed in all zones as follows:

7. Ambient air quality shall be assessed at all locations except those listed in paragraph 2.

Points B and C shall apply to the location of sampling points. The principles established by Points B and C shall also apply in so far as they are relevant in identifying the specific locations in which concentration of the relevant pollutants are established where ambient air quality is assessed through indicative measurements or modelling.

8. Compliance with the limit values directed at the protection of human health shall not be assessed at the following locations:

(a) any locations situated within areas where members of the public do not have access and there is no fixed habitation;

(b) in accordance with Article 4(1), on factory premises or at industrial sites to which all relevant provisions concerning health and safety at work apply;

(c) on the carriageway of roads; and on the central reservations of roads except where there is normally pedestrian access to the central reservation.

B. Macroscale siting of sampling points

1. Information

The siting of sampling points shall take into account national gridded data of emissions reported under Directive (EU) 2016/2284 of the European Parliament and of the Council[84] and emission data reported under the European Pollutant Release and Transfer Register.

2. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on all of the following:

(i) concentration levels in the areas within zones with the highest concentrations to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),

(ii) concentration levels in other areas within the zones which are representative of the exposure of the general population, and

(iii) for arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons, the deposition rates representing the indirect exposure of the population through the food chain;

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84 Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (OJ L 344, 17.12.2016, p. 1).

(b) sampling points shall in general be sited in such a way as to avoid measuring micro-environments in the immediate vicinity of the sampling point, which means that a sampling point must be sited in such a way that the air sampled is representative of air quality for a street segment no less than 100 m in length at locations measuring the contribution of road traffic and at least 250 m × 250 m at locations measuring the contribution from industrial sites or other sources such as ports or airports, where feasible;

(c) urban background locations shall be located so that their pollution level is influenced by the integrated contribution from all sources upwind of the sampling point. The pollution level shall not be dominated by a single source unless such a situation is typical for a larger urban area. Those sampling points shall, as a general rule, be representative for several square kilometres;

(d) where the objective is to measure the contribution of domestic heating, at least one sampling point shall be installed within the main wind direction of these sources;

(e) where the objective is to assess rural background levels, the sampling point shall not be influenced by urban areas or industrial sites in its vicinity, i.e. sites closer than 5 km;

(f) where contributions from industrial sources, ports or airports are to be assessed, at least 1 sampling point shall be installed downwind of the source in the nearest residential area. Where the background concentration is not known, an additional sampling point shall be situated within the main wind direction. The sampling points shall be sited such that the application of BAT can be monitored;

(g) sampling points shall, where possible, also be representative of similar locations not in the immediate vicinity of the sampling points. In the zones where the level of air pollutants is above the assessment threshold, the area which each sampling point is representative of shall be clearly defined. The whole zone shall be covered by the different areas of representativeness defined for each sampling points;

(h) account shall be taken of the need to locate sampling points on islands where that is necessary for the protection of human health;

(i) sampling points measuring arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons shall, where possible, be co-located with sampling points for PM_{10}.

When defining the spatial representativeness area the following associated characteristics shall be considered:

(a) the geographical area may include non-contiguous domains but shall be limited in its extension by the borders of the air quality zone under consideration;

(b) if assessed via modelling, a fit-for-purpose modelling system shall be used and modelled concentrations shall be used at station location to prevent systematic model-measurement biases from distorting the assessment;

(c) other metrics than absolute concentrations can be considered (e.g. percentiles);

(d) the tolerance levels and possible cut-offs for the different pollutants may change depending on the station characteristics;

(e) the annual average of the observed pollutant concentration shall be used as the air quality metric for a specific year.

3. Protection of vegetation and natural ecosystems

Sampling points targeted at the protection of vegetation and natural ecosystems shall be sited more than 20 km away from urban areas or more than 5 km away from other built-up areas, industrial sites or motorways or major roads with traffic counts of more than 50 000 vehicles per day, which means that a sampling point must be sited in such a way that the air sampled is representative of air quality in a surrounding area of at least 1 000 km^2. A Member State may provide for a sampling point to be sited at a lesser distance or to be representative of air quality in a less extended area, taking account of geographical conditions or of the opportunities to protect particularly vulnerable areas.

Account shall be taken of the need to assess air quality on islands.

4. Additional criteria for ozone sampling points

The following apply to fixed and indicative measurements:

Type of sampling point	**Objectives of measurement**	**Representativeness (1)**	**Macro-scale siting criteria**
Urban background locations for ozone assessments	Protection of human health: to assess the exposure of the urban population to ozone, i.e. where population density and ozone concentration are relatively high and representative of the exposure of the general population	1 to 10 km^2	Away from the influence of local emissions such as traffic, petrol stations, etc.; vented locations where well mixed levels can be measured; locations such as residential and commercial areas of cities, parks (away from trees), wide streets or squares with very little or no traffic, open areas characteristic of educational, sports or recreation facilities.
Suburban locations for ozone assessments	Protection of human health and vegetation: to assess the exposure of the population and vegetation located in the outskirts of the urban area, with the highest ozone levels to which the population and vegetation are likely to be directly or indirectly exposed.	10 to 100 km^2	At a certain distance from the area of maximum emissions, downwind following the main wind direction/directions during conditions favourable to ozone formation; where population, sensitive crops or natural ecosystems located in the outer fringe of an urban area are exposed to high ozone levels; where appropriate, some suburban sampling points also upwind of the area of maximum emissions, in order to determine

			the regional background levels of ozone.
Rural locations for ozone assessments	Protection of human health and vegetation: to assess the exposure of population, crops and natural ecosystems to sub-regional scale ozone concentrations.	Sub-regional levels (100 to 1 000 km^2)	Sampling points may be located in small settlements and/or areas with natural ecosystems, forests or crops; representative for ozone away from the influence of immediate local emissions such as industrial sites and roads; at open area sites, but not on summits of higher mountains.
Rural background locations for ozone assessments	Protection of human health and vegetation: to assess the exposure of crops and natural ecosystems to regional-scale ozone concentrations as well as exposure of the population.	Regional/national/continental levels (1 000 to 10 000 km^2)	Sampling points located in areas with lower population density, e.g. with natural ecosystems, forests, at a distance of at least 20 km from urban and industrial areas and away from local emissions; avoid locations which are subject to locally enhanced formation of ground-near inversion conditions, also summits of higher mountains; coastal sites with pronounced diurnal wind cycles of local character are not recommended.

(1) Sampling points shall, where possible, be representative of similar locations not in the immediate vicinity of the sampling points.

The locations of sampling points for rural locations and rural background locations for ozone assessment shall, where appropriate, be coordinated with the monitoring requirements of Commission Regulation (EC) No 1737/2006[85].

C. Micro-scale siting of sampling points

In so far as is practicable, the following shall apply:

(a) the flow around the sampling point inlet shall be unrestricted (in general free in an arc of at least 270°, or, for sampling points at the building line, of at least 180°) without any obstructions affecting the airflow in the vicinity of the inlet (at least 1,5 m away from buildings, balconies, trees and other obstacles, and at least 0,5 m from the

[85] Commission Regulation (EC) No 1737/2006 of 7 November 2006 laying down detailed rules for the implementation of Regulation (EC) No 2152/2003 of the European Parliament and of the Council concerning monitoring of forests and environmental interactions in the Community (OJ L 334, 30.11.2006, p. 1).

nearest building in the case of sampling points representing air quality at the building line);

(b) in general, the sampling point inlet shall be between 0,5 m (the breathing zone) and 4 m above the ground. Higher siting (up to 8m) may be appropriate if the sampling point is representative of a large area (a background location) or in other specific circumstances and any derogations shall be fully documented;

(c) the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air to which members of the public are unlikely to be exposed;

(d) the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided;

(e) for all pollutants, sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside; for the purposes of this point, a 'kerbside' means the line that separates motorised traffic from other areas; a 'major junction' means a junction which interrupts the traffic flow and causes different emissions (stop&go) from the rest of the road;

(f) for the deposition measurements in rural background locations, the guidelines and criteria of EMEP shall apply as far as practicable;

(g) for ozone measurement, Member States shall ensure that the sampling point is positioned well away from sources such as furnaces and incineration flues, and more than 10 m from the nearest road, with distance increasing as a function of traffic intensity.

The following factors may also be taken into account:

(a) interfering sources;

(b) security;

(c) access;

(d) availability of electrical power and telephone communications;

(e) visibility of the site in relation to its surroundings;

(f) safety of the public and operators;

(g) the desirability of co-locating sampling points for different pollutants;

(h) planning requirements.

D. Site selection, its review and documentation

1. The competent authorities responsible for air quality assessment shall for all zones fully document the site-selection procedures and record information to support the network design and choice of location for all monitoring sites. The design of the monitoring network shall be supported at least by either modelling or indicative measurements.

2. The documentation shall include the location of the sampling points through spatial coordinates, detailed maps and shall include information on the spatial representativeness of all sampling points.

3. The documentations shall include any deviation from the micro-scale siting criteria, their underlying reasons and the likely impact on measured levels.

4. Where indicative measurements, modelling or objective estimation, or a combination thereof are used within a zone, the documentation shall include details of these methods and information on how the criteria listed in Article 9(3) are met.

5. Where indicative measurements, modelling or objective estimation are used, competent authorities shall use gridded data reported under Directive (EU) 2016/2284 and emission information reported under Directive 2010/75/EU.

6. For ozone measurements, Member States shall apply proper screening and interpretation of the monitoring data in the context of the meteorological and photochemical processes affecting the ozone concentrations measured at the respective sites.

7. When applicable, the list of ozone precursors substances, the objective sought for measuring them and the methods used to sample and measure them shall be part of the documentation.

8. When applicable, information of the measurement methods used for the measurement of the chemical composition of $PM_{2.5}$ shall also be part of the documentation.

9. At least every 5 years the selection criteria, network design and monitoring site locations, defined by the competent authorities in view of the requirements of this Annex, shall be reviewed to ensure they remain valid and optimal overtime. The review shall be supported at least by either modelling or indicative measurements.

10. The documentation shall be updated following every review and other relevant changes to the monitoring network, and shall be made public through appropriate communication channels

ANNEX V

DATA QUALITY OBJECTIVES

A. Uncertainty of measurements and modelling for ambient air quality assessment

1. Uncertainty for measurement and modelling of long-term mean concentrations (annual mean)

Air pollutant	Maximum uncertainty of fixed measurements		Maximum uncertainty of indicative measurements (1)		Maximum ratio of uncertainty of modelling and objective estimation over uncertainty of fixed measurements
	Absolute value	Relative value	Absolute value	Relative value	Maximum ratio
$PM_{2.5}$	3,0 µg/m^3	30 %	4,0 µg/m^3	40 %	1,7
PM_{10}	4,0 µg/m^3	20 %	6,0 µg/m^3	30 %	1,3
NO_2 / NO_x	6,0 µg/m^3	30 %	8,0 µg/m^3	40 %	1,4
Benzene	0,75 µg/m^3	25 %	1,2 µg/m^3	35 %	1,7
Lead	0,125 µg/m^3	25 %	0,175 µg/m^3	35 %	1,7
Arsenic	2,4 ng/m^3	40 %	3,0 ng/m^3	50 %	1,1
Cadmium	2,0 ng/m^3	40 %	2,5 ng/m^3	50 %	1,1
Nickel	8,0 ng/m^3	40 %	10,0 ng/m^3	50 %	1,1
Benzo(a)pyrene	0,5 ng/m^3	50 %	0,6 ng/m^3	60 %	1,1

(1) When using indicative measurements for other purposes other than compliance assessment, such as, but not only: design or review of the monitoring network, model calibration and validation, the uncertainty may be that established for modelling applications.

2. Uncertainty for measurement and modelling of short-term mean concentrations

Air pollutant	Maximum uncertainty of fixed measurements		Maximum uncertainty of indicative measurements (1)		Maximum ratio of uncertainty of modelling and objective estimation over uncertainty of fixed measurements
	Absolute value	Relative value	Absolute value	Relative value	Maximum ratio
$PM_{2.5}$ (24-hour)	6,3 µg/m^3	25 %	8,8 µg/m^3	35 %	2,5
PM_{10} (24-hour)	11,3 µg/m^3	25 %	22,5 µg/m^3	50 %	2,2
NO_2 (daily)	7,5 µg/m^3	15 %	12,5 µg/m^3	25 %	3,2
NO_2 (hourly)	30 µg/m^3	15 %	50 µg/m^3	25 %	3,2
SO_2 (daily)	7,5 µg/m^3	15 %	12,5 µg/m^3	25 %	3,2
SO_2 (hourly)	52,5 µg/m^3	15 %	87,5 µg/m^3	25 %	3,2
CO (24-hour)	0,6 mg/m^3	15 %	1,0 mg/m^3	25 %	3,2
CO (8-hour)	1,0 mg/m^3	10 %	2,0 mg/m^3	20 %	4,9
Ozone (peak season): uncertainty of the 8h values	10,5 µg/m^3	15 %	17,5 µg/m^3	25 %	1,7
Ozone (8h mean)	18 µg/m^3	15 %	30 µg/m^3	25 %	2,2

(1) When using indicative measurements for other purposes other than compliance assessment, such as, but not only: design or review of the monitoring network, model calibration and validation, the uncertainty may be that established for modelling applications.

The uncertainty for measurements (expressed at a 95 % confidence level) of the assessment methods shall be calculated in line with the respective EN standard of each pollutant. For methods where no standard is available, the uncertainty of the assessment method shall be evaluated in accordance with the principles of the Joint Committee for Guidance in Metrology (JCGM) 100:2008 'Evaluation of measurement data - Guide to the Expression of Uncertainty in Measurement' and the methodology in Part 5 of ISO 5725:1998. For indicative measurements, uncertainty shall be calculated according to the guidance on the demonstration of equivalence referred to in Point B of Annex VI.

The percentages for uncertainty in the tables in this Section apply for all limit values (and the ozone target value) that are calculated by simple averaging of individual measurements such as hourly mean, daily mean or yearly mean values without considering the additional uncertainty for the calculation of the number of exceedances. The uncertainty shall be interpreted as being applicable in the region of the appropriate

limit values (or ozone target value). The uncertainty calculation does not apply to AOT40 and values that include more than 1 year, more than 1 station (e.g. AEI) or more than 1 component. They are also not applicable for information thresholds, alert thresholds and critical levels for the protection of vegetation and natural ecosystems.

The uncertainty of measurement data used for ambient air quality assessment shall not exceed either the absolute value or the relative value expressed in this Section.

The maximum uncertainty of modelling is set to the uncertainty for fixed measurements multiplied by the applicable maximum ratio. The modelling quality objective (i.e. a modelling quality indicator less or equal to 1) shall be verified at least at 90% of the available monitoring points, over the assessment area and period considered. At a given monitoring point, the modelling quality indicator shall be calculated as the ratio of the root mean square error(s) between modelling results and measurements over the square root of the quadratic sum(s) of the modelling and measurement uncertainties, over an entire assessment period. Note that the sum will reduce to a single value when annual means are considered. All fixed measurements meeting the data quality objectives (i.e. uncertainty of measurement and data coverage of measurement as specified in Sections A and B of this Annex, respectively) located in the modelling assessment area shall be used for the evaluation of uncertainty of modelling. Note that the maximum ratio shall be interpreted as being applicable over the entire concentration range.

