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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 (PM₁₀/PM_{2,5}) and lead | Ozone and related NO and NO₂ |
|---------------------------------|---|-------------------|---|--|
| Fixed measurements ^a | | | | |
| 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 % ^b | — | — |
| — industrial sites | — | 90 % | — | — |
| Indicative measurements | | | | |
| Uncertainty | 25 % | 30 % | 50 % | 30 % |
| Minimum data capture | 90 % | 90 % | 90 % | 90 % |
| Minimum time coverage | 14 % ^d | 14 % ^c | 14 % ^d | > 10 % during summer |
| Modelling uncertainty: | | | | |
| Hourly | 50 % | — | — | 50 % |
| Eight-hour averages | 50 % | — | — | 50 % |
| Daily averages | 50 % | — | not yet defined | — |
| Annual averages | 30 % | 50 % | 50 % | — |

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| | | | | |
|----------------------|--|-------|-------|------|
| Objective estimation | | | | |
| Uncertainty | 75 % | 100 % | 100 % | 75 % |
| a | 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 µg/m ³) should be evaluated instead of the number of exceedances, which is highly influenced by data coverage. | | | |
| b | Distributed over the year to be representative of various conditions for climate and traffic. | | | |
| c | One day's measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year. | | | |
| d | One measurement a week at random, evenly distributed over the year, or eight weeks evenly distributed over the year. | | | |

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.

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.

[^{F1}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.]

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Textual Amendments

- F1** Substituted by [Commission Directive \(EU\) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council laying down the rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality \(Text with EEA relevance\).](#)

ANNEX II

Determination of requirements for assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM₁₀ 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/m ³ , not to be exceeded more than 3 times in any calendar year) | 60 % of winter critical level (12 µg/m ³) |
| Lower assessment threshold | 40 % of 24-hour limit value (50 µg/m ³ , not to be exceeded more than three times in any calendar year) | 40 % of winter critical level (8 µg/m ³) |

2. Nitrogen dioxide and oxides of nitrogen

| | Hourly limit value for the protection of human health (NO₂) | Annual limit value for the protection of human health (NO₂) | Annual critical level for the protection of vegetation and natural ecosystems (NO_x) |
|----------------------------|--|---|---|
| Upper assessment threshold | 70 % of limit value (140 µg/m ³ , not to be exceeded more than 18 times in any calendar year) | 80 % of limit value (32 µg/m ³) | 80 % of critical level (24 µg/m ³) |
| Lower assessment threshold | 50 % of limit value (100 µg/m ³ , not to be exceeded more than 18 times in any calendar year) | 65 % of limit value (26 µg/m ³) | 65 % of critical level (19,5 µg/m ³) |

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3. Particulate matter (PM₁₀/PM_{2,5})

| | 24-hour average PM₁₀ | Annual average PM₁₀ | Annual average PM_{2,5}^a |
|----------------------------|---|---|--|
| Upper assessment threshold | 70 % of limit value (35 µg/m ³ , not to be exceeded more than 35 times in any calendar year) | 70 % of limit value (28 µg/m ³) | 70 % of limit value (17 µg/m ³) |
| Lower assessment threshold | 50 % of limit value (25 µg/m ³ , not to be exceeded more than 35 times in any calendar year) | 50 % of limit value (20 µg/m ³) | 50 % of limit value (12 µg/m ³) |

^a 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.

4. Lead

| | Annual average |
|----------------------------|---|
| Upper assessment threshold | 70 % of limit value (0,35 µg/m ³) |
| Lower assessment threshold | 50 % of limit value (0,25 µg/m ³) |

5. Benzene

| | Annual average |
|----------------------------|--|
| Upper assessment threshold | 70 % of limit value (3,5 µg/m ³) |
| Lower assessment threshold | 40 % of limit value (2 µg/m ³) |

6. Carbon monoxide

| | Eight-hour average |
|----------------------------|--|
| Upper assessment threshold | 70 % of limit value (7 mg/m ³) |
| Lower assessment threshold | 50 % of limit value (5 mg/m ³) |

B. Determination of exceedances of upper and lower assessment thresholds

Exceedances of upper and lower assessment thresholds shall be determined on the basis of concentrations during the previous 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 three separate years out of those previous five years.

