# COMMISSION OF THE EUROPEAN COMMUNITIES

COM(92) 236 final

Brussels, 26 May 1992

Amended proposal for a

COUNCIL DIRECTIVE

ON

**AIR POLLUTION BY OZONE**

(presented by the Commission pursuant to Article 149(3)
of the EEC-Treaty)

## EXPLANATORY MEMORANDUM

1. In June 1991 the Commission submitted a proposal for a Council Directive on air pollution by ozone (COM(91)220 final) based on Article 130s of the Treaty establishing the European Economic Community.

2. The European Parliament endorsed the Commission proposal on 14 May 1992 subject to certain amendments which it wished the Commission to incorporate into its proposal in accordance with Article 149(3) of the Treaty.

3. Of the 21 amendments tabled by Parliament, the Commission can accept five unreservedly (Nos 14, 15, 17, 19 and 20) and six others in part (Nos 1, 4, 6, 7, 9 and 22).

4. The text on the following pages takes account of the changes entailed.

5. The second recital and Article 6(1) and (2) and Article 8 have been amended to emphasize the need to take measures to limit the precursors of ozone, an Article 7a on this point has been added, and reference to the impossibility of adopting limit values has been deleted from the second recital.

6. The need to specify criteria for the establishment of measuring stations in order to increase the comparability of measurements has also been taken into account and has resulted in the amendment of Article 3.

7. The role of the European Environment Agency in the operational aspects of implementing the directive is also recognized and has been taken into account in Articles 4(3) and 6(1) (assuming that the agency is in operation by the time this directive comes into force.)

8. The need for a sufficiently large number of measurement points for the purposes of the directive has been added in Article 4(3) and Annex II.2.

9. Lastly, various practical points concerning the measurement of precursors and details regarding information for the public have been added to Annexes III and IV.

**Amended proposal for a Council Directive on air pollution by ozone**

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130s thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas the 1987 fourth Community action programme on the environment[1] provides for the possibility of action on photochemical pollution, and in particular ozone, in view of its harmful effects and the state of knowledge concerning its impact on human health and the environment;

Whereas, in order to protect human health, ozone concentrations in the air should be limited; whereas the scientific and technical information available and knowledge of the formation and transport of photochemical pollutants does not make it possible at present to adopt limit values for those concentrations;

Whereas, however, as complete a knowledge as possible of ozone pollution levels is required in all Member States;

Whereas, in order to protect human health, <u>measures must be taken to limit ozone and its precursors where concentration thresholds are exceeded; whereas</u> technical and scientific information <u>must be used and promoted</u> to enable limit values for these concentrations to be established;

1 OJ No C 328, 7.12.1989, p. 1.

Whereas to obtain this knowledge it is necessary to set up measurement stations to provide data on ozone concentrations in the air;

Whereas, in order to obtain comparable results, the methods used by the Member States to determine concentrations should be equivalent;

Whereas, in view of the special nature of photochemical pollution, the reciprocal exchange of information between the Member States and the Commission including, once it is effectively set up, the European Environment Agency,[2] is essential for a better understanding of the problem;

Whereas the setting of warning levels at which precautions should be taken by the public will make it possible to limit the impact of pollution episodes on health;

Whereas the numerical values of these levels should be based on the findings of work carried out in the framework of the World Health Organization (WHO), in particular as regards the dose-effect relationships established for the pollutant in question;

Whereas the information collected under this Directive will make it possible to monitor the development of air pollution by ozone and the impact of national and Community provisions to reduce photochemical precursors and establish in the future new provisions concerning ozone and air quality,

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2 OJ No L 120, 11.5.1990, p. 1.

HAS ADOPTED THIS DIRECTIVE:

Article 1

1. The purpose of this Directive is to establish a common procedure:
   - for monitoring,
   - for the exchange of information,
   - for warning,

   concerning air pollution by ozone in order to enable the competent authorities of the Member States and the Commission to obtain wider knowledge of this form of air pollution in the Community and guarantee a minimum amount of public information where concentration thresholds are exceeded and there may be a risk to human health or vegetation.

2. For the purposes of this Directive:

   - "health protection threshold" means the $O_3$ concentration value given in Annex I, point 1 beyond which there is a risk to human health in the event of prolonged pollution episodes;

   - "vegetation protection thresholds" means the $O_3$ concentration values given in Annex I, point 2 beyond which there is a risk to vegetation;

   - "warning threshold" means the $O_3$ concentration value given in Annex I, point 3 beyond which there is a risk to human health in the event of short exposure and at which steps must be taken by the Member States as specified in the following articles.