For short-term mean concentrations, the maximum uncertainty of measurement data used to assess the modelling quality objective shall be the absolute uncertainty calculated using the relative value expressed in this Section, above the limit value and shall decrease linearly from the absolute value at the limit value, to a threshold at zero concentration[86]. Both the short-term and long-term modelling quality objectives shall be fulfilled.

For modelling of annual mean concentrations of benzene, lead, arsenic, cadmium, nickel and benzo(a)pyrene, the maximum uncertainty of measurement data used for assessing the modelling quality objective shall not exceed the relative value expressed in this Section.

For modelling of annual mean concentrations of $PM_{2.5}$, PM_{10}, and nitrogen dioxide the maximum uncertainty of measurement data used for assessing the modelling quality objective shall not exceed either the absolute value or the relative value expressed in this Section.

Where an air quality model is used for assessment, references to descriptions of the model and information on the calculation of the modelling quality objective shall be compiled.

The uncertainty of objective estimation shall not exceed the uncertainty for indicative measurements by more than the applicable maximum ratio and shall not exceed 85%. The uncertainty for objective estimation is defined as the maximum deviation of the measured and calculated concentration levels, over the period considered, by the limit value (or ozone target value), without taking into account the timing of the events.

[86] The threshold shall be set to 4, 3, 10, 3 and 5 ug/m^3 for PM_{10}, $PM_{2.5}$, O_3, NO_2 and SO_2, respectively and 0.5 mg/m^3 for CO. These values represent the state of knowledge and shall be regularly updated at least every 5 years, to reflect developments in the state-of-art.

B. Data coverage of measurements for ambient air quality assessment

"Data coverage" refers to the proportion of the measurement period for which valid measurement data are available, expressed as a percentage.

Air pollutant	Minimum data coverage			
	Fixed measurements		Indicative measurements	
	Annual means	1-hour, 8-hour or 24-hour means (1)	Annual means	1-hour, 8-hour or 24-hour means (1)
SO_2, NO_2/NOx, CO, O_3	85 % (2)	75% (3)	13 %	50 % (4)
PM_{10}, $PM_{2.5}$	85 %	75%	13 %	50%
Benzene	85 %	-	13 %	-
Benzo(a)pyrene, polycyclic aromatic hydrocarbons (PAH), total gaseous mercury	30 %	-	13 %	-
As, Cd, Ni, Pb	45 %	-	13 %	-
BC, Ammonia (NH_3), UFP, particle size number distribution of UFP	80 %	-	13 %	-
Total Deposition	-	-	30%	-

(1) For O_3 and CO, the calculation of the 'maximum daily 8-hour mean' for any specific day requires a minimum 75% of the hourly running eight-hour averages (i.e. 18 eight-hour averages per day).

(2) For O_3, minimum data coverage requirements are to be met both for the full calendar year, and for the periods of April to September, and October to March, respectively.

Assessment of the AOT40 for ozone minimum data coverage requirements are to be met during the time period defined for calculating the AOT40 value.

(3) For the assessment of annual mean values, Member States may apply random measurements instead of continuous measurements if they can demonstrate to the Commission that the uncertainty, including the uncertainty due to random sampling, meets the quality objectives in the table and the time coverage is still larger than the minimum data coverage for indicative measurements. Random sampling must be evenly distributed over the year in order to avoid skewing of results. The uncertainty due to random sampling may be determined by the procedure laid down in ISO 11222 (2002) 'Air Quality — Determination of the Uncertainty of the Time Average of Air Quality Measurements'.

(4) For O_3, minimum data coverage applies for the period of April to September (no criterium of minimum data coverage is required during the winter period).

Fixed measurements of SO_2, NO_2, CO, O_3, PM_{10}, $PM_{2.5}$ and benzene are to be carried out continuously during the full calendar year.

For the other cases, measurements are to be evenly distributed over the calendar year (or over the April-September period for indicative measurements of O_3). In order to comply with these requirements and to ensure that any potential losses of data do not skew results, the minimum data coverage requirements shall be met for specific periods (quarter, month, weekday) of the whole year depending on the pollutant and measurement method/frequency.

For the assessment of annual mean values via indicative measurements, Member States may apply random measurements instead of continuous measurements if they can demonstrate that the uncertainty, including the uncertainty due to random sampling, meets the required data quality objectives and minimum data coverage for indicative measurements. Such random sampling shall be evenly distributed over the year in order to avoid skewing of results. The uncertainty due to random sampling may be determined by the procedure laid down in ISO 11222 (2002) 'Air Quality — Determination of the Uncertainty of the Time Average of Air Quality Measurements'.

The requirements for minimum data coverage do not include loss(es) of data due to the regular calibration or the normal maintenance of the instrumentation. Such maintenance shall not take place during pollution peak periods.

24-hour sampling is required for the measurement of benzo(a)pyrene and other polycyclic aromatic hydrocarbons. Individual samples taken over a period of up to 1 month may be combined and analysed as a composite sample, provided the method ensures that the samples are stable for that period. The three congeners benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene can be difficult to resolve analytically. In such cases, they can be reported as a sum together. Sampling must be spread evenly over the weekdays and the year. For the measurement of deposition rates monthly, or weekly, samples throughout the year are recommended.

Furthermore, those provisions on individual samples shall also apply to arsenic, cadmium, nickel and total gaseous mercury. Moreover, sub–sampling of PM_{10} filters for metals for subsequent analysis is allowed, providing there is evidence that the sub-sample is representative of the whole and that the detection sensitivity is not compromised when compared with the relevant data quality objectives. As an alternative to daily sampling, weekly sampling for metals in PM_{10} is allowed provided that the collection characteristics are not compromised.

Member States may use wet sampling only, instead of bulk sampling, if they can demonstrate that the difference between them is within 10 %. Deposition rates shall generally be given as $\mu g/m^2$ per day.

C. Methods for assessing compliance and estimating statistical parameters to account for low data coverage or significant data losses

An assessment of compliance with the relevant limit and ozone target value shall be carried out regardless of whether the data quality objectives are achieved, provided the available data allows for a conclusive assessment. In cases relating to the short-term limit and ozone target values, measurements that only cover a fraction of the calendar year, and that have not delivered sufficient valid data as required by Point B, may still constitute non-compliance. Where this is the case, and there are no clear grounds to doubt the quality of the valid data acquired, this shall be considered an exceedance of the limit or target value and be reported as such.

D. Results of air quality assessment

The following information shall be compiled for zones where air quality modelling or objective estimation is used:

(b) a description of assessment activities carried out,

(c) the specific methods used, with references to descriptions of the method,

(d) the sources of data and information,

(e) a description of results, including uncertainties and, in particular, the extent of any area or, if relevant, the length of road within the zone over which concentrations exceed any limit value, ozone target value or long-term objective, and of any area within which concentrations exceed the assessment threshold,

(f) the population potentially exposed to levels in excess of any limit value for protection of human health.

E. Quality assurance for ambient air quality assessment. Data validation

1. To ensure accuracy of measurements and compliance with the data quality objectives laid down in Point A, the appropriate competent authorities and bodies designated pursuant to Article 5 shall ensure the following:

(g) that all measurements undertaken in relation to the assessment of ambient air quality pursuant to Article 8 are traceable in accordance with the requirements set out in the harmonised standard for testing and calibration laboratories;

(h) that institutions operating networks and individual sampling points have an established quality assurance and quality control system which provides for regular maintenance to assure the continued accuracy of measuring devices. The quality system shall be reviewed as necessary and at least every 5 years by the relevant national reference laboratory;

(i) that a quality assurance/quality control process is established for the process of data collection and reporting and that organisations appointed for this task actively participate in the related Union-wide quality assurance programmes;

(j) that the national reference laboratories are appointed by the appropriate competent authority or body designated pursuant to Article 5 of this Directive and are accredited for the reference methods referred to in Annex VI to this Directive, at least for those pollutants for which concentrations are above the assessment threshold, according to the relevant harmonised standard for testing and calibration laboratories, the reference to which has been published in the *Official Journal of the European Union* pursuant to Article 2(9) of Regulation (EC) No 765/2008 of the European Parliament and of the Council[87] setting out the requirements for accreditation and market surveillance. These laboratories shall also be responsible for the coordination in Member State's territory of the Union-wide quality assurance programmes to be organised by the Commission's Joint Research Centre and shall also be responsible for coordinating, on the national level, the appropriate use of reference methods, and the demonstration

87 Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93 (OJ L 218, 13.8.2008, p. 30).

of equivalence of non-reference methods. National reference laboratories organising intercomparison on the national level shall also be accredited according to the relevant harmonised standard for proficiency testing;

(k) that the national reference laboratories take part at least every 3 years in the Union-wide quality assurance programmes organised by the Joint Research Centre for at least those pollutants for which concentrations are above the assessment threshold. Participation for other pollutants is recommended. If this participation produces unsatisfactory results, then the national laboratory shall demonstrate at the next participation in the intercomparison satisfactory remediation measures, and provide a report to the Joint Research Centre on these measures;

(l) that the national reference laboratories support the work done by the European network of National Reference Laboratories set up by the Commission's Joint Research Centre;

(m) that the European network of National Reference Laboratories be responsible for the periodic review, at least every 5 years, of the measurement uncertainties listed in the first two columns of Tables 1 and 2 of this Annex and subsequent proposal of any necessary changes to the Commission.

2. All reported data under Article 23 shall be deemed to be valid except data flagged as provisional.

F. Promotion of harmonised air quality modelling approaches

1. To promote and support the harmonised use of scientifically sound air quality modelling approaches by the competent authorities with an emphasis on model application, the appropriate competent authorities and bodies designated pursuant to Article 5 shall ensure the following:

(a) that the designated reference institutions participate in the European network of air quality modelling set up by the Commission's Joint Research Centre;

(b) that best practices in air quality modelling identified by the network through scientific consensus are adopted in relevant applications of air quality modelling for the purposes of fulfilling legal requirements pursuant to Union legislation, without prejudice to model adaptations necessitated by singular circumstances;

(c) that the quality of relevant applications of air quality modelling is periodically checked and improved through intercomparison exercises organised by the Commission’s Joint Research Centre;

(d) that the European network of air quality modelling be responsible for the periodic review, at least every 5 years, of the ratio of modelling uncertainties listed in the final columns of Tables 1 and 2 of this Annex and subsequent proposal of any necessary changes to the Commission.

ANNEX VI

REFERENCE METHODS FOR ASSESSMENT OF CONCENTRATIONS IN AMBIENT AIR AND DEPOSITION RATES

A. Reference methods for the assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM_{10} and $PM_{2.5}$), lead, benzene, carbon monoxide, arsenic, cadmium, mercury, nickel, polycyclic aromatic hydrocarbons, ozone and other pollutants in ambient air and deposition rates

1. Reference method for the measurement of sulphur dioxide in ambient air

The reference method for the measurement of sulphur dioxide is that described in EN 14212:2012 'Ambient air — Standard method for the measurement of the concentration of sulphur dioxide by ultraviolet fluorescence'.

2. Reference method for the measurement of nitrogen dioxide and oxides of nitrogen in ambient air

The reference method for the measurement of nitrogen dioxide and oxides of nitrogen is that described in EN 14211:2012 'Ambient air — Standard method for the measurement of the concentration of nitrogen dioxide and nitrogen monoxide by chemiluminescence'.

3. Reference method for the sampling and measurement of PM_{10} in ambient air

The reference method for the sampling and measurement of PM_{10} is that described in EN12341:2014 'Ambient Air — Standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2.5}$ mass concentration of suspended particulate matter'.

4. Reference method for the sampling and measurement of $PM_{2.5}$ in ambient air

The reference method for the sampling and measurement of $PM_{2.5}$ is that described in EN12341:2014 'Ambient Air — Standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2.5}$ mass concentration of suspended particulate matter'.

5. Reference method for the sampling and measurement of lead, arsenic, cadmium and nickel in ambient air

The reference method for the sampling of lead, arsenic, cadmium and nickel is that described in EN 12341:2014 'Ambient Air — Standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2.5}$ mass concentration of suspended particulate matter'. The reference method for the measurement of lead, arsenic, cadmium and nickel is that described in EN 14902:2005 'Standard method for measurement of Pb/Cd/As/Ni in the PM_{10} fraction of suspended particulate matter'.

6. Reference method for the sampling and measurement of benzene in ambient air

The reference method for the sampling and measurement of benzene is that described in EN 14662, parts 1 (2005), 2 (2005) and 3 (2016) 'Ambient air quality — Standard method for measurement of benzene concentrations'.

7. Reference method for the measurement of carbon monoxide in ambient air

The reference method for the measurement of carbon monoxide is that described in EN 14626:2012 'Ambient air — Standard method for the measurement of the concentration of carbon monoxide by non-dispersive infrared spectroscopy'.

8. Reference method for the sampling and measurement of polycyclic aromatic hydrocarbons in ambient air

The reference method for the sampling of polycyclic aromatic hydrocarbons in ambient air is described in EN 12341:2014 'Ambient Air — Standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2.5}$ mass concentration of suspended particulate matter'. The reference method for the measurement of benzo(a)pyrene in ambient air is that described in EN 15549:2008 'Air quality — Standard method for the measurement of concentration of benzo[a]pyrene in ambient air'. In the absence of a CEN standard method for the other polycyclic aromatic hydrocarbons referred to in Article 8(6), Member States are allowed to use national standard methods or ISO methods such as ISO standard 12884.

9. Reference method for the sampling and measurement of mercury in ambient air

The reference method for the measurement of total gaseous mercury concentrations in ambient air is that described in EN 15852:2010 'Ambient air quality — Standard method for the determination of total gaseous mercury'.

10. Reference method for the sampling and analysis of the deposition of arsenic, cadmium, nickel, mercury and polycyclic aromatic hydrocarbons

The reference method for the determination of the deposition of arsenic, cadmium, and nickel is that described in EN 15841:2009 'Ambient air quality — Standard method for determination of arsenic, cadmium, lead and nickel in atmospheric deposition'.

The reference method for the determination of the deposition of mercury is that described in EN 15853:2010 'Ambient air quality — Standard method for determination of mercury deposition'.

The reference method for the determination of the deposition of benzo(a)pyrene and the other polycyclic hydrocarbons referred to in Article 8(6) is that described in EN 15980:2011 'Air quality - Determination of the deposition of benz[a]anthracene, benzo[b]fluoranthene, benzo[j]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, dibenz[a,h]anthracene and indeno[1,2,3-cd]pyrene'.

11. Reference method for the measurement of ozone in ambient air

The reference method for the measurement of ozone is that described in EN 14625:2012 'Ambient air — Standard method for the measurement of the concentration of ozone by ultraviolet photometry'.

12. Reference method for the sampling and measurement of volatile organic compounds that are ozone precursor substances in ambient air

In the absence of a European Committee for Standardization (CEN) standard method for sampling and measuring volatile organic compounds that are ozone precursor substances in ambient air other than benzene, Member States may choose the sampling and measuring methods they use, in accordance with Annex V and taking into account the measurement objectives set out in Section 2, Point A, of Annex VII.

