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Item 4(a) of the provisional agenda

**CONTROL OPTIONS/TECHNIQUES FOR VOLATILE ORGANIC COMPOUNDS (VOCs)
EMISSIONS FROM STATIONARY SOURCES^{*/}**

Final summary report by the Chairman of the Task Force

1. The Task Force on the Assessment of Abatement Options/Techniques for Volatile Organic Compounds completed its activities in accordance with the work plan for the implementation of the Convention (ECE/EB.AIR/49, annex I, item 4.3).

2. Experts from 17 Parties participated in the work of the Task Force, especially in the establishment of the database and the drafting of the documents: Austria, Canada, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Poland, Russian Federation, Slovakia, Spain, Sweden, Switzerland, Ukraine and United Kingdom. An expert of the European Chemical Industry Council (CEFIC) also participated.

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^{*/} This document has not been formally edited.

3. Four meetings took place to prepare the documents, to discuss the general methodology, organize the flow of information, and provide for a harmonized assessment of the technological background. The meetings were held in Angers (France) 10-11 February 1997, Stockholm (Sweden) 2-4 September 1997, Copenhagen (Denmark) 11-12 December 1997, and Maastricht (Netherlands) 23-24 April 1998. In addition, a drafting group composed of several members of the Task Force and the Secretariat met in Karlsruhe on 23 October 1998 to finalize the draft annexes in light of the comments received at the sixth session of the Working Group and afterwards (EB.AIR/WG.6/1998/2, para. 23).

4. The Task Force has prepared a draft annex on control techniques for emissions of VOCs from stationary sources (EB.AIR/WG.6/1998/5/Rev.2) and a draft annex on related limit values for VOCs (EB.AIR/WG.6/1998/6/Rev.2). Both documents were based on background reports, compiled by the Task Force, documenting best available technologies (BAT) for VOCs and providing information on existing limit values for VOCs from various stationary sources in several Parties to the Convention.

5. The VOC Task Force has prepared draft background documents concerning currently valid limits and best available techniques with regard to the reduction of VOC emissions.

6. The draft background document on limit values is based on a questionnaire which has been distributed to the Parties. Many Parties have provided detailed information on their currently applied limit values for VOC emissions. This document served as a basis for the establishment of the draft technical annex on limit values and gives a consistent overview of current emission reduction systems for several Parties to the Convention. Limit values are presented according to the nomenclature of the European CORINAIR emission inventory activity (SNAP) in order to harmonize the approaches and facilitate the transfer of knowledge.

7. The draft background document on best available techniques includes information provided by plant operators, producers of VOC control equipment and members of the Task Force. The document is based as well on official documentation of the Executive Body and its subsidiary bodies. It gives the present status of development and application of best available techniques and related costs for the reduction of VOC emissions from stationary sources in the main emitting source categories. Best available techniques for the limitation/reduction of VOC emissions are presented according to the CORINAIR source categories. Besides a general descriptive part for each sector, abatement options are presented in terms of achievable emission factors, investments and operating costs, based on the reference installation approach. Moreover, side effects have been addressed. This approach allows for the assessment of economic properties of facilities depending on their capacity and, thus, can serve as a basis for strategic cost assessments, for instance in the development of emission reduction strategies in an international framework for determining cost functions.

8. To clarify the database and methodology and to present these to a broader public, a Workshop on the Elaboration and Evaluation of Techno-Economic Databases on Production Processes and Related Emission Abatement Options was held in Karlsruhe, Germany, on 19-20 February 1998. It was attended by experts from 19 Parties to the Convention (EB.AIR/WG.6/1998/3). This Workshop followed the Workshop on VOC Abatement Options and their Costs

for Use in Integrated Assessment Modelling, held in Karlsruhe, on 28-30 October 1996. In order to continue this activity, a further Workshop has been scheduled for 28-29 October 1999 in Angers, France, focussing on techno-economic data bases on production processes and related emission abatement options.

9. In contrast to other major air pollutants (e. g. SO₂ and NO_x), NMVOC are emitted from a large variety of different and mostly small sources. NMVOC emissions are normally mixtures of organic substances with variable composition. There are many organic compounds which are volatile, such as vapours from solids with a high melting point.

10. Source categories have also been established according to the nomenclature of the European CORINAIR emission inventorying activity (SNAP 90) in order to harmonize the approaches and facilitate the transfer of knowledge. The relevance of the chosen source categories is illustrated in table 1. The contribution from the different sectors to total emissions can vary significantly from Party to Party depending on the structure of its industry.

