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ANNEX III

GUIDELINES ON A STRATEGY TO MEASURE OZONE PRECURSORS ACCORDING TO ARTICLE 9(3) OF DIRECTIVE 2002/3/EC

Member States are required by Article 9(3) of Directive 2002/3/EC to monitor ozone precursors at least in one measuring station. According to the paragraph on guidance, an appropriate strategy for this monitoring shall be given. Annex VI of Directive 2002/3/EC further states that the objectives of such monitoring should be:

- to analyse trends,
- to check efficiency of emission reduction strategies,
- to check consistency of emission inventories,
- to help attribute the contribution of emission sources to pollution concentration,
- to support the understanding of ozone formation and precursor dispersion,
- to support the understanding of photochemical models.

1. RECOMMENDATIONS FOR A MONITORING STRATEGY

The foremost objective of monitoring ozone precursors should be to analyse trends and thereby check the efficiency of emission reductions. Additional source related trend analyses are recommended.

To check the consistency of inventories and to attribute the contribution of particular sources is considered a rather difficult task on a regular basis in the monitoring networks. With one mandatory station alone, these objectives cannot be reached. Consequently, additional voluntary measurements nationally or in international cooperation are recommended. While for trend analysis long-term continuous monitoring is indispensable, measurement campaigns are more appropriate for source attribution studies. During such measurement campaigns it is recommended to analyse the full spectrum of the VOC listed in Annex VI to Directive 2002/3/EC. To support the understanding of ozone formation, of precursor dispersion, and of photochemical models, in addition to the VOC listed in Annex VI to Directive 2002/3/EC, measurements of photo-reactive species (e.g. HO₂- and RO₂-radicals, PAN) are advisable. For this more research oriented monitoring, again, measurement campaigns are recommended.

It may be supposed that the NO_x monitoring is covered by following the requirements of Directive 1999/30/EC. Parallel monitoring of VOC with NO_x is recommended.

1.1. Recommendations for the location of the mandatory measuring station

Each Member State shall set up at least one station to analyse the general trend of the precursors. It is recommended to place the corresponding station monitoring the full spectrum of VOC listed in Annex VI to Directive 2002/3/EC at a site representative for precursor emissions and ozone formation. Preferably this site should be located in the urban background and should not be directly influenced by local strong sources such as traffic or large industrial installations.

1.2. Further Recommendations

1.2.1. Monitoring rural background concentrations

Measurements of VOC at rural background stations are part of the EMEP monitoring programme. It is particularly recommended to set up monitoring sites in those areas where no EMEP monitoring sites exist. In the south it should be considered to include some of the most abundant biogenic hydrocarbons, e. g. the monoterpenes α -pinene and limonene, in the monitoring programme.

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1.2.2. Source oriented monitoring

Major sources of VOC are road traffic, particular industrial plants and the use of solvents. The compounds to be monitored for analysing trends depend on the source type whereby the following strategy is recommended.

— Road traffic

BTX-monitoring is useful to analyse trends in emissions from road traffic but monitoring of more components, e.g. acetylene, may be necessary. With regard to the expected reduction of benzene in fuels it should be ensured that in any case toluene and xylenes are analysed. The full VOC spectrum should be monitored at least at one traffic site. In general strong similarities in spectrum may be expected at different sites with similar characteristics of the vehicle fleet.

— Industrial plants

Petrochemical plants emit a broad spectrum of VOC. The decision on compounds to be monitored depends strongly on this spectrum and must be based on a case-by-case study. At least one monitoring station should be located upwind and downwind of the major sources with respect to the prevailing wind direction.

— Solvent use (commercial areas)

The decision on the selection of VOC to be monitored is most difficult in this case, as there may be several minor sources. It should be based on any knowledge on the spectrum emitted giving also regard to cover those with the highest ozone production potential.

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Changes and effects yet to be applied to :

- Decision revoked by [2023 c. 28 Sch. 1 Pt. 2](#)

Changes and effects yet to be applied to the whole legislation item and associated provisions

- Annex 1 heading words omitted by [S.I. 2018/1407 reg. 3\(4\)\(a\)\(i\)](#)
- Annex 1 heading words omitted by [S.I. 2018/1407 reg. 3\(4\)\(a\)\(ii\)](#)
- Annex 1 words omitted by [S.I. 2018/1407 reg. 3\(4\)\(b\)](#)
- Annex 1 words omitted by [S.I. 2018/1407 reg. 3\(4\)\(c\)](#)
- Annex 1 para. 3 words omitted by [S.I. 2018/1407 reg. 3\(4\)\(d\)](#)
- Art. 1(1) words inserted by [S.I. 2018/1407 reg. 3\(2\)\(a\)\(ii\)](#)
- Art. 1(1) words substituted by [S.I. 2018/1407 reg. 3\(2\)\(a\)\(i\)](#)
- Art. 1(2) words omitted by [S.I. 2018/1407 reg. 3\(2\)\(b\)\(ii\)](#)
- Art. 1(2) words substituted by [S.I. 2018/1407 reg. 3\(2\)\(b\)\(i\)](#)
- Art. 1(3) words inserted by [S.I. 2018/1407 reg. 3\(2\)\(c\)\(i\)](#)
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- Annex 3 word omitted by [S.I. 2018/1407 reg. 3\(5\)\(b\)\(iv\)\(bb\)](#)
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- Annex 3 words omitted by [S.I. 2018/1407 reg. 3\(5\)\(b\)\(ii\)](#)
- Annex 3 words omitted by [S.I. 2018/1407 reg. 3\(5\)\(b\)\(iii\)](#)
- Annex 3 words omitted by [S.I. 2018/1407 reg. 3\(5\)\(b\)\(iv\)\(aa\)](#)
- Annex 3 words substituted by [S.I. 2018/1407 reg. 3\(5\)\(b\)\(i\)](#)
- Annex 3 point 1.1 words substituted by [S.I. 2018/1407 reg. 3\(5\)\(c\)](#)