13. Reference method for the sampling and measurement of elemental carbon and organic carbon in ambient air

The reference method for the sampling of elemental carbon and organic carbon is that describe in EN 12341:2014 'Ambient Air — Standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2.5}$ mass concentration of suspended particulate matter'. The reference method for the measurement of elemental carbon and organic

carbon in ambient air is that described in EN 16909:2017 ‘Ambient air - Measurement of elemental carbon (EC) and organic carbon (OC) collected on filters’.

14. Reference method for the sampling and measurement of NO_3^-, SO_4^{2-}, Cl^-, NH_4^+, Na^+, K^+, Mg^{2+}, Ca^{2+} in $PM_{2.5}$ in ambient air

The reference method for the sampling of elemental carbon and organic carbon is that describe in EN 12341:2014 ‘Ambient Air — Standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2.5}$ mass concentration of suspended particulate matter’. The reference method for the measurement of NO_3^-, SO_4^{2-}, Cl^-, NH_4^+, Na^+, K^+, Mg^{2+}, Ca^{2+} in $PM_{2.5}$ in ambient air is that described in EN 16913:2017 ’Ambient air - Standard method for measurement of NO_3^-, SO_4^{2-}, Cl^-, NH_4^+, Na^+, K^+, Mg^{2+}, Ca^{2+} in $PM_{2.5}$ as deposited on filters’.

B. Demonstration of equivalence

1. A Member State may use any other method which it can demonstrate gives results equivalent to any of the reference methods referred to in Point A or, in the case of particulate matter, any other method which the Member State concerned can demonstrate displays a consistent relationship to the reference method. In that event, the results achieved by such other method must be corrected to produce results equivalent to those that would have been achieved by using the reference method.

2. The Commission may require Member States to prepare and submit a report on the demonstration of equivalence in accordance with point 1.

3. When assessing the acceptability of the report mentioned in point 2, the Commission will refer to its guidance on the demonstration of equivalence. Where Member States have been using interim factors to approximate equivalence, approximate equivalence shall be confirmed or amended with reference to that guidance.

4. Member States shall ensure that whenever appropriate, the correction is also applied retroactively to past measurement data in order to achieve better data comparability.

C. Standardisation

For gaseous pollutants, the volume must be standardised at a temperature of 293 K and an atmospheric pressure of 101,3 kPa. For particulate matter and substances to be analysed in particulate matter (including lead, arsenic, cadmium, and benzo(a)pyrene), the sampling volume refers to ambient conditions in terms of temperature and atmospheric pressure at the date of measurements.

When demonstrating that equipment meets the performance requirements of the reference methods listed in Point A, the competent authorities and bodies designated pursuant to Article 5 shall accept test reports issued in other Member States provided that the test laboratories are accredited by the relevant harmonised standard for testing and calibration laboratories.

The detailed test reports and all the results of the tests shall be available to other competent authorities or their designated bodies. Test reports shall demonstrate that the equipment meets all the performance requirements including where some environmental and site conditions are specific to a Member State and are outside the conditions for which the equipment has been already tested and type approved in another Member State.

D. Mutual recognition of data

When demonstrating that equipment meets the performance requirements of the reference methods listed in Point A, the competent authorities and bodies designated pursuant to Article 5 shall accept test reports issued in other Member States provided that the test laboratories are accredited by the relevant harmonised standard for testing and calibration laboratories.

The detailed test reports and all the results of the tests shall be available to other competent authorities or their designated bodies. Test reports shall demonstrate that the equipment meets all the performance requirements including where some environmental and site conditions are specific to a Member State and are outside the conditions for which the equipment has been already tested and type approved in another Member State.

E. Reference air quality modelling applications

In the absence of a CEN standard on modelling quality objectives, Member States may choose the modelling applications they use, in accordance with Annex V, Section F.

ANNEX VII

MONITORING OF MASS CONCENTRATION AND CHEMICAL COMPOSITION OF $PM_{2.5}$, OZONE PRECURSOR SUBSTANCES AND ULTRAFINE PARTICLES

SECTION 1 - MEASUREMENTS OF MASS CONCENTRATION AND CHEMICAL COMPOSITION OF $PM_{2,5}$

A. Objectives

The main objectives of such measurements are to ensure that adequate information is made available on levels in urban background and rural background locations. This information is essential to judge the enhanced levels in more polluted areas (such as urban background, industry related locations, traffic related locations), assess the possible contribution from long-range transport of pollutants, support source apportionment analysis and for the understanding of specific pollutants such as particulate matter. It is also essential for the increased use of modelling also in urban areas.

B. Substances

Measurement of $PM_{2.5}$ must include at least the total mass concentration and concentrations of appropriate compounds to characterise its chemical composition. At least the list of chemical species given below shall be included.

SO_4^{2-}	Na^+	NH_4^+	Ca^{2+}	elemental carbon (EC)
NO_3^-	K^+	Cl^-	Mg^{2+}	organic carbon (OC)

C. Siting

Measurements shall be taken in urban background and rural background locations in accordance with Annex IV.

SECTION 2- MEASUREMENTS OF OZONE PRECURSOR SUBSTANCES

A. Objectives

The main objectives of measurements of ozone precursor substances are to analyse any trend in ozone precursors, to check the efficiency of emission reduction strategies, to check the consistency of emission inventories, to support the understanding of ozone formation and precursor dispersion processes, as well as the application of photochemical models, and to help attribute emission sources to observed pollution concentrations.

B. Substances

Measurement of ozone precursor substances shall include at least nitrogen oxides (NO and NO_2), and appropriate volatile organic compounds (VOC). The selection of the specific compounds to be measured completed by other compounds of interest will depend on the objective sought.

(a) Member States may use the method which it considers suitable for the objective sought;

(b) the reference method as specified under Annex VI applies for nitrogen dioxide and oxides of nitrogen;

(c) methods that are being standardised by the CEN shall be used once available.

A list of VOC recommended for measurement is given below:

Chemical family	**Substance**			
	Trivial name	**IUPAC name**	**Formula**	**CAS number**
Alcohols	Methanol	Methanol	CH_4O	67-56-1
	Ethanol	Ethanol	C_2H_6O	64-17-5
Aldehyde	Formaldehyde	Methanal	CH_2O	50-00-0
	Acetaldehyde	Ethanal	C_2H_4O	75-07-0
	Methacrolein	2-Methylprop-2-enal	C_4H_6O	78-85-3
Alkynes	Acetylene	Ethyne	C_2H_2	74-86-2
Alkanes	Ethane	Ethane	C_2H_6	74-84-0
	Propane	Propane	C_3H_8	74-98-6
	n-Butane	Butane	C_4H_{10}	106-97-8
	i-Butane	2-Methylpropane	C_4H_{10}	75-28-5
	n-Pentane	Pentane	C_5H_{12}	109-66-0
	i-Pentane	2-Methylbutane	C_5H_{12}	78-78-4
	n-Hexane	Hexane	C_6H_{14}	110-54-3
	i-Hexane	2-Methylpentane	C_6H_{14}	107-83-5
	n-Heptane	Heptane	C_7H_{16}	142-82-5
	n-Octane	Octane	C_8H_{18}	111-65-9
	i-Octane	2,2,4-Trimethylpentane	C_8H_{18}	540-84-1
Alkenes	Ethylene	Ethene	C_2H_4	75-21-8
	Propene / Propylene	Propene	C_3H_6	115-07-1
	1,3-Butadiene	Buta-1,3-diene	C_4H_6	106-99-0
	1-Butene	But-1-ene	C_4H_8	106-98-9

	Trans-2-Butene	(E)-but-2-ene	C_4H_8	624-64-6
	cis-2-Butene	(Z)-but-2-ene	C_4H_8	590-18-1
	1-Pentene	Pent-1-ene	C_5H_{10}	109-67-1
	2-Pentene	(Z)-Pent-2-ene	C_5H_{10}	627-20-3 (cis-2 pentene)
		(E)-Pent-2-ene		646-04-8 (trans-2 pentene)
Aromatic hydrocarbons	Benzene	Benzene	C_6H_6	71-43-2
	Toluene / Methylbenzene	Toluene	C_7H_8	108-88-3
	Ethyl benzene	Ethylbenzene	C_8H_{10}	100-41-4
	m + p-Xylene	1,3-Dimethylbenzene (m-Xylene)	C_8H_{10}	108-38-3 (m-Xylene)
		1,4-Dimethylbenzene (p-Xylene)		106-42-3 (p-Xylene)
	o-Xylene	1,2-Dimethylbenzene (o-Xylene)	C_8H_{10}	95-47-6
	1,2,4-Trimethylebenzene	1,2,4-Trimethylbenzene	C_9H_{12}	95-63-6
	1,2,3-Trimethylebenzene	1,2,3-Trimethylbenzene	C_9H_{12}	526-73-8
	1,3,5-Trimethylebenzene	1,3,5-Trimethylebenzene	C_9H_{12}	108-67-8
Ketones	Acetone	Propan-2-one	C_3H_6O	67-64-1
	Methyl ethyl ketone	Butan-2-one	C_4H_8O	78-93-3
	Methyl vinyl ketone	3-Buten-2-one	C_4H_6O	78-94-4
Terpenes	Isoprene	2-Methylbut-1,3-diene	C_5H_8	78-79-5
	p-Cymene	1-Methyl-4-(1-methylethyl)benzene	$C_{10}H_{14}$	99-87-6
	Limonene	1-methyl-4-(1-methylethenyl)-cyclohexene	$C_{10}H_{16}$	138-86-3
	β-Myrcene	7-Methyl-3-methylene-1,6-octadiene	$C_{10}H_{16}$	123-35-3
	α-Pinene	2,6,6-Trimethyl-bicyclo[3.1.1]hept-2-ene	$C_{10}H_{16}$	80-56-8
	β-Pinene	6,6-Dimethyl-2-methyl-enebicyclo[3.1.1]heptane	$C_{10}H_{16}$	127-91-3

	Camphene	2,2-dimethyl-3-methyl-enebicyclo[2.2.1]heptane	$C_{10}H_{16}$	79-92-5
	Δ^3-Carene	3,7,7-Trimethyl-bicyclo[4.1.0]hept-3-ene	$C_{10}H_{16}$	13466-78-9
	1,8-Cineol	1,3,3 trimethyl 2 oxabicyclo[2,2,2]octane	$C_{10}H_{18}O$	470-82-6

C. Siting

Measurements shall be taken at sampling points set up in accordance with the requirements of this Directive and considered appropriate with regards to the monitoring objectives referred to in Point A of this Section.

SECTION 3- MEASUREMENT OF ULTRAFINE PARTICULES (UFP)

A. Objectives

The objective of such measurements is to ensure that adequate information is available at locations where high concentrations of UFP occur that are mainly influenced by sources from air, water or road transport (such as airports, ports, roads), industrial sites or domestic heating. The information shall be appropriate to judge on enhanced levels of UFP concentrations from those sources.

B. Substances

UFP.

C. Siting

Sampling points shall be established in accordance with Annex IV and V at a location where high UFP concentrations are likely to occur and within the main wind direction.

ANNEX VIII

INFORMATION TO BE INCLUDED IN AIR QUALITY PLANS FOR IMPROVEMENT IN AMBIENT AIR QUALITY

A. Information to be provided under Article 19(5)

1. Localisation of excess pollution

   (a) region;

   (b) city (map);

   (c) sampling point(s) (map, geographical coordinates).

2. General information

   (a) type of zone (urban, industrial or rural area) or characteristics of NUTS 1 territorial unit (including urban, industrial or rural areas);

   (b) estimate of the polluted area (in km^2) and of the population exposed to the pollution;

   (c) concentrations or average exposure indicator of the relevant pollutant observed at least 5 years prior to the exceedance;

3. Responsible authorities

   Names and addresses of the competent authorities responsible for the development and implementation of air quality plans.

4. Origin of pollution taking into account reporting under Directive (EU) 2016/2284 and information provided in the national air pollution control programme

   (a) list of the main emission sources responsible for pollution;

   (b) total quantity of emissions from these sources (in tonnes/year);

   (c) assessment of the level of emissions (e.g. city level, regional level, national level, and transboundary contributions);

   (d) source apportionment according to relevant sectors that contribute to the exceedance in the national air pollution control programme.

5. Expected impact of measures to reach compliance within 3 years after adoption of the air quality plan

   (a) expected quantified concentration reduction (in $\mu g/m^3$) at each sampling point in exceedance of limit values, ozone target value or of the average exposure indicator in case of an exceedance of the average exposure reduction obligation, from the measures referred to in point 6;

   (b) estimated year of compliance per air pollutant covered by the air quality plan taking into account measures referred to in point 6.

6. Annex 1: Details of measures to reduce air pollution under point 5

(c) listing and description of all the measures set out in the air quality plan, including the identification of the competent authority in charge of their implementation;

(d) quantification of emission reduction (in tonnes/year) of each measure under point (a);

(e) timetable for implementation of each measure and responsible actors;

(f) estimate of the concentration reduction as a consequence of each air quality measure, in relation to the exceedance concerned;

(g) list of the information (including modelling and assessment results of measures) to reach the air quality standard concerned in accordance with Annex I.

7. Annex 2: Further background information

(h) climatic data;

(i) data on topography;

(j) information on the type of targets requiring protection in the zone, (if applicable);

(k) listing and description of all additional measures, that unfold their full impact on ambient air pollutant concentrations in 3 years or more.

8. Annex 3: Evaluation of measures (in case of an air quality plan update)

(l) assessment of timetable of measures from the previous air quality plan;

(m) estimate of impact on emission reduction and pollutant concentrations of measures from the previous air quality plan.

B. Indicative list of air pollution abatement measures

1. Information concerning the status of implementation of the Directives referred to in Article 14(3), point (b), of Directive (EU) 2016/2284.

2. Information on all air pollution abatement measures that have been considered at local, regional or national level for implementation in connection with the attainment of air quality objectives, including:

(a) reduction of emissions from stationary sources by ensuring that polluting small and medium-sized stationary combustion sources (including for biomass) are fitted with emission control equipment or replaced, and that the energy efficiency of buildings is improved;

(b) reduction of emissions from vehicles through retrofitting with zero emissions powertrains and emission control equipment. The use of economic incentives to accelerate take-up shall be considered;

(c) procurement by public authorities, in line with the handbook on environmental public procurement, of zero emissions road vehicles, fuels and combustion equipment to reduce emissions;

(d) measures to limit transport emissions through traffic planning and management (including congestion pricing, differentiated parking fees or other economic incentives; establishing urban vehicles access restrictions schemes, including low emission zones);

(e) measures to encourage a shift towards less polluting forms of transport;

(f) measures to encourage a shift towards zero emissions vehicles and non-road machinery for both private and commercial applications;

(g) measure to ensure that low emission fuels are given preference in small-, medium- and large-scale stationary sources and in mobile sources;

(h) measures to reduce air pollution from industrial sources under Directive 2010/75/EU, and through the use of economic instruments such as taxes, charges or emission trading, while taking into account specificities of SMEs;

(i) measures to protect the health of children or other sensitive population groups.