Table 1. Stationary source categories of NMVOC emissions for the year 1990 for Europe (28 countries*)

CORINAIR 94 SNAP source category	NMVOC emission source categories	Sectoral NMVOC emission [Gg]	Contribution to total emissions [%]
02 00 02	1.Residential combustion installations (< 50 MW _{th})	1,091	13.6
04 01 00	2.Mineral oil refineries	288	3.6
05 00 00	3.Extraction and distribution of fossil fuels	1,324	16.5
04 05 00	4.Installations for the production of basic organic chemicals	388	4.8
06 04 05	5.Adhesive coating (incl. wood and plastic lamination)	186	2.3
06 01 01 06 01 07	6.Coating processes (metal and plastic surfaces in: passenger cars, truck cabins, trucks, buses; wooden surfaces)	(685)	8.5
06 01 03 06 01 04	7.Coating processes (metal, plastic, and wood surfaces in: architectural and domestic use of paints)	564	7.0
06 01 05	8.Coil coating	(58)	0.7
06 02 02	9.Dry-cleaning	125	1.6
06 03 07 06 05 08 06 03 09	10.Manufacturing of coatings, varnishes, inks and adhesives	183	2.3
06 03 06	11.Manufacturing of pharmaceutical products	116	1.4
06 04 03	12.Printing (flexography, heat set web offset, publication rotogravure, rotogravure, screen printing)	278	3.5
06 03 05	13.Conversion of natural or synthetic rubber	79	1.0
06 02 01	14.Surface cleaning	400	5.0
06 04 04	15.Vegetable oil extraction and fat and vegetable oil refining processes	88	1.1
06 01 02	16.Vehicle refinishing	(108)	1.3

CORINAIR 94 SNAP source category	NM VOC emission source categories	Sectoral NM VOC emission [Gg]	Contribution to total emissions [%]
06 04 06	17.Impregnation of wooden surfaces	136	1.7
06 04 01	18.Glass wool enduction	86	1.1
06 04 08	19.Domestic solvent use	492	6.1
04 06 05	20.Bread production and other food manufacturing	157	2.0
04 06 07	21.Beer production	55	0.7
04 06 08	22.Spirits production	56	0.7
	TOTAL EMISSIONS	6,943	86.5

The values in brackets are derived from aggregated figures: the CORINAIR nomenclature of 1990 differs from that of 1994 (differing sector boundaries in inventories), thus the aggregation level of emission inventories of 1990 does not correspond in some cases to those for 1994.

* Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom.

11. The presentation of best available technology options in the BAT background document for reducing NM VOC emissions from the chosen sectors consists of a descriptive part and a data sheet for each sector. Less relevant sectors are covered by a brief description. For the determination of national cost functions, a methodology has been developed allowing all major emission sectors to be described in a homogeneous and consistent way with special emphasis on cost aspects. This methodology focuses on the installation level, since the applicability, efficiency and costs of emission reduction measures largely depend on the characteristics of the installations (used process, size of installation, measures already in place, etc.). As the applicability, efficiency and costs of emission reduction measures vary widely depending on the emission sources, cost functions cannot be determined on a sector-wide level, but must take into account the characteristics of the installations. Therefore, the 'reference installation' approach has been developed.

12. To build on these accomplishments, any future work should take the following into account:

(a) Concerning best available technologies:

(i) Extend the list of sectors, if useful in terms of their emissions;

(ii) Address natural sources and agriculture more in depth when more information is available on abatement options;

(iii) Continuously update the techno-economic database to track the ongoing technical progress, especially in emission abatement options/techniques;

(iv) Develop databases to determine the remaining emission reduction potential for the considered countries; this also requires some continuous activity;

(v) Establish an adequate link between the process level covered in this Task Force and via sectors to the national level reflecting compliance aspects since compliance considerations will require information on actual emissions (processes, emission factors, activities).

(vi) Address all relevant precursors of ozone formation (such as CO);

(vii) Focus the characterization of technologies more on their optimization, including cross-media aspects. Develop an adequate methodology for such an approach (e.g. based on life-cycle analysis (LCA));

(b) Concerning limit values:

(i) Strengthen multinational cooperation, as comparability of limit values is limited. Environmental legislation, especially emission limits, including their design, may have important economic and/or social impacts. Therefore, in the international context and in view of any compliance discussion, an evaluation of these legislative frameworks should be assessed according to such criteria as eco-efficiency. Such an evaluation would follow a bottom-up approach, from mass and energy flows, licensing procedures, etc. to more aggregated macroeconomic impacts such as competitiveness. For such a comprehensive task, an expert group should be set up to bring together technical, economic and legal aspects;

(ii) Keep track of the national emission limit systems as they continually change and adapt to international requirements. This could then serve as a basis for discussion for all interested Parties in order to improve their emission reduction strategies;

(iii) Cooperate with the newly established Implementation Committee.