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WORKSHOP ON CONTROL TECHNOLOGIES FOR EMISSIONS FROM STATIONARY SOURCES

Prepared by the Organizing Committee in collaboration with the secretariat

Introduction

1. In accordance with the work-plan for the implementation of the Convention (ECE/EB.AIR/75, annex VI, item 1.7) and at the invitation of the Government of Poland, the Workshop on Control Technology for Emissions from Stationary Sources was held in Warsaw from 5 to 7 December 2001.

2. The workshop was attended by participants from the following Parties: Belgium, Canada, Czech Republic, France, Germany, Hungary, Italy, Latvia, Poland, Sweden, Switzerland and the United Kingdom. Representatives from the Oil Companies' European Organisation for Environment, Health and Safety (CONCAWE) and the Union of the Electricity Industry (EURELECTRIC-EDF) also participated, as well as a member of the UNECE secretariat.

3. Mr. Andrzej Jagusiewicz (Poland) served as Chairperson of the workshop and Ms. Elisabeth Schmid (Germany) served as Vice-Chairperson.

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I. OBJECTIVES OF THE WORKSHOP

4. The objective of the workshop was to review the methods and techniques used by Parties to control emissions from stationary sources of pollutants covered by the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, and to identify, on that basis, control options and techniques, including techno-economic aspects (e.g. data on comparative investment and operating costs of abatement procedures).

5. In addition, the workshop was intended to review the preparations of Signatories to the Gothenburg Protocol to meet their control obligations, and to serve as a forum for the exchange of information on technological progress and emerging technologies between Western countries and countries with economies in transition.

II. KEY DISCUSSION POINTS BY TOPIC

6. Mr. Stanislaw Kaminski (Poland) opened the workshop, welcoming participants on behalf of the Ministry of Environment. The Chairman outlined the objectives in the context of the work-plan of the Executive Body, in particular the obligations of the Gothenburg Protocol and the preparedness of countries with economies in transition to comply with their emissions ceilings. He also noted that the Government of Poland had been willing to support the participation in the workshop for representatives of nine countries with economies in transition, but that none of these countries had applied for support.

A. Integrated strategies for reducing air emissions

7. Successful application of the multi-pollutant and multi-effect approach according to the Gothenburg Protocol calls for the further development and application of integrated assessment (IA) modelling, in particular: (a) the extension of regional IA modelling to particulate matter (PM) emissions, depositions and ozone; and (b) the development and application of national scale IA modelling tools to support emission reduction strategies with consideration of direct environmental and health benefits (e.g. national-scale version of RAINS for Poland – Systems Research "EnergSys", and other versions of RAINS).

8. Further significant developments for the application of IA modelling should include: (a) local and urban-scale modelling, and (b) integration of global problems' modelling (greenhouse gases and climate issues) with the modelling of regional environmental problems such as acidification, eutrophication and ground-level ozone. The application of IA models on a national level can assist in the development of cost-effective environmental protection strategies, which seek to optimize the relationship between environmental and health benefits and the costs of a

given strategy. The IA methodology requires highly skilled staff and sufficient financial resources. Beyond active participation in the Task Force on Integrated Assessment Modelling, it is recommended that an international structure (a network of IAM modelling centres) should be created to support the development of IA applications in Europe. Such centres could cover various areas of IA activities, including:

(a) Emission scenario development;
(b) Assessment of activity-related measures;
(c) Techno-economic databases;
(d) Transport and deposition of pollutants;
(e) Mapping of critical loads / critical thresholds.

9. The critical loads approach allows countries to choose different receptors according to their priorities. So countries with widely varying ecosystems have some leeway in selecting those for setting their environmental targets.

10. Close cooperation by newly-founded IA modelling centres in Central and Eastern Europe would improve their potential for undertaking policy-relevant studies, national as well as international. On the other hand, differences in technical standards between countries may result in varying competitive positions of industrial enterprises, thus distorting the market. The effort to equalize the competitive positions of industrial plants in different countries (i.e., provide a level playing field) is an important driving factor in the tightening of European Community (EC) technical standards and their implementation.