Article 2

Each Member State shall designate a central body responsible for problems concerning air pollution by ozone at national level, and shall forthwith inform the Commission thereof.

Article 3

Member States shall establish measuring stations to supply the data necessary for the application of this Directive. Such stations must meet the specifications in Annex II.

1. Member States shall establish measuring stations to supply the data necessary for the application of this Directive. Such stations must meet the specifications in Annex II.

2. The Commission shall specify, as soon as possible, the conditions which must be fulfilled by networks of stations for measuring $O_3$ and its precursors and adapt these, as necessary , according to the information arising from the actions referred to in article 4.3.

Article 4

1. For the measurement of $O_3$ concentrations, Member States shall use:

   - either the reference method referred to in Annex V;
   - or any other method of analysis shown to produce measurement results equivalent to those obtained using the reference method.

   To this end, each Member State shall designate one or more central laboratories responsible for evaluating the method used at national level in relation to the reference method.

   Furthermore, they shall organize at national level intercomparisons between laboratories taking part in the collection and analysis of the data.

2. Once the measuring stations have been established, Member States shall provide the Commission with the following information:

   - the method used to determine $O_3$ concentrations and, if it is different from the reference method, proof of its equivalence with the latter;
   - the geographical coordinates of the measuring stations, a description of the area covered by the stations, and the site-selection criteria;
   - the results of any indicative measurement programmes carried out under the provisions of Annex II, point 2.

3. The Commission may organize, on a Community scale, intercomparison programmes between central laboratories.

3. The Commission, with the assistance of the European Environment Agency, shall organize, at regular intervals, meetings with those responsible for measuring centres in the Member States with the aim of exchanging information and experience concerning photochemical pollution.

Article 5

Member States shall make the necessary arrangements for informing the public in accordance with Annex IV by the most appropriate means (radio, television, newspapers) where the warning value given in Annex I, point 3 is exceeded.

Article 6

| | |
|---|---|
| 1. As from [1 January 1994], Member States shall provide the Commission with the following information no later than three months following the annual reference period: | 1. As from [1 January 1994], Member States shall provide the Commission through the European Environment Agency with the following information no later than three months following the annual reference period: |
| - the maximum, the median and the 98th percentile of the mean values over one hour and eight hours recorded during the year in each measuring station; the percentiles shall be calculated in accordance with the method given in Annex III; | - the maximum, the median and the 98th percentile of the mean values over one hour and eight hours recorded during the year in each measuring station; the percentiles shall be calculated in accordance with the method given in Annex III; |
| - the number, date and duration of periods during which the thresholds in Annex I, points 1 and 2 are exceeded. | - the number, date and duration of periods during which the thresholds in Annex I, point 1 and 2, are exceeded; |
| | - the measures envisaged or taken to prevent the thresholds in Annex I, points 1 and 2, being exceeded. |
| 2. Where the warning threshold in Annex I, point 3 is exceeded, Member States shall inform the Commission no later than seven days following the period in question of: | 2. Where the warning threshold in Annex I, point 3, is exceeded, Member States shall inform the Commission no later than seven days following the period in question of: |
| - the date of the occurrence; | - the date of the occurrence; |
| - the duration of the occurrence; | - the duration of the occurrence; |
| - the maximum hourly concentration recorded during this period. | - the maximum hourly concentration recorded during this period; |
| | - measures envisaged or taken to restrict concentrations of $O_3$. |
| Where possible, this information should be supplemented by relevant data concerning sources of precursors and weather conditions which might explain the reasons for the occurrence. | (...) This information should be supplemented by relevant data concerning sources of precursors and weather conditions which might explain the reasons for the occurrence. |

3. Where the data referred to in paragraphs 1 and 2 above are available in the Member States for periods preceding the date referred to in Article 9 of this Directive, Member States shall send them to the Commission at the latest when they send the data relating to the first reference period.

Article 7

Member States and the Commission shall regularly exchange information concerning:

- the data collected under this Directive;
- measures taken or planned and programmes established by the Member States to improve air quality;
- experience and knowledge concerning the problem of photochemical pollution.