ANNEX IX

PUBLIC INFORMATION

1. Member States shall provide at least the following information:

   (a) hourly up-to-date data per sampling point of sulphur dioxide, nitrogen dioxide, particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide and ozone. This shall apply to information from all sampling points where up-to-date information is available, and at least to information from the minimum number of sampling points required under Annex III. When available, up-to-date information resulting from modelling shall also be provided;

   (b) measured concentrations of all pollutants presented according to the appropriate periods as laid down in Annex I;

   (c) information on observed exceedance(s) of any limit value, ozone target value, and average exposure reduction obligation, including at least:

      (i) the location or area of the exceedance,

      (ii) the start time and duration of the exceedance,

      (iii) the measured concentration in comparison to the air quality standards, or average exposure indicator in case of an exceedance of the average exposure reduction obligation;

   (d) information regarding on health and vegetation, including at least:

      (i) the health impacts of air pollution on general population,

      (ii) the health impacts of air pollution on vulnerable groups,

      (iii) description of likely symptoms,

      (iv) recommended precautions to be taken,

      (v) where to find further information;

   (e) information on preventive actions to reduce pollution and exposure to it: indication of main source sectors; recommendations for actions to reduce emissions;

   (f) information on measuring campaigns or similar activities and their results where performed.

2. Member States shall ensure that timely information about actual or predicted exceedances of alert thresholds, and any information threshold, is provided to the public. Details supplied shall include at least the following information:

   (a) information on observed exceedance(s):

      – location or area of the exceedance,

      – type of threshold exceeded (information or alert),

      – start time and duration of the exceedance,

      – highest one hour concentration and in addition highest eight hour mean concentration in the case of ozone;

   (b) forecast for the following afternoon/day(s):

– geographical area of expected exceedances of information and/or alert threshold,

– expected changes in pollution (improvement, stabilisation or deterioration), together with the reasons for those changes;

(c) information on the type of population concerned, possible health effects and recommended behaviour:

– information on population groups at risk,

– description of likely symptoms,

– recommended precautions to be taken by the population concerned,

– where to find further information;

(d) information on preventive action to reduce pollution and/or exposure to it: indication of main source sectors; recommendations for action to reduce emissions;

(e) in the case of predicted exceedances, Member State shall take steps to ensure that such details are supplied to the extent practicable.

3. When an exceedance occur or when there is a risk of exceedance of any limit value, ozone target value, average exposure reduction obligation, alert thresholds or information thresholds, Member States shall ensure that the information referred to in this Annex is additionally promoted to the public.

ANNEX X

Part A

Repealed Directives with lists of the successive amendments thereto (referred to in Article 30)

Directive 2004/107/EC of the European Parliament and of the Council (OJ L 23, 26.1.2005, p. 3)	
Regulation (EC) No 219/2009 of the European Parliament and of the Council (OJ L 87, 31.3.2009, p. 109)	only point 3.8 of the Annex
Commission Directive (EU) 2015/1480 (OJ L 226, 29.8.2015, p. 4)	only Article 1
Directive 2008/50/EC of the European Parliament and of the Council (OJ L 152, 11.6.2008, p. 1)	
Commission Directive (EU) 2015/1480 (OJ L 226, 29.8.2015, p. 4)	only Article 2

Part B

Time-limits for transposition into national law (referred to in Article 30)

Directive	Time-limit for transposition
2004/107/EC	15 February 2007
2008/50/EC	11 June 2010
(EU) 2015/1480	31 December 2016

ANNEX XI

CORRELATION TABLE

This Directive	Directive 2008/50/EC	Directive 2004/107/EC
Article 1	—	—
Article 2	Article 1	Article 1
Article 3	Article 32	Article 8
Article 4	Article 2	Article 2
Article 5	Article 3	—
Article 6	Article 4	Article 4(1)
Article 7	Articles 5 and 9(2)	Article 4(2), (3) and (6)
Article 8	Articles 6 and 9(1)	Article 4(1) to (5) and 4(8)and (10)
Article 9	Articles 7 and 10	Article 4(7) and (11)
Article 10	—	Article 4(9)
Article 11	Articles 8 and 11	Article 4(12) and (13)
Article 12	Articles 12, 17(1) and (3) and Article 18	Article 3(2)
Article 13	Articles 13, 15 and 17(1)	Article 3(1) and (3)
Article 14	Article 14	—
Article 15	Article 19	—
Article 16	Article 20	—
Article 17	Article 21	—
Article 18	Article 22	
Article 19	Articles 17(2) and 23	Article 3(3)
Article 20	Article 24	—
Article 21	Article 25	—
Article 22	Article 26	Article 7

Article 23	Article 27	Article 5
Article 24	Article 28	Article 4(15)
Article 25	—	—
Article 26	Article 29	Article 6
Article 27	—	—
Article 28	—	—
Article 29	Article 30	Article 9
Article 30	Article 31	—
Article 31	—	—
Article 32	Article 33	Article 10
Article 33	Article 34	Article 11
Article 34	Article 35	Article 12

↓ 2004/107

ANNEX IV

Data quality objectives and requirements for air quality models

I. DATA QUALITY OBJECTIVES

The following data quality objectives are provided as a guide to quality assurance.

↓ 2015/1480 Art. 1 and Annex I.1(a)

	Benzo(a)pyrene	Arsenic, cadmium and nickel	Polycyclic aromatic hydrocarbons other than benzo(a)pyrene, total gaseous mercury	Total deposition
— Uncertainty				
Fixed and indicative measurements	50 %	40 %	50 %	70 %

Modelling	60 %	60 %	60 %	60 %
— Minimum data capture	90 %	90 %	90 %	90 %
— Minimum time coverage				
Fixed measurements[88]	33 %	50 %		
Indicative measurements[89][90]	14 %	14 %	14 %	33 %

↓ 2004/107/EC
→1 2015/1480 Art. 1 and Annex I.1(b)

The uncertainty (expressed at a 95 % confidence level) of the methods used for the assessment of ambient air concentrations will be evaluated in accordance with the principles of the CEN Guide to the expression of uncertainty in measurement (ENV 13005-1999), the methodology of ISO 5725:1994, and the guidance provided in the CEN Report, 'Air quality — Approach to uncertainty estimation for ambient air reference measurement methods' (CR 14377:2002E). The percentages for uncertainty are given for individual measurements, which are averaged over typical sampling times, for a 95 % confidence interval. The uncertainty of the measurements should be interpreted as being applicable in the region of the appropriate target value. Fixed and indicative measurements must be evenly distributed over the year in order to avoid skewing of results.

The requirements for minimum data capture and time coverage do not include losses of data due to regular calibration or normal maintenance of the instrumentation. Twenty-four-hour sampling is required for the measurement of benzo(a)pyrene and other polycyclic aromatic hydrocarbons. With care, individual samples taken over a period of up to one month can be combined and analysed as a composite sample, provided the method ensures that the samples are stable for that period. The three congeners benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene can be difficult to resolve analytically. In such cases they can be reported as sum.→1 --- ← Sampling must be spread evenly over the weekdays and the year. For the measurement of deposition rates monthly, or weekly, samples throughout the year are recommended.

88 Distributed over the year to be representative of various conditions for climate and anthropogenic activities

89 Distributed over the year to be representative of various conditions for climate and anthropogenic activities

90 Indicative measurement being measurements which are performed at reduced regularity but fulfil the other data quality objectives

↓ 2015/1480 Art. 1 and Annex I.1(c)

~~The provisions on individual samples in the previous paragraph apply also to arsenic, cadmium, nickel and total gaseous mercury. Moreover, sub-sampling of PM_{10} filters for metals for subsequent analysis is allowed, providing there is evidence that the sub-sample is representative of the whole and that the detection sensitivity is not compromised when compared with the relevant data quality objectives. As an alternative to daily sampling, weekly sampling for metals in PM_{10} is allowed provided that the collection characteristics are not compromised.~~

↓ 2004/107/EC

~~Member States may use wet only instead of bulk sampling if they can demonstrate that the difference between them is within 10 %. Deposition rates should generally be given as µg/m^2 per day.~~

~~Member States may apply a minimum time coverage lower than indicated in the table, but not lower than 14 % for fixed measurements and 6 % for indicative measurements provided that they can demonstrate that the 95 % expanded uncertainty for the annual mean, calculated from the data quality objectives in the table according to ISO 11222:2002 — 'Determination of the uncertainty of the time average of air quality measurements' will be met.~~

~~II. REQUIREMENTS FOR AIR QUALITY MODELS~~

~~Where an air quality model is used for assessment, references to descriptions of the model and information on the uncertainty shall be compiled. The uncertainty for modelling is defined as the maximum deviation of the measured and calculated concentration levels, over a full year, without taking into account the timing of the events.~~

~~III. REQUIREMENTS FOR OBJECTIVE ESTIMATION TECHNIQUES~~

~~Where objective estimation techniques are used, the uncertainty shall not exceed 100 %.~~

~~IV. STANDARDISATION~~

~~For substances to be analysed in the PM_{10} fraction, the sampling volume refers to ambient conditions.~~

↓ 2004/107

~~ANNEX V~~

~~Reference methods for assessment of concentrations in ambient air and deposition rates~~

↓ 2015/1480 Art. 1 and Annex I.2

~~I. REFERENCE METHOD FOR THE SAMPLING AND ANALYSIS OF ARSENIC, CADMIUM AND NICKEL IN AMBIENT AIR~~

~~The reference method for the sampling of arsenic, cadmium and nickel in ambient air is described in EN 12341:2014. The reference method for the measurement of arsenic, cadmium and nickel in ambient air is that described in EN 14902:2005 'Ambient air quality — Standard method for the measurement of Pb, Cd, As and Ni in the PM10 fraction of suspended particulate matter'.~~

~~A Member State may also use any other methods which it can demonstrate give results equivalent to the above method.~~

~~II. REFERENCE METHOD FOR THE SAMPLING AND ANALYSIS OF POLYCYCLIC AROMATIC HYDROCARBONS IN AMBIENT AIR~~

~~The reference method for the sampling of polycyclic aromatic hydrocarbons in ambient air is described in EN 12341:2014. The reference method for the measurement of benzo(a)pyrene in ambient air is that described in EN 15549:2008 'Air quality — Standard method for the measurement of concentration of benzo[a]pyrene in ambient air'. In the absence of a CEN standard method for the other polycyclic aromatic hydrocarbons referred to in Article 4(8), Member States are allowed to use national standards methods or ISO methods such as ISO standard 12884.~~

~~A Member State may also use any other method which it can demonstrate give results equivalent to the above method.~~

~~III. REFERENCE METHOD FOR THE SAMPLING AND ANALYSIS OF MERCURY IN AMBIENT AIR~~

~~The reference method for the measurement of total gaseous mercury concentrations in ambient air is that described in EN 15852:2010 'Ambient air quality — Standard method for the determination of total gaseous mercury'.~~

~~A Member State may also use any other method which it can demonstrate give results equivalent to the above method.~~

~~IV. REFERENCE METHOD FOR THE SAMPLING AND ANALYSIS OF THE DEPOSITION OF ARSENIC, CADMIUM, MERCURY, NICKEL AND POLYCYCLIC AROMATIC HYDROCARBONS~~

~~The reference method for the determination of the deposition of arsenic, cadmium, and nickel is that described in EN 15841:2009 'Ambient air quality — Standard method for determination of arsenic, cadmium, lead and nickel in atmospheric deposition'.~~

~~The reference method for the determination of the deposition of mercury is that described in EN 15853:2010 'Ambient air quality — Standard method for determination of mercury deposition'.~~

~~The reference method for the determination of the deposition of benzo(a)pyrene and the other polycyclic hydrocarbons referred to in Article 4(8) is that described in EN 15980:2011 'Air quality. Determination of the deposition of benz[a]anthracene, benzo[b]fluoranthene, benzo[j]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, dibenz[a,h]anthracene and indeno[1,2,3-cd]pyrene'.~~

↓ 219/2009 Art. 1 and Annex .3(8)

~~**V. REFERENCE AIR QUALITY MODELLING TECHNIQUES**~~

~~Reference air quality modelling techniques cannot be specified at present. The Commission may make amendments to adapt this point to scientific and technical progress. Those measures, designed to amend non-essential elements of this Directive, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 6(3).~~

↓ 2008/50

ANNEX I

DATA QUALITY OBJECTIVES

A. DATA QUALITY OBJECTIVES FOR AMBIENT AIR QUALITY ASSESSMENT

	Sulphur dioxide, nitrogen dioxide and oxides of nitrogen and carbon monoxide	Benzene	Particulate matter (PM_{10}/$PM_{2,5}$) and lead	Ozone and related NO and NO_2
Fixed measurements[91]				
Uncertainty	15 %	25 %	25 %	15 %
Minimum data capture	90 %	90 %	90 %	90 % during summer 75 % during winter
Minimum time coverage:				
— urban background and traffic	—	35 %[92]	—	—
— industrial sites	—	90 %	—	—
Indicative measurements				
Uncertainty	25 %	30 %	50 %	30 %
Minimum data capture	90 %	90 %	90 %	90 %

[91] Member States may apply random measurements instead of continuous measurements for benzene, lead and particulate matter if they can demonstrate to the Commission that the uncertainty, including the uncertainty due to random sampling, meets the quality objective of 25 % and the time coverage is still larger than the minimum time coverage for indicative measurements. Random sampling must be evenly distributed over the year in order to avoid skewing of results. The uncertainty due to random sampling may be determined by the procedure laid down in ISO 11222 (2002) 'Air Quality — Determination of the Uncertainty of the Time Average of Air Quality Measurements'. If random measurements are used to assess the requirements of the PM_{10} limit value, the 90,4 percentile (to be lower than or equal to 50 $\mu g/m^3$) should be evaluated instead of the number of exceedances, which is highly influenced by data coverage.

[92] Distributed over the year to be representative of various conditions for climate and traffic.

Minimum time coverage	14 %[93]	14 %[94]	14 %[95]	≥ 10 % during summer
Modelling uncertainty:				
Hourly	50 %	—	—	50 %
Eight-hour averages	50 %	—	—	50 %
Daily averages	50 %	—	not yet defined	—
Annual averages	30 %	50 %	50 %	—
Objective estimation				
Uncertainty	75 %	100 %	100 %	75 %

The uncertainty (expressed at a 95 % confidence level) of the assessment methods will be evaluated in accordance with the principles of the CEN Guide to the Expression of Uncertainty in Measurement (ENV 13005-1999), the methodology of ISO 5725:1994 and the guidance provided in the CEN report 'Air Quality — Approach to Uncertainty Estimation for Ambient Air Reference Measurement Methods' (CR 14377:2002E). The percentages for uncertainty in the above table are given for individual measurements averaged over the period considered by the limit value (or target value in the case of ozone), for a 95 % confidence interval. The uncertainty for the fixed measurements shall be interpreted as being applicable in the region of the appropriate limit value (or target value in the case of ozone).

The uncertainty for modelling is defined as the maximum deviation of the measured and calculated concentration levels for 90 % of individual monitoring points, over the period considered, by the limit value (or target value in the case of ozone), without taking into account the timing of the events. The uncertainty for modelling shall be interpreted as being applicable in the region of the appropriate limit value (or target value in the case of ozone). The fixed measurements that have to be selected for comparison with modelling results shall be representative of the scale covered by the model.

The uncertainty for objective estimation is defined as the maximum deviation of the measured and calculated concentration levels, over the period considered, by the limit value (or target value in the case of ozone), without taking into account the timing of the events.

The requirements for minimum data capture and time coverage do not include losses of data due to the regular calibration or the normal maintenance of the instrumentation.