11. The most efficient solution should be based on a mix of technical standards and economic instruments; technical standards define minimum environmental requirements, while economic instruments stimulate further environmental protection.

12. As energy processes are a major source of several air pollutants, new environmental protection (economic) instruments should consider the ongoing processes of creating an open European energy market. Liberalization of the energy market is a good argument for recommending emissions trading as a cost-efficient mechanism for emission reduction at the national and international level, provided environmental criteria are observed. On the other hand, renewable energy production needs support in order to abate acidification, eutrophication and oxidant-producing pollutants over the long term.

13. The importance of links with other environmental conventions should be underlined, including the United Nations Framework Convention on Climate Change, with the aim of forging synergies between conventions and strengthening the integrated approach, according to the

principles of the Clean Air for Europe (CAFE) programme, with respect to inter-sectoral aspects.

B. NOx and SOx (acidifying emission control options for stationary sources)

14. NOx and SOx emissions from stationary sources result, to a large extent, from conventional power generation using fossil fuels. Process-integrated measures (especially for NOx) often entail multi-pollutant emission reductions and these should be considered at an early stage. The main targets are pollution prevention plus minimization of waste, plus energy efficiency and safety.

15. Significant improvements in acidifying emission reductions at stationary sources can be reported in many countries. Ambitious environmental targets encourage countries to make consistent and continuous progress. Low-NOx (primary/secondary) and low-SOx (fuel switch/secondary) technologies are increasingly available and should be an integral part of the planning process for new and retrofitted installations.

16. In many countries, especially countries with economies in transition, there is a high potential for pollutant emission reductions by applying combined strategies, e.g. increased energy efficiency, combined with the consequent introduction of energy-saving measures, and the switching of fuels, such as from coal to gas.

17. The European Commission suggests CO_2-certificate trading and has high expectations: candidates for European Union (EU) membership in particular should consider strategies for combined CO_2/pollutant reduction.

18. New promising technologies are being developed (e.g. in catalytic combustion) but these must prove their wide applicability on an industrial scale. The International Conference on Atmospheric Pollution—NOx and N_2O Emission Control (Paris, March 2001) gave a good overview of this.

19. The use of low-sulphur fuel is recommended but economic constraints must be taken into account.

20. The use of low temperature heat from combustion processes (e.g. district heating) continues to have a high potential. Its application would increase overall energy efficiency and thus reduce CO_2 and other pollutant emissions.

C. Control of non-methane volatile organic compounds (NMVOC), including NMVOC-containing products

21. Available NMVOC emission prevention and control measures meet the emission limit values of the Gothenburg Protocol.

22. A solvent management plan, as foreseen in the EC solvent directive, allows a plant operator to choose how to achieve emission reductions equivalent to emission limit values.

23. Using combined control and prevention measures, effective emission reductions can be achieved at reasonable cost. For very small installations, this may be problematic due to the higher investment costs.

24. The side-effects of emission abatement options/techniques should be taken into account. Furthermore, waste generation must be dealt with when using control techniques such as catalytic incineration or activated carbon adsorption since these generate used catalysts or deactivated carbon. Additional energy consumption may be related to the secondary measures required.

D. Particle emission control options

25. Powerful techniques to reduce and prevent particulate matter (PM) emissions (such as fabric filters, electrostatic precipitators, etc.) are available and should be applied broadly.

26. Considerable research work is under way to provide an in-depth understanding and interpretation of PM formation, control, measurement and effects. However, much more is needed.

27. In certain sectors (e.g. iron and steel making, material handling and storage) significant contributions of PM result from fugitive emission sources. More work is needed to quantify these emissions.

28. Emissions of precursors (e.g. SOx, NOx) for secondary PM formation (apart from NH_3) are expected to decrease by about 50% in the EU in 2005 compared to 1990.

29. More clarification is needed on the emission-transmission-effects relationships.

30. The multi-pollutant approach increases the importance of primary pollution control and energy-saving measures as well as of structural changes.