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Where fewer than 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.

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 (PM₁₀ 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 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 km². 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:

- ^[F1]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,]
- 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,
- ^[F1]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.,]

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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.,

[^{F2}Any deviation from the criteria listed in this Section shall be fully documented through the procedures described in Section D.]

Textual Amendments

- F2** Inserted by [Commission Directive \(EU\) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council laying down the rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality \(Text with EEA relevance\).](#)

[^{F1}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.]

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

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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 particular in rural background areas in accordance with parts A, B and C of Annex III.

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 (PM₁₀, 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 ^a | | If maximum concentrations are between the upper and lower assessment thresholds | |
|---|--|--|---|--|
| | Pollutants except PM | PM ^b (sum of PM ₁₀ and PM _{2,5}) | Pollutants except PM | PM ^b (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 |
| 1 000-1 499 | 4 | 6 | 2 | 3 |
| 1 500-1 999 | 5 | 7 | 2 | 3 |
| 2 000-2 749 | 6 | 8 | 3 | 4 |
| 2 750-3 749 | 7 | 10 | 3 | 4 |
| 3 750-4 749 | 8 | 11 | 3 | 6 |
| 4 750-5 999 | 9 | 13 | 4 | 6 |

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| | | | | |
|--|----|----|---|---|
| $\geq 6\ 000$ | 10 | 15 | 4 | 7 |
| <p>a 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 PM₁₀ within the last three years shall be maintained, unless a relocation is necessary owing to special circumstances, in particular spatial development.</p> | | | | |
| <p>b Where PM_{2,5} and PM₁₀ 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 PM₁₀ 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.</p> | | | | |

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 100 000 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 20 000 km ² | 1 station every 40 000 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.

ANNEX VI

Reference methods for assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM₁₀ and PM_{2,5}), lead, benzene, carbon monoxide, and ozone

[^{F1}A. Reference methods for the assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM₁₀ 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’.

[^{X1}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 PM₁₀ fraction of suspended particulate matter’.]

Editorial Information

- X1** Substituted by [Corrigendum to Commission Directive \(EU\) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council laying down the rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality \(Official Journal of the European Union L 226 of 29 August 2015\).](#)

4. Reference method for the sampling and measurement of PM₁₀

The reference method for the sampling and measurement of PM₁₀ is that described in EN12341:2014 ‘Ambient Air — standard gravimetric measurement method for the determination of the PM₁₀ 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 PM₁₀ or PM_{2,5} mass concentration of suspended particulate matter’

[^{X1}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’.]

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’.]

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

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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.

F³D. Introduction of new equipment

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Textual Amendments

- F3** Deleted by [Commission Directive \(EU\) 2015/1480 of 28 August 2015 amending several annexes to Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council laying down the rules concerning reference methods, data validation and location of sampling points for the assessment of ambient air quality \(Text with EEA relevance\).](#)

E. Mutual recognition of data

[^{F1}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.]

ANNEX VII

OZONE TARGET VALUES AND LONG-TERM OBJECTIVES

A. Definitions and criteria

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1. Definitions

AOT40 (expressed in $(\mu\text{g}/\text{m}^3) \cdot \text{hours}$) means the sum of the difference between hourly concentrations greater than $80 \mu\text{g}/\text{m}^3$ (= 40 parts per billion) and $80 \mu\text{g}/\text{m}^3$ 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 ^a |
| 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) |

a In cases where all possible measured data are not available, the following factor shall be used to calculate AOT40 values:

| | |
|--|------------------------------------|
| $\text{AOT40}_{\text{estimate}} = \text{AOT40}_{\text{measured}} \times$ | 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 ^a |
|-----------|------------------|--------------|---|
| | | | |

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| | | | |
|----------------------------|--|--|----------|
| Protection of human health | Maximum daily eight-hour mean ^b | 120 µg/m ³ not to be exceeded on more than 25 days per calendar year averaged over three years ^c | 1.1.2010 |
| Protection of vegetation | May to July | AOT40 (calculated from 1 h values) 18 000 µg/m ³ · h averaged over five years ^c | 1.1.2010 |

a 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.

b 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.

c 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.