93 One measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year.

94 One day's measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year.

95 One measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year.

B. RESULTS OF AIR QUALITY ASSESSMENT

The following information shall be compiled for zones or agglomerations within which sources other than measurement are employed to supplement information from measurement or as the sole means of air quality assessment:

– a description of assessment activities carried out,

– the specific methods used, with references to descriptions of the method,

– the sources of data and information,

– a description of results, including uncertainties and, in particular, the extent of any area or, if relevant, the length of road within the zone or agglomeration over which concentrations exceed any limit value, target value or long-term objective plus margin of tolerance, if applicable, and of any area within which concentrations exceed the upper assessment threshold or the lower assessment threshold,

– the population potentially exposed to levels in excess of any limit value for protection of human health.

↓ 2015/1480 Art. 2 and Annex II.1

C. QUALITY ASSURANCE FOR AMBIENT AIR QUALITY ASSESSMENT. DATA VALIDATION

1. To ensure accuracy of measurements and compliance with the data quality objectives laid down in Section A, the appropriate competent authorities and bodies designated pursuant to Article 3 shall ensure the following:

(i) that all measurements undertaken in relation to the assessment of ambient air quality pursuant to Articles 6 and 9 are traceable in accordance with the requirements set out in the harmonised standard for testing and calibration laboratories,

(ii) that institutions operating networks and individual stations have an established quality assurance and quality control system which provides for regular maintenance to assure the continued accuracy of measuring devices. The quality system shall be reviewed as necessary and at least every five years by the relevant National Reference Laboratory

(iii) that a quality assurance/quality control process is established for the process of data collection and reporting and that institutions appointed for this task actively participate, in the related Union-wide quality assurance programmes,

(iv) that the National Reference Laboratories are appointed by the appropriate competent authority or body designated pursuant to Article 3 and are accredited for the reference methods referred to in Annex VI, at least for those pollutants for which concentrations are above the lower assessment threshold, according to the relevant harmonised standard for testing and calibration laboratories, the reference to which has been published in the *Official Journal of the European Union* pursuant to Article 2(9) of Regulation (EC) No 765/2008 setting out the requirements for accreditation and market surveillance. These laboratories shall also be responsible for the coordination in Member State's territory of the Union-wide quality assurance programmes to be organised by the Commission's Joint Research Centre and shall also be responsible for coordinating, on the national level, the appropriate use of reference methods, and the demonstration of equivalence of non-reference methods.

National Reference Laboratories organising intercomparison on the national level should also be accredited according to the relevant harmonised standard for proficiency testing.

(v) that the National Reference Laboratories, take part at least every three years in the Union-wide quality assurance programmes organized by the Commission's Joint Research Centre. If this participation produces unsatisfactory results then the national laboratory should demonstrate at the next participation in the intercomparison satisfactory remediation measures, and provide a report to the Joint Research Centre on these.

(vi) that the national reference laboratories support the work done by the European network of National Reference Laboratories set up by the Commission.

2. All reported data under Article 27 shall be deemed to be valid except data flagged as provisional.

↓ 2008/50/EC

ANNEX II

Determination of requirements for assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM_{10} and $PM_{2,5}$), lead, benzene and carbon monoxide in ambient air within a zone or agglomeration

A. UPPER AND LOWER ASSESSMENT THRESHOLDS

The following upper and lower assessment thresholds will apply:

1. Sulphur dioxide

	Health protection	Vegetation protection
Upper assessment threshold	60 % of 24-hour limit value (75 µg/m³, not to be exceeded more than 3 times in any calendar year)	60 % of winter critical level (12 µg/m³)
Lower assessment threshold	40 % of 24-hour limit value (50 µg/m³, not to be exceeded more than three times in any calendar year)	40 % of winter critical level (8 µg/m³)

2. Nitrogen dioxide and oxides of nitrogen

	Hourly limit value for the protection of human health (NO_2)	Annual limit value for the protection of human health (NO_2)	Annual critical level for the protection of vegetation and natural ecosystems (NO_x)
Upper assessment threshold	70 % of limit value (140 µg/m³, not to be exceeded more than 18 times in any calendar year)	80 % of limit value (32 µg/m³)	80 % of critical level (24 µg/m³)
Lower assessment threshold	50 % of limit value (100 µg/m³, not to be exceeded more than 18 times in any calendar year)	65 % of limit value (26 µg/m³)	65 % of critical level (19,5 µg/m³)

3. Particulate matter (PM_{10}/$PM_{2,5}$)

	24-hour average PM_{10}	Annual average PM_{10}	Annual average $PM_{2,5}$[96]
Upper assessment threshold	70 % of limit value (35 µg/m³, not to be exceeded more than 35 times in any calendar year)	70 % of limit value (28 µg/m³)	70 % of limit value (17 µg/m³)
Lower assessment threshold	50 % of limit value (25 µg/m³, not to be exceeded more than 35 times in any calendar year)	50 % of limit value (20 µg/m³)	50 % of limit value (12 µg/m³)

4. Lead

	Annual average
Upper assessment threshold	70 % of limit value (0,35 µg/m³)
Lower assessment threshold	50 % of limit value (0,25 µg/m³)

5. Benzene

	Annual average
Upper assessment threshold	70 % of limit value (3,5 µg/m³)
Lower assessment threshold	40 % of limit value (2 µg/m³)

6. Carbon monoxide

	Eight-hour average
Upper assessment threshold	70 % of limit value (7 mg/m³)
Lower assessment threshold	50 % of limit value (5 mg/m³)

[96] The upper assessment threshold and the lower assessment threshold for $PM_{2,5}$ do not apply to the measurements to assess compliance with the $PM_{2,5}$ exposure reduction target for the protection of human health.

↓ 2008/50/EC

ANNEX III

Assessment of ambient air quality and location of sampling points for the measurement of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM_{10} and $PM_{2,5}$), lead, benzene and carbon monoxide in ambient air

A. GENERAL

Ambient air quality shall be assessed in all zones and agglomerations in accordance with the following criteria:

1. Ambient air quality shall be assessed at all locations except those listed in paragraph 2, in accordance with the criteria established by Sections B and C for the location of sampling points for fixed measurement. The principles established by Sections B and C shall also apply in so far as they are relevant in identifying the specific locations in which concentration of the relevant pollutants are established where ambient air quality is assessed by indicative measurement or modelling.

2. Compliance with the limit values directed at the protection of human health shall not be assessed at the following locations:

(a) any locations situated within areas where members of the public do not have access and there is no fixed habitation;

(b) in accordance with Article 2(1), on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply;

(c) on the carriageway of roads; and on the central reservations of roads except where there is normally pedestrian access to the central reservation.

B. MACROSCALE SITING OF SAMPLING POINTS

1. Protection of human health

(a) Sampling points directed at the protection of human health shall be sited in such a way as to provide data on the following:

– the areas within zones and agglomerations where the highest concentrations occur to which the population is likely to be directly or indirectly exposed for a period which is significant in relation to the averaging period of the limit value(s),

– levels in other areas within the zones and agglomerations which are representative of the exposure of the general population,

(b) Sampling points shall in general be sited in such a way as to avoid measuring very small micro-environments in their immediate vicinity, which means that a sampling point must be sited in such a way that the air sampled is representative of air quality for a street segment no less than 100 m length at traffic-orientated sites and at least 250 m × 250 m at industrial sites, where feasible;

(c) Urban background locations shall be located so that their pollution level is influenced by the integrated contribution from all sources upwind of the station. The pollution level should not be dominated by a single source unless such a situation is

typical for a larger urban area. Those sampling points shall, as a general rule, be representative for several square kilometres;

(d) Where the objective is to assess rural background levels, the sampling point shall not be influenced by agglomerations or industrial sites in its vicinity, i.e. sites closer than five kilometres;

(e) Where contributions from industrial sources are to be assessed, at least one sampling point shall be installed downwind of the source in the nearest residential area. Where the background concentration is not known, an additional sampling point shall be situated within the main wind direction;

(f) Sampling points shall, where possible, also be representative of similar locations not in their immediate vicinity;

(g) Account shall be taken of the need to locate sampling points on islands where that is necessary for the protection of human health.

2. Protection of vegetation and natural ecosystems

Sampling points targeted at the protection of vegetation and natural ecosystems shall be sited more than 20 km away from agglomerations or more than 5 km away from other built-up areas, industrial installations or motorways or major roads with traffic counts of more than 50000 vehicles per day, which means that a sampling point must be sited in such a way that the air sampled is representative of air quality in a surrounding area of at least 1000 km^2. A Member State may provide for a sampling point to be sited at a lesser distance or to be representative of air quality in a less extended area, taking account of geographical conditions or of the opportunities to protect particularly vulnerable areas.

Account shall be taken of the need to assess air quality on islands.

C. MICROSCALE SITING OF SAMPLING POINTS

In so far as is practicable, the following shall apply:

↓ 2015/1480 Art. 2 and Annex II.2(a)

– the flow around the inlet sampling probe shall be unrestricted (in general free in an arc of at least 270° or 180° for sampling points at the building line) without any obstructions affecting the airflow in the vicinity of the inlet (normally some metres away from buildings, balconies, trees and other obstacles and at least 0,5 m from the nearest building in the case of sampling points representing air quality at the building line),

– in general, the inlet sampling point shall be between 1,5 m (the breathing zone) and 4 m above the ground. Higher siting may also be appropriate if the station is representative of a large area and any derogations should be fully documented,

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↓ 2008/50/EC

– the inlet probe shall not be positioned in the immediate vicinity of sources in order to avoid the direct intake of emissions unmixed with ambient air,

– the sampler's exhaust outlet shall be positioned so that recirculation of exhaust air to the sampler inlet is avoided,

↓ 2015/1480 Art. 2 and Annex II.2(a)

– for all pollutants, traffic-orientated sampling probes shall be at least 25 m from the edge of major junctions and no more than 10 m from the kerbside. A 'major junction' to be considered here is a junction which interrupts the traffic flow and causes different emissions (stop&go) from the rest of the road.,

↓ 2008/50/EC

The following factors may also be taken into account:

– interfering sources,

– security,

– access,

– availability of electrical power and telephone communications,

– visibility of the site in relation to its surroundings,

– safety of the public and operators,

– the desirability of co-locating sampling points for different pollutants,

– planning requirements.,

↓ 2015/1480 Art. 2 and Annex II.2(a)

Any deviation from the criteria listed in this Section shall be fully documented through the procedures described in Section D.

↓ 2015/1480 Art. 2 and Annex II.2(b)

D. DOCUMENTATION AND REVIEW OF SITE SELECTION

The competent authorities responsible for air quality assessment shall for all zones and agglomerations fully document the site-selection procedures and record information to support the network design and choice of location for all monitoring sites. The documentation shall include compass-point photographs of the area surrounding monitoring sites and detailed maps. Where supplementary methods are used within a zone or agglomeration, the documentation shall include details of these methods and information on how the criteria listed in Article 7(3) are met. The documentation shall be updated as necessary and reviewed at least every 5 years, to ensure that selection criteria, network design and monitoring site locations remain valid and optimal over time. The documentation shall be provided to the Commission within 3 months of being requested.

↓ 2008/50

ANNEX IV

MEASUREMENTS AT RURAL BACKGROUND LOCATIONS IRRESPECTIVE OF CONCENTRATION

A. Objectives

The main objectives of such measurements are to ensure that adequate information is made available on levels in the background. This information is essential to judge the enhanced levels in more polluted areas (such as urban background, industry related locations, traffic related locations), assess the possible contribution from long-range transport of air pollutants, support source apportionment analysis and for the understanding of specific pollutants such as particulate matter. It is also essential for the increased use of modelling also in urban areas.

B. Substances

Measurement of $PM_{2.5}$ must include at least the total mass concentration and concentrations of appropriate compounds to characterise its chemical composition. At least the list of chemical species given below shall be included.

SO_4^{2-}	Na^+	NH_4^+	Ca^{2+}	elemental carbon (EC)
NO_3^-	K^+	Cl^-	Mg^{2+}	organic carbon (OC)

C. Siting

Measurements should be taken in urban background and rural background areas in accordance with parts A, B and C of Annex III.

↓ 2008/50

ANNEX V

Criteria for determining minimum numbers of sampling points for fixed measurement of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM_{10}, $PM_{2,5}$), lead, benzene and carbon monoxide in ambient air

A. Minimum number of sampling points for fixed measurement to assess compliance with limit values for the protection of human health and alert thresholds in zones and agglomerations where fixed measurement is the sole source of information

1. Diffuse sources

Population of agglomeration or zone (thousands)	If maximum concentrations exceed the upper assessment threshold[97]		If maximum concentrations are between the upper and lower assessment thresholds	
	Pollutants except PM	PM[98] (sum of PM_{10} and $PM_{2,5}$)	Pollutants except PM	PM[99] (sum of PM_{10} and $PM_{2,5}$)
0-249	1	2	1	1
250-499	2	3	1	2
500-749	2	3	1	2
750-999	3	4	1	2
1000-1499	4	6	2	3
1500-1999	5	7	2	3
2000-2749	6	8	3	4
2750-3749	7	10	3	4

97 For nitrogen dioxide, particulate matter, benzene and carbon monoxide: to include at least one urban background monitoring station and one traffic orientated station provided this does not increase the number of sampling points. For these pollutants, the total number of urban background stations and the total number of traffic oriented stations in a Member State required under Section A(1) shall not differ by more than a factor of 2. Sampling points with exceedances of the limit value for PM_{10} within the last three years shall be maintained, unless a relocation is necessary owing to special circumstances, in particular spatial development.

98 Where $PM_{2,5}$ and PM_{10} are measured in accordance with Article 8 at the same monitoring station, these shall count as two separate sampling points. The total number of $PM_{2,5}$ and PM_{10} sampling points in a Member State required under Section A(1) shall not differ by more than a factor of 2, and the number of $PM_{2,5}$ sampling points in the urban background of agglomerations and urban areas shall meet the requirements under Section B of Annex V.

99 Where $PM_{2,5}$ and PM_{10} are measured in accordance with Article 8 at the same monitoring station, these shall count as two separate sampling points. The total number of $PM_{2,5}$ and PM_{10} sampling points in a Member State required under Section A(1) shall not differ by more than a factor of 2, and the number of $PM_{2,5}$ sampling points in the urban background of agglomerations and urban areas shall meet the requirements under Section B of Annex V.

3750-4749	8	11	3	6
4750-5999	9	13	4	6
≥ 6000	10	15	4	7

2. Point sources

For the assessment of pollution in the vicinity of point sources, the number of sampling points for fixed measurement shall be calculated taking into account emission densities, the likely distribution patterns of ambient-air pollution and the potential exposure of the population.

B. Minimum number of sampling points for fixed measurement to assess compliance with the $PM_{2,5}$ exposure reduction target for the protection of human health

One sampling point per million inhabitants summed over agglomerations and additional urban areas in excess of 100000 inhabitants shall be operated for this purpose. Those sampling points may coincide with sampling points under Section A.

C. Minimum number of sampling points for fixed measurements to assess compliance with critical levels for the protection of vegetation in zones other than agglomerations

If maximum concentrations exceed the upper assessment threshold	If maximum concentrations are between upper and lower assessment threshold
1 station every 20000 km^2	1 station every 40000 km^2

In island zones the number of sampling points for fixed measurement should be calculated taking into account the likely distribution patterns of ambient-air pollution and the potential exposure of vegetation.