31. Many pollutant emissions result from energy generation: intelligent energy management (fuel and technology switching, good housekeeping, energy saving, demand-side management) has the potential to substantially reduce energy consumption and consequently pollution.

32. There is a need to assess efficiency (technical and financial) to determine effective mixes of instruments and measures from among the great number of possibilities that are applicable under country-specific conditions.

E. Techno-economic characterization of emission abatement options/techniques, including cost calculation

33. To create and maintain techno-economic databases, national techno-economic centres should be created. Techno-economic databases on air pollution abatement options are needed as input data for IA models; and base information for the elaboration of the technical annexes to the Gothenburg Protocol.

34. France offered to be lead country for the new Expert Group on Techno-economic Issues. According to the work-plan for the implementation of the Convention (ECE/EB.AIR/75, annex VI, item 1.6), the objectives of the Expert Group are: to further explore best available techniques (BAT) for emission abatement, their efficiency and costs; to develop techno-economic databases and methodologies for evaluation of uncertainties; and to draw up draft revisions of techno-economic issues in annexes to protocols, including those on persistent organic pollutants (POPs) and heavy metals.

35. Validated techno-economic data are currently requested in the context of several air pollution-related activities (the Convention's work, the European Integrated Pollution Prevention and Control Bureau / BAT reference documents, and the European Commission's CAFE Programme, the United Nations Framework Convention on Climate Change). In order to optimize the available expertise and ensure the coherence of information, it is recommended that the corresponding work of the new Expert Group should be carried out in close cooperation with these programmes.

F. Small-scale heating appliances using biomass fuel

36. The types of small-scale heating appliances vary from country to country. To have a better understanding of these types and their standards, there is a need for an inventory of existing appliances. Emissions of VOCs, particulate matter and carcinogens from small-scale heating can be high; there are also local problems with odour. There are several options to reduce emissions.

For instance, old installations can be replaced or supplemented with new techniques. Information about the correct handling of the installations is also important, as are methods for testing them.

G. Exchange of technology

37. Taking into account the Polish experience that led to Poland's proposal to create a technology centre in order to successfully implement its National Environment Policy, the workshop considered that it could be useful to transfer this idea to other countries with economies in transition. The participants considered it useful to organize a future workshop, e.g. on the subject of PM control techniques.

III. CONCLUSIONS AND RECOMMENDATIONS OF THE WORKSHOP

38. The workshop made the following conclusions and recommendations:

(a) Exchange of information on techniques/technologies is useful, particularly for countries with economies in transition, provided the quality of the information as well as its regular updating is assured;

(b) Target-oriented and custom-made training, particularly on control technologies, including their material and energy input and operating conditions is considered as an effective tool for promoting the exchange of technology;

(c) Parties' developing their own domestic capacities to design, manufacture and operate control technologies/techniques in countries with economies in transition is crucial and merits well-focused international assistance;

(d) Forums bringing together environmental administration/agencies, industrial and business community and research institutions have a role to play in technology exchange;

(e) Following an integrated approach in domestic policy can be a driving force for developing new control technologies, avoiding to a greater extent transfer problems between the pollutants and the environmental media;

(f) Harmonization of environmental standards (limit values for emissions and technology performance/BAT as included in the Convention's Protocols) and their effective enforcement can facilitate technology cooperation and prevent the recipient countries from becoming "pollution havens";

(g) Infrastructure to receive foreign assistance, e.g. financial institutions, including banking systems and financial markets, is sufficiently well developed in countries with economies in transition to absorb this assistance;

(h) There is a need for technical and financial support for Central and Eastern European countries in creating networks for information exchange on new technologies and developing their own capacities to receive control technologies/techniques;

(i) International economic instruments, e.g. emission trading, joint implementation and burden sharing, have a significant role to play in exchanging control technologies/techniques;

(j) Technical annexes to the protocols include a considerable number of effective techniques to reduce NOx and SOx. These techniques are available and should be used when reducing or controlling NOx and SOx emissions.