**Article 7a**

**The Member States shall inform the Commission of the means they propose to use to reduce ozone precursors in general and volatile organic compounds (VOC) and oxides of nitrogen (NOx) in particular to an acceptable level.**

Article 8

On the basis of the information collected, the Commission shall submit to the Council no later than [1 July 1997] a proposal on the control of air pollution by $O_3$, including in particular limit values for $O_3$ concentrations in the air and time limits for compliance therewith.

Article 9

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive no later than [31 December 1992]. They shall forthwith inform the Commission thereof.

When Member States adopt such provisions, they shall contain a reference to this Directive or shall be accompanied by such a reference at the time of their official publication. The procedures for making such a reference shall be laid down by the Member States.

Article 10

This Directive is addressed to the Member States.

Done at Brussels,

For the Council
The President

Article 8

On the basis of the information collected <u>and notably those obtained under the terms of article 7b above,</u> the Commission shall submit to the Council no later than [1 July 1997] a proposal on the control of air pollution by $O_3$, including in particular limit values for $O_3$ including in particular limit values for $O_3$ concentrations in the air and time limits for compliance therewith, <u>and the measures to be taken to reduce air pollution by $O_3$</u>.

# ANNEX I

Thresholds for ozone concentrations in the air[1]

(The values are expressed in µg $O_3/m^3$. The volume must be standardized at the following conditions of temperature and pressure: 293° K and 101.3 kPa).

1 - Health protection threshold
(Lengthy exposure)

110 $\mu g/m^3$ for the mean value over eight hours[2]

2 - Vegetation protection thresholds

200 $\mu g/m^3$ for the mean value over one hour
65 $\mu g/m^3$ for the mean value over 24 hours

3 - Health protection warning value
(Short exposure)

175 $\mu g/m^3$ for the mean value over one hour

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1 Concentrations must be measured continuously.
2 The mean over eight hours is a simple moving average calculated each hour h from the eight hourly values between h and h-9.

# A N N E X II

Monitoring of ozone concentrations

1. The purpose of measuring ozone concentrations in ambient air is to assess:

(i) as closely as possible the individual risk of exposure of human beings to values in excess of the health protection thresholds;
(ii) the exposure of vegetation (e.g. forests, natural ecosystems, crops) to the values given in Annex I.

2. The measurement points shall be located at geographically and climatologically representative sites where:

(i) the risk of approaching or exceeding the thresholds in Annex I is the highest;
(ii) it is likely that one of the targets mentioned in paragraph 1 is exposed.

At places where the Member States do not have information concerning the sites mentioned under (i) and (ii), they shall carry out indicative measurement programmes in order to determine the siting of the measurement points to supply the data necessary for the application of this Directive.

2. An adequate number of measurement points shall be located at geographically and climatologically representative sites where:

3. Member States shall establish additional measurement points in order:

(i) to contribute towards the identification and description of the formation and transport of ozone and its precursors;

(ii) to monitor changes in ozone concentrations in areas affected by background pollution.

iii) <u>to identify concentrations or sources of natural emissions.</u>

Parallel measurement of photochemical precursors (oxides of nitrogen, volatile organic compounds) is recommended in order to make it possible to identify links between the different pollutants.

<u>In the measurement stations mentioned in points 1 and 2 above, the concentrations of oxides of nitrogen and, if possible, those of organic compounds will be measured in parallel with $O_3$</u> in order to make it possible to identify links between the different pollutants.

4. The final reading of the measurement instruments must be carried out in such a way that the mean values over one hour and eight hours can be calculated, in accordance with the provisions of Annex III.

# ANNEX III

## Calculation of the measurement results for the annual reference period

1. Concentrations must be measured continuously.

2. The annual reference period shall begin on 1 January and end on 31 December in any given calendar year.

3. For the validity of the calculation of the percentiles* to be recognized, 75% of the possible values must be available and, as far as possible, distributed uniformly throughout the period in question for the particular measurement site. If that is not the case, this fact must be mentioned when the results are communicated.

   The calculation of the 50th (98th) percentile on the basis of the values recorded throughout the year shall be carried out as follows: the 50th (98th) percentile must be calculated from the values actually measured. The measured values shall be rounded off to the nearest $\mu g/m^3$. All the values are to be listed in increasing order for each site:

$$X_1 \leq X_2 \leq X_3 \leq \ldots\ldots \leq X_k \leq \ldots\ldots \leq X_{N-1} \leq X_N$$

The 50th (98th) percentile is the value of k, to be calculated from the following formula:

$$k = 0.50\ (0.98).N$$

N being the number of values actually measured. The value of 0.50 (0.98).N shall be rounded off to the nearest whole number.