↓ 2008/50/EC

ANNEX VI

Reference methods for assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM_{10} and $PM_{2,5}$), lead, benzene, carbon monoxide, and ozone

↓ 2015/1480 Art. 2 and Annex II.3(a)

A. REFERENCE METHODS FOR THE ASSESSMENT OF CONCENTRATIONS OF SULPHUR DIOXIDE, NITROGEN DIOXIDE AND OXIDES OF NITROGEN, PARTICULATE MATTER (PM_{10} AND $PM_{2,5}$), LEAD, BENZENE, CARBON MONOXIDE AND OZONE

1. Reference method for the measurement of sulphur dioxide

The reference method for the measurement of sulphur dioxide is that described in EN 14212:2012 'Ambient air — Standard method for the measurement of the concentration of sulphur dioxide by ultraviolet fluorescence'.

2. Reference method for the measurement of nitrogen dioxide and oxides of nitrogen

The reference method for the measurement of nitrogen dioxide and oxides of nitrogen is that described in EN 14211:2012 'Ambient air — Standard method for the measurement of the concentration of nitrogen dioxide and nitrogen monoxide by chemiluminescence'.

↓ 2015/1480 Art. 2 and Annex II.3(a) amended by Corrigendum, OJ L 072, 14.3.2019, p. 141

3. Reference method for the sampling and measurement of lead

The reference method for the sampling of lead is that described in Section A(4) of this Annex. The reference method for the measurement of lead is that described in EN 14902:2005 'Standard method for measurement of Pb/Cd/As/Ni in the PM_{10} fraction of suspended particulate matter'.

↓ 2015/1480 Art. 2 and Annex II.3(a)

4. Reference method for the sampling and measurement of PM_{10}

The reference method for the sampling and measurement of PM_{10} is that described in EN12341:2014 'Ambient Air — standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2,5}$ mass concentration of suspended particulate matter'.

5. Reference method for the sampling and measurement of $PM_{2,5}$

The reference method for the sampling and measurement of $PM_{2,5}$ is that described in EN12341:2014 'Ambient Air — standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2,5}$ mass concentration of suspended particulate matter'

↓ 2015/1480 Art. 2 and Annex II.3(a) amended by Corrigendum, OJ L 072, 14.3.2019, p. 141

6. Reference method for the sampling and measurement of benzene

The reference method for the measurement of benzene is that described in EN 14662:2005, parts 1, 2 and 3 'Ambient air quality — Standard method for measurement of benzene concentrations'.

↓ 2015/1480 Art. 2 and Annex II.3(a)

7. Reference method for the measurement of carbon monoxide

The reference method for the measurement of carbon monoxide is that described in EN 14626:2012 'Ambient air — Standard method for the measurement of the concentration of carbon monoxide by non-dispersive infrared spectroscopy'.

8. Reference method for measurement of ozone

The reference method for the measurement of ozone is that described in EN 14625:2012 'Ambient air — Standard method for the measurement of the concentration of ozone by ultraviolet photometry'.

↓ 2008/50/EC

B. DEMONSTRATION OF EQUIVALENCE

1. A Member State may use any other method which it can demonstrate gives results equivalent to any of the methods referred to in Section A or, in the case of particulate matter, any other method which the Member State concerned can demonstrate displays a consistent relationship to the reference method. In that event the results achieved by that method must be corrected to produce results equivalent to those that would have been achieved by using the reference method.

2. The Commission may require the Member States to prepare and submit a report on the demonstration of equivalence in accordance with paragraph 1.

3. When assessing the acceptability of the report mentioned in paragraph 2, the Commission will make reference to its guidance on the demonstration of equivalence (to be published). Where Member States have been using interim factors to approximate equivalence, the latter shall be confirmed and/or amended with reference to the Commission's guidance.

4. Member States should ensure that whenever appropriate, the correction is also applied retroactively to past measurement data in order to achieve better data comparability.

C. STANDARDISATION

For gaseous pollutants the volume must be standardised at a temperature of 293 K and an atmospheric pressure of 101,3 kPa. For particulate matter and substances to be analysed in

~~particulate matter (e.g. lead) the sampling volume refers to ambient conditions in terms of temperature and atmospheric pressure at the date of measurements.~~

~~E. MUTUAL RECOGNITION OF DATA~~

↓ 2015/1480 Art. 2 and Annex II.3(c)

~~When demonstrating that equipment meets the performance requirements of the reference methods listed in Section A of this Annex, the competent authorities and bodies designated pursuant to Article 3 shall accept test reports issued in other Member States provided that the test laboratories are accredited to the relevant harmonised standard for testing and calibration laboratories.~~

~~The detailed test reports and all the results of the tests shall be available to other competent authorities or their designated bodies. Test reports shall demonstrate that the equipment meets all the performance requirements including where some environmental and site conditions are specific to a Member State and are outside the conditions for which the equipment has been already tested and type approved in another Member State.~~

↓ 2008/50/EC

ANNEX VII

OZONE TARGET VALUES AND LONG-TERM OBJECTIVES

A. DEFINITIONS AND CRITERIA

1. Definitions

AOT40 (expressed in (µg/m³) · hours) means the sum of the difference between hourly concentrations greater than 80 µg/m³ (= 40 parts per billion) and 80 µg/m³ over a given period using only the one-hour values measured between 8.00 and 20.00 Central European Time (CET) each day.

2. Criteria

The following criteria shall be used for checking validity when aggregating data and calculating statistical parameters:

Parameter	Required proportion of valid data
One hour values	75 % (i.e. 45 minutes)
Eight hours values	75 % of values (i.e. six hours)
Maximum daily 8 hours mean from hourly running 8 hours	75 % of the hourly running eight hours averages (i.e. 18 eight-hourly averages per day)
AOT40	90 % of the one hour values over the time period defined for calculating the AOT40 value[100]
Annual mean	75 % of the one hour values over summer (April to September) and 75 % over winter (January to March, October to December) seasons separately
Number of exceedances and maximum values per month	90 % of the daily maximum eight hours mean values (27 available daily values per month) 90 % of the one hour values between 8.00 and 20.00 CET
Number of exceedances and maximum values per year	five out of six months over the summer season (April to September)

[100] In cases where all possible measured data are not available, the following factor shall be used to calculate AOT40 values:

$AOT40_{estimate} = AOT40_{measured} \times$	total possible number of hours (*)
	number of measured hourly values

(*) being the number of hours within the time period of AOT40 definition, (i.e. 08:00 to 20:00 CET from 1 May to 31 July each year, for vegetation protection and from 1 April to 30 September each year for forest protection).

B. TARGET VALUES

Objective	Averaging period	Target value	Date by which target value should be met[101]
Protection of human health	Maximum daily eight-hour mean[102]	120 µg/m³ not to be exceeded on more than 25 days per calendar year averaged over three years[103]	1.1.2010
Protection of vegetation	May to July	AOT40 (calculated from 1 h values) 18000 µg/m³ · h averaged over five years[104]	1.1.2010

C. LONG-TERM OBJECTIVES

Objective	Averaging period	Longterm objective	Date by which the longterm objective should be met
Protection of human health	Maximum daily eight-hour mean within a calendar year	120 µg/m³	not defined

101 Compliance with target values will be assessed as of this date. That is, 2010 will be the first year the data for which is used in calculating compliance over the following three or five years, as appropriate.

102 The maximum daily eight hour mean concentration shall be selected by examining eight hour running averages, calculated from hourly data and updated each hour. Each eight - hour average so calculated shall be assigned to the day on which it ends. i.e. the first calculation period for any one day will be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day will be the period from 16:00 to 24:00 on the day.

103 If the three or five year averages cannot be determined on the basis of a full and consecutive set of annual data, the minimum annual data required for checking compliance with the target values will be as follows:

– for the target value for the protection of human health: valid data for one year,

– for the target value for the protection of vegetation: valid data for three years.

–

104 If the three or five year averages cannot be determined on the basis of a full and consecutive set of annual data, the minimum annual data required for checking compliance with the target values will be as follows:

– for the target value for the protection of human health: valid data for one year,

– for the target value for the protection of vegetation: valid data for three years.

–

~~Protection of vegetation~~	~~May to July~~	~~AOT40 (calculated from 1 h values) 6000 µg/m^3 · h~~	~~not defined~~

↓ 2008/50

ANNEX VIII

Criteria for classifying and locating sampling points for assessments of ozone concentrations

The following apply to fixed measurements:

A. MACROSCALE SITING

Type of station	Objectives of measurement	Representativeness[105]	Macroscale siting criteria
Urban	Protection of human health: to assess the exposure of the urban population to ozone, i.e. where population density and ozone concentration are relatively high and representative of the exposure of the general population	A few km^2	Away from the influence of local emissions such as traffic, petrol stations, etc.; vented locations where well mixed levels can be measured; locations such as residential and commercial areas of cities, parks (away from the trees), big streets or squares with very little or no traffic, open areas characteristic of educational, sports or recreation facilities
Suburban	Protection of human health and vegetation: to assess the exposure of the population and vegetation located in the outskirts of the agglomeration, where the highest ozone levels, to which the population and vegetation are likely to be	Some tens of km^2	At a certain distance from the area of maximum emissions, downwind following the main wind direction/directions during conditions favourable to ozone formation; where population, sensitive crops or natural ecosystems located in the outer fringe of an agglomeration are exposed to high ozone

105 Sampling points should, where possible, be representative of similar locations not in their immediate vicinity.

	directly or indirectly exposed occur		levels; where appropriate, some suburban stations also upwind of the area of maximum emissions, in order to determine the regional background levels of ozone
Rural	Protection of human health and vegetation: to assess the exposure of population, crops and natural ecosystems to sub-regional scale ozone concentrations	Sub-regional levels (some hundreds of km^2)	Stations can be located in small settlements and/or areas with natural ecosystems, forests or crops; representative for ozone away from the influence of immediate local emissions such as industrial installations and roads; at open area sites, but not on summits of higher mountains
Rural background	Protection of vegetation and human health: to assess the exposure of crops and natural ecosystems to regional scale ozone concentrations as well as exposure of the population	Regional/national/continental levels (1000 to 10000 km^2)	Station located in areas with lower population density, e.g. with natural ecosystems, forests, at a distance of at least 20 km from urban and industrial areas and away from local emissions; avoid locations which are subject to locally enhanced formation of ground-near inversion conditions, also summits of higher mountains; coastal sites with pronounced diurnal wind cycles of local character are not recommended.

For rural and rural background stations the location shall, where appropriate, be coordinated with the monitoring requirements of Commission Regulation (EC) No 1737/2006 of 7 November 2006 laying down detailed rules for the implementation of Regulation (EC)

~~No 2152/2003 of the European Parliament and of the Council concerning monitoring of forests and environmental interactions in the Community~~[106]~~.~~

~~**B. MICROSCALE SITING**~~

~~In so far as is practicable the procedure on microscale siting in Section C of Annex III shall be followed, ensuring also that the inlet probe is positioned well away from such sources as furnaces and incineration flues and more than 10 m from the nearest road, with distance increasing as a function of traffic intensity.~~

~~**C. DOCUMENTATION AND REVIEW OF SITE SELECTION**~~

~~The procedures in Section D of Annex III shall be followed, applying proper screening and interpretation of the monitoring data in the context of the meteorological and photochemical processes affecting the ozone concentrations measured at the respective sites.~~

~~106 OJ L 334, 30.11.2006, p. 1.~~

↓ 2008/50/EC

ANNEX IX

Criteria for determining the minimum number of sampling points for fixed measurement of concentrations of ozone

↓ 2015/1480 Art. 2 and Annex II.4

A. MINIMUM NUMBER OF SAMPLING POINTS FOR FIXED MEASUREMENTS OF CONCENTRATIONS OF OZONE

Minimum number of sampling points for fixed continuous measurements to assess compliance with target values, long — term objectives and information and alert thresholds where such measurements are the sole source of information.

Population (× 1000)	Agglomeration[107]	Other zones[108]	Rural background
< 250		1	1 station/50000 km² as an average density over all zones per country[109]
< 500	1	2	
< 1000	2	2	
< 1500	3	3	
< 2000	3	4	
< 2750	4	5	
< 3750	5	6	
≥ 3750	One additional station per 2 million inhabitants	One additional station per 2 million inhabitants	

[107] At least 1 station in areas where exposure of the population to the highest concentrations of ozone is likely to occur. In agglomerations, at least 50 % of the stations shall be located in suburban areas.

[108] At least 1 station in areas where exposure of the population to the highest concentrations of ozone is likely to occur. In agglomerations, at least 50 % of the stations shall be located in suburban areas.

[109] 1 station per 25000 km² for complex terrain is recommended.

↓ 2008/50/EC

B. MINIMUM NUMBER OF SAMPLING POINTS FOR FIXED MEASUREMENTS FOR ZONES AND AGGLOMERATIONS ATTAINING THE LONG-TERM OBJECTIVES

The number of sampling points for ozone shall, in combination with other means of supplementary assessment such as air quality modelling and collocated nitrogen dioxide measurements, be sufficient to examine the trend of ozone pollution and check compliance with the long-term objectives. The number of stations located in agglomerations and other zones may be reduced to one-third of the number specified in Section A. Where information from fixed measurement stations is the sole source of information, at least one monitoring station shall be kept. If, in zones where there is supplementary assessment, the result of this is that a zone has no remaining station, coordination with the number of stations in neighbouring zones shall ensure adequate assessment of ozone concentrations against long-term objectives. The number of rural background stations shall be one per 100000 km^2.

↓ 2008/50

ANNEX X

MEASUREMENTS OF OZONE PRECURSOR SUBSTANCES

A. OBJECTIVES

The main objectives of such measurements are to analyse any trend in ozone precursors, to check the efficiency of emission reduction strategies, to check the consistency of emission inventories and to help attribute emission sources to observed pollution concentrations.

An additional aim is to support the understanding of ozone formation and precursor dispersion processes, as well as the application of photochemical models.

B. SUBSTANCES

Measurement of ozone precursor substances shall include at least nitrogen oxides (NO and NO_2), and appropriate volatile organic compounds (VOC). A list of volatile organic compounds recommended for measurement is given below:

Ethane	1-Butene	Isoprene	Ethyl benzene
Ethylene	Trans-2-Butene	n-Hexane	m + p-Xylene
Acetylene	cis-2-Butene	i-Hexane	o-Xylene
Propane	1,3-Butadiene	n-Heptane	1,2,4-Trimethylebenzene
Propene	n-Pentane	n-Octane	1,2,3-Trimethylebenzene
n-Butane	i-Pentane	i-Octane	1,3,5-Trimethylebenzene
i-Butane	1-Pentene	Benzene	Formaldehyde
	2-Pentene	Toluene	Total non-methane hydrocarbons

C. SITING

Measurements shall be taken in particular in urban or suburban areas at any monitoring site set up in accordance with the requirements of this Directive and considered appropriate with regard to the monitoring objectives referred to in Section A.