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/m ³ | not defined |
| Protection of vegetation | May to July | AOT40 (calculated from 1 h values) 6 000 µg/m ³ · h | not defined |

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 ^a | Macroscale siting criteria |
|-----------------|-----------------------------|---------------------------------|--|
| Urban | Protection of human health: | A few km ² | Away from the influence of local emissions such as |

a Sampling points should, where possible, be representative of similar locations not in their immediate vicinity.

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| | | | |
|----------|--|---|--|
| | 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 | | 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 directly or indirectly exposed occur | 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 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- | Sub-regional levels (some hundreds of km ²) | Stations can be located in small settlements and/or areas with natural ecosystems, forests or crops; |

a Sampling points should, where possible, be representative of similar locations not in their immediate vicinity.

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| | | | |
|---|--|---|--|
| | regional scale ozone concentrations | | 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 (1 000 to 10 000 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. |
| <p>a Sampling points should, where possible, be representative of similar locations not in their immediate vicinity.</p> | | | |

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⁽¹⁾.

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.

ANNEX IX

Criteria for determining the minimum number of sampling
points for fixed measurement of concentrations of ozone

[^{F1}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 (× 1 000) | Agglomeration ^a | Other zones ^a | Rural background |
|----------------------|--|--|---|
| < 250 | | 1 | 1 station/50 000 km ² as an average density over all zones per country ^b |
| < 500 | 1 | 2 | |
| < 1 000 | 2 | 2 | |
| < 1 500 | 3 | 3 | |
| < 2 000 | 3 | 4 | |
| < 2 750 | 4 | 5 | |
| < 3 750 | 5 | 6 | |
| > 3 750 | One additional station per 2 million inhabitants | One additional station per 2 million inhabitants | |

a 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.

b 1 station per 25 000 km² for complex terrain is recommended.]

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 100 000 km².

ANNEX X

MEASUREMENTS OF OZONE PRECURSOR SUBSTANCES

A.Objectives

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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 NO₂), and appropriate volatile organic compounds (VOC). A list of volatile organic compounds recommended for measurement is given below:

| | 1-Butene | Isoprene | Ethyl benzene |
|-----------|-----------------|-----------------|--------------------------------|
| Ethane | Trans-2-Butene | n-Hexane | m + p-Xylene |
| Ethylene | cis-2-Butene | i-Hexane | o-Xylene |
| Acetylene | 1,3-Butadiene | n-Heptane | 1,2,4-Trimethylebenzene |
| Propane | n-Pentane | n-Octane | 1,2,3-Trimethylebenzene |
| Propene | i-Pentane | i-Octane | 1,3,5-Trimethylebenzene |
| n-Butane | 1-Pentene | Benzene | Formaldehyde |
| i-Butane | 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.

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) |

a 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.

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| | |
|---------------------------|---|
| 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 % ^a of the one hour values or (if not available) 24-hour values over the year |

a 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.

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 %) | — ^a |
| One day | 125 µg/m ³ , not to be exceeded more than 3 times a calendar year | None | — ^a |
| Nitrogen dioxide | | | |
| One hour | 200 µg/m ³ , 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/m ³ | 50 % on 19 July 1999, decreasing on 1 January 2001 and every 12 months thereafter by equal annual percentages | 1 January 2010 |

a Already in force since 1 January 2005

b 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.

c 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 1 000 m from such specific sources.

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| | | | |
|---|---|--|----------------|
| | | to reach 0 % by 1 January 2010 | |
| Benzene | | | |
| Calendar year | 5 µg/m ³ | 5 µg/m ³ (100 %) on 13 December 2000, decreasing on 1 January 2006 and every 12 months thereafter by 1 µg/ m ³ to reach 0 % by 1 January 2010 | 1 January 2010 |
| Carbon monoxide | | | |
| maximum daily eight hour mean ^b | 10 mg/m ³ | 60 % | — ^a |
| Lead | | | |
| Calendar year | 0,5 µg/m ^{3c} | 100 % | — ^c |
| PM₁₀ | | | |
| One day | 50 µg/m ³ , not to be exceeded more than 35 times a calendar year | 50 % | — ^a |
| Calendar year | 40 µg/m ³ | 20 % | — ^a |
| a Already in force since 1 January 2005 | | | |
| b 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. | | | |
| c 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/m ³ . The area in which higher limit values apply must not extend further than 1 000 m from such specific sources. | | | |