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* The median shall be calculated as the 50th percentile.

# ANNEX IV

The information set out below must be circulated on a sufficiently large scale as soon as possible to enable the public to take all appropriate preventive protective action.

Standard text for informing the public about a high level of ozone in the air

Situation

Today,[1] at ..... hrs, significant concentrations of ozone in the air were recorded.

At the following measurement points: .....,

concentrations in excess of 175 $\mu g/m^3$ (European warning value) were recorded.

The details of the recorded values are as follows:

| Station | Time | Concentration (hourly mean) |
|---|---|---|
| | | |

Forecast:

Since no significant change in weather conditions is foreseeable in the next few days, significant concentrations can still be expected tonight/tomorrow/this weekend between ..... hrs and ..... hrs

or

The most recent weather forecasts indicate an improvement in the situation by ..... hrs/ within ..... days.

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1 Where information is provided in newspapers a reference to the previous day may be added.

Precautions:

- As a precaution, those people who are particularly at risk from air pollution (children, the elderly, people with respiratory problems, etc.) should avoid unaccustomed physical effort and all outdoor exercise during the next ..... hours.

  In general, it is recommended that sustained physical effort (e.g. jogging) should be avoided during this period.

- For the public in general, it is recommended that all physical effort should be avoided. A number of symptoms such as eye irritations, headaches, respiratory difficulties and a reduction in physical capacities may occur.[1]

- As a precaution, those people who are particularly at risk from air pollution (children, the elderly, people with respiratory problems, etc.) and persons particularly sensitive to ozone should avoid unaccustomed strenuous physical activity outdoors during the next ... hours.

Counter-measures

While $O_3$ concentrations continue to exceed permissible levels, the following measures shall be taken to restrict $O_3$ in the atmosphere:

1 This paragraph is to be added in the event of concentrations in excess of 350 $\mu g/m^3$.

# A N N E X V

## Reference method of analysis to be used for the purposes of this Directive

### I. GENERAL

The reference method of analysis used to determine ozone shall be the chemiluminescence method. This method is being standardized by the ISO. Once the latter has published the standard in question, the method described therein shall constitute the reference method.

The following points must be taken into consideration when the measurement methods and instruments are used by the Member States in the field:

1. The conformity of the operating characteristics of the measurement instrument with those indicated by the manufacturer, in particular background noise, response time and linearity, must be verified in the laboratory.

2. The instrument must be totally calibrated regularly, using ad hoc preconditioned standard gases.
   The potassium iodide method or the method based on gas titration using NO as reagent is to be used in parallel in the laboratory to analyse the $O_3$ content of the standard gases and/or the accuracy and precision of the other methods of measurement provided for in Article 4 (double-checking principle).

   Special care must be taken with regard to interferences inherent in the method and the instrument in order to optimize flow rates and guarantee the condition of the apparatus during the calibration procedure.

3. In the field, the instruments must be calibrated regularly, e.g. every 23 or 25 hours.
   In addition, the validity of the calibration must be verified by regularly operating in parallel an instrument calibrated in accordance with paragraph 1.
   If the instrument inlet filter is changed before calibration, calibration must be carried out after an appropriate period of exposure (from 30 minutes to several hours) of the filter to ambient $O_3$ concentrations.

4. The sampling head must be placed at least 1 m away from buildings in order to avoid any screening effect.

5. The sampling head opening must be protected against rain and insects. No prefilter is to be used.

6. Sampling must not be influenced by adjoining installations (the air-conditioning or data-transmission equipment).

7. The sampling line must be of inert material (e.g. glass, PTFE, stainless steel) which is not affected by the presence of $O_3$. It must be exposed beforehand to appropriate $O_3$ concentrations.

8. The sampling line between the sampling head and the analysis instrument must be as short as possible. In particular, the time taken for the gas volume sample to pass through the sampling line must be as short as possible (e.g. of the order of a few seconds in the presence of other reagents such as NO).

9. Condensation in the sampling line must be avoided.

10. The sampling line must be cleaned regularly, taking local conditions into account.

11. The sampling line must be tight and the flow rate must be inspected regularly.

12. Sampling must not be influenced by gas discharges from the instrument or from the calibration system.

13. All necessary precautions must be taken to prevent temperature variations from producing measurement errors.

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