↓ 2008/50

ANNEX XI

LIMIT VALUES FOR THE PROTECTION OF HUMAN HEALTH

A. CRITERIA

Without prejudice to Annex I, the following criteria shall be used for checking validity when aggregating data and calculating statistical parameters:

Parameter	Required proportion of valid data
One hour values	75 % (i.e. 45 minutes)
Eight hours values	75 % of values (i.e. 6 hours)
Maximum daily 8-hour mean	75 % of the hourly running eight hour averages (i.e. 18 eight hour averages per day)
24-hour values	75 % of the hourly averages (i.e. at least 18 hour values)
Annual mean	90 %[110] of the one hour values or (if not available) 24-hour values over the year

B. LIMIT VALUES

Averaging Period	Limit value	Margin of tolerance	Date by which limit value is to be met
Sulphur dioxide			
One hour	350 µg/m^3, not to be exceeded more than 24 times a calendar year	150 µg/m^3 (43 %)	—[111]
One day	125 µg/m^3, not to be exceeded more than 3 times a calendar year	None	—[112]
Nitrogen			

110 The requirements for the calculation of annual mean do not include losses of data due to the regular calibration or the normal maintenance of the instrumentation.

111 Already in force since 1 January 2005

112 Already in force since 1 January 2005

dioxide			
One hour	200 µg/m³, not to be exceeded more than 18 times a calendar year	50 % on 19 July 1999, decreasing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2010	1 January 2010
Calendar year	40 µg/m³	50 % on 19 July 1999, decreasing on 1 January 2001 and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2010	1 January 2010
Benzene			
Calendar year	5 µg/m³	5 µg/m³ (100 %) on 13 December 2000, decreasing on 1 January 2006 and every 12 months thereafter by 1 µg/m³ to reach 0 % by 1 January 2010	1 January 2010
Carbon monoxide			
maximum daily eight hour mean[113]	10 mg/m³	60 %	—[114]
Lead			
Calendar year	0,5 µg/m³[115]	100 %	—[116]
PM_{10}			
One day	50 µg/m³, not to be exceeded more than 35 times a calendar	50 %	—[117]

[113] The maximum daily eight hour mean concentration will be selected by examining eight hour running averages, calculated from hourly data and updated each hour. Each eight hour average so calculated will be assigned to the day on which it ends i.e. the first calculation period for any one day will be the period from 17:00 on the previous day to 01:00 on that day; the last calculation period for any one day will be the period from 16:00 to 24:00 on that day.

[114] Already in force since 1 January 2005

[115] Already in force since 1 January 2005. Limit value to be met only by 1 January 2010 in the immediate vicinity of the specific industrial sources situated on sites contaminated by decades of industrial activities. In such cases, the limit value until 1 January 2010 will be 1,0 µg/m³. The area in which higher limit values apply must not extend further than 1000 m from such specific sources.

[116] Already in force since 1 January 2005. Limit value to be met only by 1 January 2010 in the immediate vicinity of the specific industrial sources situated on sites contaminated by decades of industrial activities. In such cases, the limit value until 1 January 2010 will be 1,0 µg/m³. The area in which higher limit values apply must not extend further than 1000 m from such specific sources.

[117] Already in force since 1 January 2005

	~~year~~		
~~Calendar year~~	~~40 µg/m^3~~	~~20 %~~	~~—~~[118]

[118] ~~Already in force since 1 January 2005~~

↓ 2008/50/EC

ANNEX XII

INFORMATION AND ALERT THRESHOLDS

A. ALERT THRESHOLDS FOR POLLUTANTS OTHER THAN OZONE

To be measured over three consecutive hours at locations representative of air quality over at least 100 km^2 or an entire zone or agglomeration, whichever is the smaller.

Pollutant	Alert threshold
Sulphur dioxide	500 $\mu g/m^3$
Nitrogen dioxide	400 $\mu g/m^3$

B. INFORMATION AND ALERT THRESHOLDS FOR OZONE

Purpose	Averaging period	Threshold
Information	1 hour	180 $\mu g/m^3$
Alert	1 hour[119]	240 $\mu g/m^3$

[119] For the implementation of Article 24, the exceedance of the threshold is to be measured or predicted for three consecutive hours.

↓ 2008/50

~~ANNEX XIII~~

~~CRITICAL LEVELS FOR THE PROTECTION OF VEGETATION~~

~~Averaging period~~	~~Critical level~~	~~Margin of tolerance~~
~~Sulphur dioxide~~		
~~Calendar year and winter (1 October to 31 March)~~	~~20 µg/m^3~~	~~None~~
~~Oxides of nitrogen~~		
~~Calendar year~~	~~30 µg/m^3 NO_x~~	~~None~~

↓ 2008/50/EC

ANNEX XIV

NATIONAL EXPOSURE REDUCTION TARGET, TARGET VALUE AND LIMIT VALUE FOR $PM_{2,5}$

A. AVERAGE EXPOSURE INDICATOR

The Average Exposure Indicator expressed in µg/m³ (AEI) shall be based upon measurements in urban background locations in zones and agglomerations throughout the territory of a Member State. It should be assessed as a three-calendar year running annual mean concentration averaged over all sampling points established pursuant to Section B of Annex V. The AEI for the reference year 2010 shall be the mean concentration of the years 2008, 2009 and 2010.

However, where data are not available for 2008, Member States may use the mean concentration of the years 2009 and 2010 or the mean concentration of the years 2009, 2010 and 2011. Member States making use of these possibilities shall communicate their decisions to the Commission by 11 September 2008.

The AEI for the year 2020 shall be the three-year running mean concentration averaged over all those sampling points for the years 2018, 2019 and 2020. The AEI is used for the examination whether the national exposure reduction target is met.

The AEI for the year 2015 shall be the three-year running mean concentration averaged over all those sampling points for the years 2013, 2014 and 2015. The AEI is used for the examination whether the exposure concentration obligation is met.

B. NATIONAL EXPOSURE REDUCTION TARGET

Exposure reduction target relative to the AEI in 2010		Year by which the exposure reduction target should be met
Initial concentration in µg/m³	Reduction target in percent	2020
< 8,5 = 8,5	0 %	
≥ 8,5 — < 13	10 %	
= 13 — < 18	15 %	
= 18 — < 22	20 %	
≥ 22	All appropriate measures to achieve 18 µg/m³	

Where the AEI in the reference year is 8,5 µg/m³ or less the exposure reduction target shall be zero. The reduction target shall be zero also in cases where the AEI reaches the level of

~~8,5 µg/m³ at any point of time during the period from 2010 to 2020 and is maintained at or below that level.~~

~~C. EXPOSURE CONCENTRATION OBLIGATION~~

~~Exposure concentration obligation~~	~~Year by which the obligation value is to be met~~
~~20 µg/m³~~	~~2015~~

~~D. TARGET VALUE~~

~~Averaging period~~	~~Target value~~	~~Date by which target value should be met~~
~~Calendar year~~	~~25 µg/m³~~	~~1 January 2010~~

~~E. LIMIT VALUE~~

~~Averaging period~~	~~Limit value~~	~~Margin of tolerance~~	~~Date by which limit value is to be met~~
~~STAGE 1~~			
~~Calendar year~~	~~25 µg/m³~~	~~20 % on 11 June 2008, decreasing on the next 1 January and every 12 months thereafter by equal annual percentages to reach 0 % by 1 January 2015~~	~~1 January 2015~~
~~STAGE 2~~[120]			
~~Calendar year~~	~~20 µg/m³~~		~~1 January 2020~~

[120] ~~Stage 2 — indicative limit value to be reviewed by the Commission in 2013 in the light of further information on health and environmental effects, technical feasibility and experience of the target value in Member States.~~

↓ 2008/50

ANNEX XV

Information to be included in the local, regional or national air quality plans for improvement in ambient air quality

A. INFORMATION TO BE PROVIDED UNDER ARTICLE 23 (AIR QUALITY PLANS)

1. Localisation of excess pollution

(a) region;

(b) city (map);

(c) measuring station (map, geographical coordinates).

2. General information

(a) type of zone (city, industrial or rural area);

(b) estimate of the polluted area (km^2) and of the population exposed to the pollution;

(c) useful climatic data;

(d) relevant data on topography;

(e) sufficient information on the type of targets requiring protection in the zone.

3. Responsible authorities

Names and addresses of persons responsible for the development and implementation of improvement plans.

4. Nature and assessment of pollution

(a) concentrations observed over previous years (before the implementation of the improvement measures);

(b) concentrations measured since the beginning of the project;

(c) techniques used for the assessment.

5. Origin of pollution

(a) list of the main emission sources responsible for pollution (map);

(b) total quantity of emissions from these sources (tonnes/year);

(c) information on pollution imported from other regions.

6. Analysis of the situation

(a) details of those factors responsible for the exceedance (e.g. transport, including cross-border transport, formation of secondary pollutants in the atmosphere);

(b) details of possible measures for the improvement of air quality.

7. Details of those measures or projects for improvement which existed prior to 11 June 2008, i.e:

(a) local, regional, national, international measures;

(b) observed effects of these measures.

8. Details of those measures or projects adopted with a view to reducing pollution following the entry into force of this Directive:

(a) listing and description of all the measures set out in the project;

(b) timetable for implementation;

(c) estimate of the improvement of air quality planned and of the expected time required to attain these objectives.

9. Details of the measures or projects planned or being researched for the long term.

10. List of the publications, documents, work, etc., used to supplement information required under this Annex.

B. INFORMATION TO BE PROVIDED UNDER ARTICLE 22(1)

1. All information as laid down in Section A.

2. Information concerning the status of implementation of the following Directives:

1. Council Directive 70/220/EEC of 20 March 1970 on the approximation of the laws of the Member States on measures to be taken against air pollution by emissions from motor vehicles[121];

2. Directive 94/63/EC of the European Parliament and of the Council of 20 December 1994 on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations[122];

3. Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control[123];

4. Directive 97/68/EC of the European Parliament and of the Council of 16 December 1997 on the approximation of the laws of the Member States relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery[124];

5. Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels[125];

6. Council Directive 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations[126];

7. Council Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels[127];

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121 OJ L 76, 6.4.1970, p. 1. Directive as last amended by Directive 2006/96/EC (OJ L 363, 20.12.2006, p. 81).

122 OJ L 365, 31.12.1994, p. 24. Directive as amended by Regulation (EC) No 1882/2003 (OJ L 284, 31.10.2003, p. 1).

123 OJ L 24, 29.1.2008, p. 8.

124 OJ L 59, 27.2.1998, p. 1. Directive as last amended by Directive 2006/105/EC.

125 OJ L 350, 28.12.1998, p. 58. Directive as amended by Regulation (EC) No 1882/2003.

126 OJ L 85, 29.3.1999, p. 1. Directive as last amended by Directive 2004/42/EC of the European Parliament and of the Council (OJ L 143, 30.4.2004, p. 87).

127 OJ L 121, 11.5.1999, p. 13. Directive as last amended by Directive 2005/33/EC of the European Parliament and of the Council (OJ L 191, 22.7.2005, p. 59).

8. Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste[128];

9. Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants;

10. Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants;

11. Directive 2004/42/EC of the European Parliament and of the Council 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[129];

12. Directive 2005/33/EC of the European Parliament and of the Council of 6 July 2005 amending Directive 1999/32/EC as regards the sulphur content of marine fuels[130];

13. Directive 2005/55/EC of the European Parliament and of the Council of 28 September 2005 on the approximation of the laws of the Member States relating to the measures to be taken against the emission of gaseous and particulate pollutants from compression-ignition engines for use in vehicles, and the emission of gaseous pollutants from positive-ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles[131];

14. Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services[132].

3. Information on all air pollution abatement measures that have been considered at appropriate local, regional or national level for implementation in connection with the attainment of air quality objectives, including:

(a) reduction of emissions from stationary sources by ensuring that polluting small and medium sized stationary combustion sources (including for biomass) are fitted with emission control equipment or replaced;

(b) reduction of emissions from vehicles through retrofitting with emission control equipment. The use of economic incentives to accelerate take-up should be considered;

(c) procurement by public authorities, in line with the handbook on environmental public procurement, of road vehicles, fuels and combustion equipment to reduce emissions, including the purchase of:

– new vehicles, including low emission vehicles,

– cleaner vehicle transport services,

– low emission stationary combustion sources,

– low emission fuels for stationary and mobile sources,

128 OJ L 332, 28.12.2000, p. 91.
129 OJ L 143, 30.4.2004, p. 87.
130 OJ L 191, 22.7.2005, p. 59.
131 OJ L 275, 20.10.2005, p. 1. Directive as last amended by Regulation (EC) No 715/2007 (OJ L 171, 29.6.2007, p. 1).
132 OJ L 114, 27.4.2006, p. 64.

~~(d) measures to limit transport emissions through traffic planning and management (including congestion pricing, differentiated parking fees or other economic incentives; establishing low emission zones);~~

~~(e) measures to encourage a shift of transport towards less polluting modes;~~

~~(f) ensuring that low emission fuels are used in small, medium and large scale stationary sources and in mobile sources;~~

~~(g) measures to reduce air pollution through the permit system under Directive 2008/1/EC, the national plans under Directive 2001/80/EC, and through the use of economic instruments such as taxes, charges or emission trading.~~

~~(h) where appropriate, measures to protect the health of children or other sensitive groups.~~

↓ 2008/50/EC

~~ANNEX XVI~~

~~PUBLIC INFORMATION~~

~~1. Member States shall ensure that up-to-date information on ambient concentrations of the pollutants covered by this Directive is routinely made available to the public.~~

~~2. Ambient concentrations provided shall be presented as average values according to the appropriate averaging period as laid down in Annex VII and Annexes XI to XIV. The information shall at least indicate any levels exceeding air quality objectives including limit values, target values, alert thresholds, information thresholds or long-term objectives of the regulated pollutant. It shall also provide a short assessment in relation to the air quality objectives and appropriate information regarding effects on health, or, where appropriate, vegetation.~~

~~3. Information on ambient concentrations of sulphur dioxide, nitrogen dioxide, particulate matter (at least PM_{10}), ozone and carbon monoxide shall be updated on at least a daily basis, and, wherever practicable, information shall be updated on an hourly basis. Information on ambient concentrations of lead and benzene, presented as an average value for the last 12 months, shall be updated on a three-monthly basis, and on a monthly basis, wherever practicable.~~

~~4. Member States shall ensure that timely information about actual or predicted exceedances of alert thresholds, and any information threshold is provided to the public. Details supplied shall include at least the following information:~~

~~(a) information on observed exceedance(s):~~

~~– location or area of the exceedance,~~

~~– type of threshold exceeded (information or alert),~~

~~– start time and duration of the exceedance,~~

~~– highest one hour concentration and in addition highest eight hour mean concentration in the case of ozone;~~

~~(b) forecast for the following afternoon/day(s):~~

~~– geographical area of expected exceedances of information and/or alert threshold,~~

~~– expected changes in pollution (improvement, stabilisation or deterioration), together with the reasons for those changes;~~

~~(c) information on the type of population concerned, possible health effects and recommended behaviour:~~

~~– information on population groups at risk,~~

~~– description of likely symptoms,~~

~~– recommended precautions to be taken by the population concerned,~~

~~– where to find further information;~~

~~(d) information on preventive action to reduce pollution and/or exposure to it: indication of main source sectors; recommendations for action to reduce emissions;~~

~~(e) in the case of predicted exceedances, Member State shall take steps to ensure that such details are supplied to the extent practicable.~~

↓ 2008/50 (adapted)