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 km² or an entire zone or agglomeration, whichever is the smaller.

| Pollutant | Alert threshold |
|------------------|-----------------------|
| Sulphur dioxide | 500 µg/m ³ |
| Nitrogen dioxide | 400 µg/m ³ |

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B. Information and alert thresholds for ozone

| Purpose | Averaging period | Threshold |
|-------------|---------------------|------------------------------|
| Information | 1 hour | 180 $\mu\text{g}/\text{m}^3$ |
| Alert | 1 hour ^a | 240 $\mu\text{g}/\text{m}^3$ |

a For the implementation of Article 24, the exceedance of the threshold is to be measured or predicted for three consecutive hours.

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 $\mu\text{g}/\text{m}^3$ | None |
| Oxides of nitrogen | | |
| Calendar year | 30 $\mu\text{g}/\text{m}^3$ NO _x | None |

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 $\mu\text{g}/\text{m}^3$ (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

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| Exposure reduction target relative to the AEI in 2010 | | Year by which the exposure reduction target should be met |
|--|---|--|
| Initial concentration in $\mu\text{g}/\text{m}^3$ | 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 $18 \mu\text{g}/\text{m}^3$ | |

Where the AEI in the reference year is $8,5 \mu\text{g}/\text{m}^3$ 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 $8,5 \mu\text{g}/\text{m}^3$ 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 |
|--|--|
| $20 \mu\text{g}/\text{m}^3$ | 2015 |

D. Target value

| Averaging period | Target value | Date by which target value should be met |
|-------------------------|-----------------------------|---|
| Calendar year | $25 \mu\text{g}/\text{m}^3$ | 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 | $25 \mu\text{g}/\text{m}^3$ | 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 |

a 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.

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STAGE 2^a

| | | | |
|---------------|----------------------|--|----------------|
| Calendar year | 20 µg/m ³ | | 1 January 2020 |
|---------------|----------------------|--|----------------|

a 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.

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 (km²) 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

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- (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⁽²⁾;
 - 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⁽³⁾;
 - 3. Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control⁽⁴⁾;
 - 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⁽⁵⁾;
 - 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⁽⁶⁾;
 - 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⁽⁷⁾;
 - 7. Council Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels⁽⁸⁾;

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8. Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste⁽⁹⁾;
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⁽¹⁰⁾;
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⁽¹¹⁾;
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⁽¹²⁾;
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⁽¹³⁾.
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,
 - (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;

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- (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.

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 PM₁₀), 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;

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- (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.

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) | — | — | — | — |

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| | | | | |
|---------------------|-------------------------------------|--|--------------------------------------|---|
| 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 |

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|---------------|-------------------------------------|--|---------------------------|----------------------------|
| 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 | — | — | — | — |
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| Article 33 | Article 13 | Article 12 | Article 10 | Article 15 |
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| Annex I | — | Annex VIII with amendments | Annex VI | Annex VII |
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| Annex VI | — | Annex IX with amendments | Annex VII | Annex VIII |
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| Annex IX | — | — | — | Annex V |
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| Annex XI | — | Annex I, section I, Annex II, section I and Annex III (with amendments); Annex IV (unchanged) | Annex I, Annex II | — |
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| Annex XIII | — | Annex I, section I, Annex II, section I | — | — |
| Annex XIV | — | — | — | — |
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- (1) [OJ L 334, 30.11.2006, p. 1.](#)
- (2) [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.](#)).
- (3) [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.](#)).
- (4) [OJ L 24, 29.1.2008, p. 8.](#)
- (5) [OJ L 59, 27.2.1998, p. 1.](#) Directive as last amended by Directive 2006/105/EC.
- (6) [OJ L 350, 28.12.1998, p. 58.](#) Directive as amended by Regulation (EC) No 1882/2003.
- (7) [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.](#)).
- (8) [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.](#)).
- (9) [OJ L 332, 28.12.2000, p. 91.](#)
- (10) [OJ L 143, 30.4.2004, p. 87.](#)
- (11) [OJ L 191, 22.7.2005, p. 59.](#)
- (12) [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.](#)).
- (13) [OJ L 114, 27.4.2006, p. 64.](#)