ANNEX XVII

CORRELATION TABLE

This Directive	Directive 96/62/EC	Directive 1999/30/EC	Directive 2000/69/EC	Directive 2002/3/EC
Article 1	Article 1	Article 1	Article 1	Article 1
Article 2(1) to (5)	Article 2(1) to (5)	—	—	—
Article 2(6) and (7)	—	—	—	—
Article 2(8)	Article 2(8)	Article 2(7)	—	—
Article 2(9)	Article 2(6)	—	—	Article 2(9)
Article 2(10)	Article 2(7)	Article 2(6)	—	Article 2(11)
Article 2(11)	—	—	—	Article 2(12)
Article 2(12) and (13)	—	Article 2(13) and (14)	Article 2(a) and (b)	—
Article 2(14)	—	—	—	Article 2(10)
Article 2(15) and (16)	Article 2(9) and (10)	Article 2(8) and (9)	—	Article 2(7) and (8)
Article 2(17) and (18)	—	Article 2(11) and (12)	—	—
Article 2(19), (20), (21), (22) and (23)	—	—	—	—
Article 2(24)	—	Article 2(10)	—	—
Article 2(25) and (26)	Article 6(5)	—	—	—
Article 2(27)	—	—	—	Article 2(13)
Article 2(28)	—	—	—	Article 2(3)
Article 3, with the exception of paragraph (1)(f)	Article 3	—	—	—
Article 3(1)(f)	—	—	—	—

~~Article 4~~	~~Article 2(9) and (10), Article 6(1)~~	—	—	—
~~Article 5~~	—	~~Article 7(1)~~	~~Article 5(1)~~	—
~~Article 6(1) to (4)~~	~~Article 6(1) to (4)~~	—	—	—
~~Article 6(5)~~	—	—	—	—
~~Article 7~~	—	~~Article 7(2) and (3) with amendments~~	~~Article 5(2) and (3) with amendments~~	—
~~Article 8~~	—	~~Article 7(5)~~	~~Article 5(5)~~	—
~~Article 9~~	—	—	—	~~Article 9(1) first and second subparagraphs~~
~~Article 10~~	—	—	—	~~Article 9(1) to (3) with amendments~~
~~Article 11(1)~~	—	—	—	~~Article 9(4)~~
~~Article 11(2)~~	—	—	—	—
~~Article 12~~	~~Article 9~~	—	—	—
~~Article 13(1)~~	—	~~Articles 3(1), 4(1), 5(1) and 6~~	~~Articles 3(1) and 4~~	—
~~Article 13(2)~~	—	~~Articles 3(2) and 4(2)~~	—	—
~~Article 13(3)~~	—	~~Article 5(5)~~	—	—
~~Article 14~~	—	~~Articles 3(1) and 4(1) with amendments~~	—	—
~~Article 15~~	—	—	—	—
~~Article 16~~	—	—	—	—
~~Article 17(1)~~	—	—	—	~~Articles 3(1) and 4(1)~~
~~Article 17(2)~~	—	—	—	~~Article 3(2)~~

				~~and (3)~~
~~Article 17(3)~~	~~—~~	~~—~~	~~—~~	~~Article 4(2)~~
~~Article 18~~	~~—~~	~~—~~	~~—~~	~~Article 5~~
~~Article 19~~	~~Article 10 with amendments~~	~~Article 8(3)~~	~~—~~	~~Article 6 with amendments~~
~~Article 20~~	~~—~~	~~Articles 3(4) and 5(4) with amendments~~	~~—~~	~~—~~
~~Article 21~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Article 22~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Article 23~~	~~Article 8(1) to (4) with amendments~~	~~—~~	~~—~~	~~—~~
~~Article 24~~	~~Article 7(3) with amendments~~	~~—~~	~~—~~	~~Article 7 with amendments~~
~~Article 25~~	~~Article 8(5) with amendments~~	~~—~~	~~—~~	~~Article 8 with amendments~~
~~Article 26~~	~~—~~	~~Article 8 with amendments~~	~~Article 7 with amendments~~	~~Article 6 with amendments~~
~~Article 27~~	~~Article 11 with amendments~~	~~Article 5(2) second subparagraph~~	~~—~~	~~Article 10 with amendments~~
~~Article 28(1)~~	~~Article 12(1) with amendments~~	~~—~~	~~—~~	~~—~~
~~Article 28(2)~~	~~Article 11 with amendments~~	~~—~~	~~—~~	~~—~~
~~Article 28(3)~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Article 28(4)~~	~~—~~	~~Annex IX with amendments~~	~~—~~	~~—~~
~~Article 29~~	~~Article 12(2)~~	~~—~~	~~—~~	~~—~~
~~Article 30~~	~~—~~	~~Article 11~~	~~Article 9~~	~~Article 14~~

~~Article 31~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Article 32~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Article 33~~	~~Article 13~~	~~Article 12~~	~~Article 10~~	~~Article 15~~
~~Article 34~~	~~Article 14~~	~~Article 13~~	~~Article 11~~	~~Article 17~~
~~Article 35~~	~~Article 15~~	~~Article 14~~	~~Article 12~~	~~Article 18~~
~~Annex I~~	~~—~~	~~Annex VIII with amendments~~	~~Annex VI~~	~~Annex VII~~
~~Annex II~~	~~—~~	~~Annex V with amendments~~	~~Annex III~~	~~—~~
~~Annex III~~	~~—~~	~~Annex VI~~	~~Annex IV~~	~~—~~
~~Annex IV~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Annex V~~	~~—~~	~~Annex VII with amendments~~	~~Annex V~~	~~—~~
~~Annex VI~~	~~—~~	~~Annex IX with amendments~~	~~Annex VII~~	~~Annex VIII~~
~~Annex VII~~	~~—~~	~~—~~	~~—~~	~~Annex I, Annex III section II~~
~~Annex VIII~~	~~—~~	~~—~~	~~—~~	~~Annex IV~~
~~Annex IX~~	~~—~~	~~—~~	~~—~~	~~Annex V~~
~~Annex X~~	~~—~~	~~—~~	~~—~~	~~Annex VI~~
~~Annex XI~~	~~—~~	~~Annex I, section I, Annex II, section I and Annex III (with amendments); Annex IV (unchanged)~~	~~Annex I, Annex II~~	~~—~~
~~Annex XII~~	~~—~~	~~Annex I, section II, Annex II, section II,~~	~~—~~	~~Annex II, section I~~
~~Annex XIII~~	~~—~~	~~Annex I, section I,~~	~~—~~	~~—~~

		~~Annex II, section I~~		
~~Annex XIV~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Annex XV Section A~~	~~Annex IV~~	~~—~~	~~—~~	~~—~~
~~Annex XV Section B~~	~~—~~	~~—~~	~~—~~	~~—~~
~~Annex XVI~~	~~—~~	~~Article 8~~	~~Article 7~~	~~Article 6 with amendments~~

Information Note

1. Proposal

Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on ambient air quality and cleaner air for Europe (recast)

2. Date of Commission document
26/10/2022

3. Number of Commission document
*COM (*2022) 542

4. Number of Council document:
2022/0347

5. Dealt with in Strasbourg, France by
Working Party on the Environment

6. Department with primary responsibility
Department of the Environment, Climate and Communications.

7. Other Departments involved
None

8. Background to, short summary and aim of the proposal
Clean air is essential to human health and sustaining the environment. Major improvements in air quality have been achieved in the European Union (EU) over the past three decades, thanks to joint efforts by the EU and national, regional and local authorities in the Member States to reduce the adverse impacts of air pollution. However, around 300 000 premature deaths a year (compared with up to 1 million a year in the early 1990s) and a significant number of noncommunicable diseases such as asthma, cardiovascular problems and lung cancer, are still attributed to air pollution (and especially to particulate matter, nitrogen dioxide and ozone). Air pollution continues to be the number one environmental cause of early death in the EU. It disproportionally affects vulnerable groups such as children, elderly people and persons with pre-existing conditions, as well as socioeconomically disadvantaged groups. There is also increasing evidence that air pollution may be associated with changes of the nervous system, such as dementia.

In December 2019, in the European Green Deal, the European Commission committed to further improving air quality and to aligning EU air quality standards more closely with the recommendations of the World Health Organization (WHO). The WHO recommendations were most recently revised in September 2021 and are subject to periodic scientific review, typically every 10 years.

This objective of closer alignment with latest scientific findings was confirmed in the zero-pollution action plan, entailing a vision for 2050 to reduce air (and water and soil) pollution to levels no longer considered harmful to health and natural ecosystems, and that respect the boundaries our planet can cope with, thus creating a toxic-free environment.

In addition, 2030 targets were introduced, two of them on air: to reduce the health impacts of air pollution (premature deaths) by more than 55%, and the share of EU ecosystems where air pollution threatens biodiversity by 25%. Stricter air quality standards would also contribute to the objectives of Europe's Beating Cancer Plan. The Commission also announced in the European Green Deal that it would strengthen air quality monitoring, modelling and planning.

The amount of pollution from such sources is also affected by other policies that influence key activities and sectors in areas such as transport, industry, energy and climate, and agriculture. A number of these policies are part of recent initiatives taken under the European Green Deal, such as the zero pollution action plan, the European Climate Law and the Fit for 55 package with initiatives on energy efficiency and renewable energy, the methane strategy, the sustainable and smart mobility strategy, the related 2021 new urban mobility framework, the biodiversity strategy and the farm to fork initiative . Furthermore, significant reductions of pollutant emissions from cars, vans, lorries and buses are expected to result from the adoption and implementation of the forthcoming Euro 7 proposal (cf PLAN/2020/6308).

The revision of the Ambient Air Quality Directives (Directives 2004/107/EC and 2008/50/EC) would merge the Directives into one, and seek to:

- *align EU air quality standards more closely with WHO recommendations*
- *further improve the legislative framework (e.g., in relation to penalties, and public information)*
- *better support local authorities in achieving cleaner air through strengthening air quality monitoring, modelling and plans.*

Full details of the proposal are available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A542%3AFIN

9. Legal basis of the proposal

Article 191 and 192 of the Treaty on the Functioning of the European Union

10. Voting Method

QMV

11. Role of the EP

Co decision

12. Category of proposal

The proposal relates to the recast of an existing Directive, merging two separate Directives and reflecting increased ambition

13. Implications for Ireland & Ireland's Initial View'

Ireland supports the proposed approach on the basis that it contains necessary measures to help the EU achieve its air quality goals. However, further information and examination is required in relation to the proposed new limit values in the context of Irish air quality levels and the policy measures required to achieve the new targets.

14. Impact on the public

It is estimated that approximately 1,400 premature deaths occur in Ireland due to air pollution, the health benefits of reducing air pollution even further will be significant in terms improved quality of life.

15. Have any consultations with Stakeholders taken place or are there any plans to do so?

At EU level, the Commission carried out a broad consultation with stakeholders. The stakeholder consultation aimed to collect supporting information, data, knowledge and views from a comprehensive range of stakeholders, to provide input for the different policy options for revising the Ambient Air Quality Directives, and to help assess the feasibility of implementing them.

The open public consultation ran for 12 weeks, as an online questionnaire with 13 introductory and 31 specific questions, hosted on the EU Survey tool. The questionnaire included issues to be covered in the impact assessment and gathered initial views on the ambition level and potential impacts of certain options for revision of the Ambient Air Quality Directives. A total of 934 responses were received, and 116 position papers were submitted. Open questions received between 11 and 406 individual responses – 124 on average. The responses came from 23 different Member States.

A targeted survey was published on EU Survey in two parts (part 1 on policy area 1 'air quality standards' on 13 December 2021, and part 2 on policy areas 2 and 3 'governance; monitoring, modelling and air quality plans' on 13 January 2022), both with a deadline for contributions of 11 February 2022. The targeted survey sought in-depth views from organisations with an interest in or working with EU rules on air quality. Accordingly, the survey was sent out to targeted stakeholders, including relevant authorities at different levels of governance, private sector organisations, academics and civil society organisations in all EU Member States. Part 1 of the targeted stakeholder survey received in total 139 replies from 24 Member States. Part 2 of the survey received 93 replies from 22 Member States.

The first stakeholder meeting took place on 23 September 2021 and was attended by 315 external participants, either onsite or online, from 27 Member States. The aim of the first stakeholder meeting was to gather views on shortcomings identified in the current Ambient Air Quality Directives, as well as on the ambition level for the revised legislation.

The second stakeholder meeting on 4 April 2022 was attended by 257 external participants, either onsite or online, from 23 Member States. The aim of the meeting was to collect feedback from stakeholders for the completion of the impact assessment.

Targeted interviews were conducted to complement the other consultation activities, in particular with representatives of regional and national public authorities, civil society & NGOs, and academia & research. The main purpose of the interviews was to fill remaining information gaps identified from the evaluation of the targeted stakeholder survey. Consequently, the interviews focused on policy area 2, notably on the feasibility, means of implementation and impacts of the various options considered.

In addition, the impact assessment took into account: 30 ad hoc contributions (position papers, scientific studies and other documents) received from 25 different stakeholders; discussions at the third EU Clean Air Forum on 18 and 19 November 2021; feedback on the

inception impact assessment from 63 stakeholders from 12 Member States; and the Fit for Future Platform opinion on the ambient air quality legislation.

Furthermore, the report on the final outcome of the Conference on the Future of Europe showed that citizens demand action to reduce air pollution.

Within Ireland, officials from DECC are currently reviewing the full proposal with a view to begin targeted stakeholder engagement in early 2023.

16. Are there any subsidiarity issues for Ireland?
No

17. Anticipated negotiating period
Q3/Q4 2023

18. Proposed implementation date
Not yet available

19. Consequences for national legislation
Domestic legislation may need to be reviewed and updated accordingly.

20. Method of Transposition into Irish law
Statutory Instrument, secondary legislation

21. Anticipated Transposition date
Not yet available

22. Consequences for the EU budget in Euros annually

The financial statement related to the budgetary implications and the human and administrative resources required for this proposal are integrated in the legislative financial statement for the zero-pollution package which is presented as part of the proposal for revision of the lists of pollutants affecting surface and groundwaters.

The proposal will have budgetary implications for the Commission, the Joint Research Centre (JRC) and the European Environment Agency (EEA) in terms of human and administrative resources required.

The Commission's implementation and enforcement workload will slightly increase as a result of listing new standards and more substances to be monitored, and the need to review and update existing guidance and implementing decisions, as well as draft new guidance documents.

The Commission will furthermore need increased support from the JRC to strengthen air quality monitoring and modelling implementation. Specifically, this will involve drafting guidance, chairing two key expert networks, and drawing up standards relating to air quality monitoring and modelling in collaboration with the European Committee for Standardization (CEN). This scientific support would be obtained through the launch of administrative arrangements.

The EEA will have an increased workload as a result of: the need to expand infrastructure and support continuous reporting, which would be extended to include air pollutants of emerging concern as well as average exposure reduction obligations covering pollutants PM2.5 and NO2; the need to expand reporting infrastructure for up-to-date information from additional sampling points, modelling data and air quality plans; the need to increase support for sound assessments of air quality data reported; and the need to strengthen the links between the analysis and support for policies on air pollution, climate change, human and ecosystem health. This will require one new additional full-time-equivalent staff and two redeployments, on top of the current team of EEA colleagues already supporting EU clean air policy.

23. Contact name, telephone number and e-mail address of official in Department with primary responsibility

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Date 18/11/2022