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**United Nations
Environment
Programme**

**Intergovernmental negotiating committee
to prepare a global legally binding
instrument on mercury**

First session

Stockholm, 7–11 June 2010

Item 4 of the provisional agenda*

**Preparation of a global legally binding
instrument on mercury**

**Progress in the preparation of the study called for in
paragraph 29 of Governing Council decision 25/5**

Note by the secretariat

Introduction

1. By paragraph 29 of its decision 25/5, the Governing Council of the United Nations Environment Programme (UNEP) requested the Executive Director of UNEP, for the purposes of informing the work of the intergovernmental negotiating committee, to conduct a study, in consultation with the countries concerned, on various types of mercury-emitting sources, as well as current and future trends of mercury emissions, with a view to analysing and assessing the cost and the effectiveness of alternative control strategies and measures.
2. A draft outline of the study called for in paragraph 29 was presented to the ad hoc open-ended working group to prepare for the intergovernmental negotiating committee at its meeting held in Bangkok from 19 to 23 October 2009. At that meeting many representatives stressed the importance of having the study ready for the committee's second session and requested that a progress report on the study should be provided for information at the committee's first session to enable early discussion of risk management and reduction. The present note responds to that request.
3. The study will be based on previous reports on global mercury emissions and emissions control options prepared for UNEP in 2008 and will focus on the main emitting sectors in selected countries. Additional information on emissions, technical source characterization and current and future plans for emissions control will be collected from the selected countries through a questionnaire to be distributed to UNEP contact points and through assessments by international and local experts. The study is

* UNEP(DTIE)/Hg/INC.1/1.

expected to result in a set of scenarios in which ranges of control costs and likely emissions reductions will be presented for the selected countries and sectors. The results from the selected countries will then be extrapolated to provide an overview of total costs for various emissions reduction scenarios on a global scale.

I. Objectives and purpose of the study

4. The purpose of the study is to inform the work of the intergovernmental negotiating committee by providing information relevant to the development of measures for controlling mercury emissions that could be featured in the legally binding instrument that is to be elaborated.

5. The main objectives of the study are:

(a) To present updated and new information on mercury emissions for selected countries and sectors and current trends in mercury emissions;

(b) To provide an overview of the technical characteristics of the main sources of mercury emissions in the selected countries and sectors;

(c) To provide an overview of current and planned initiatives and measures at the national, regional and global levels and how they might affect future mercury emissions. This includes initiatives directed specifically to mercury pollution, air pollution and carbon dioxide abatement;

(d) To provide quantitative information on the effectiveness and cost of representative abatement measures in the selected sectors.

II. Scope

6. The study will focus on the main emitting sectors identified in previous UNEP emissions reports in respect of which information on the cost and effectiveness of alternative control technologies and measures may be available for consideration by the committee. These sectors include coal-fired power plants and industrial boilers; industrial metal production facilities (with a focus on non-ferrous smelters, particularly for lead, zinc, copper and gold); waste incineration facilities; and cement production factories.

7. The study will focus on information from countries that, based on previous assessments, are considered likely to be significant contributors to global mercury emissions in each source category. The countries featured in the study are Brazil, China, India, the Russian Federation, South Africa, the United States of America and the 27 member countries of the European Union. The results will be extrapolated to provide global estimates and presented in the form of a series of different mercury control scenarios providing a range of emissions reductions at various estimated implementation costs.

8. Time permitting, the cost and effectiveness of abatement measures in other sectors will be analysed if suitable information is available in relevant formats from relevant partnerships or industry associations.

III. Progress since the working group meeting

9. Since the meeting of the ad hoc open-ended working group to prepare for the intergovernmental negotiating committee on mercury in October 2009, the secretariat has collated existing publicly available information and prepared a draft of the study, which it refers to as the “zero draft”, compatible with the draft outline presented at the meeting of the working group. The secretariat has also invited all countries to submit information for the study by 15 April 2010. Questionnaires and electronic spreadsheets to assist in the submission of information on the selected sectors were attached to the letters. The letters, questionnaires, electronic spreadsheets and the zero draft of the study have been posted on the UNEP mercury programme website at http://www.chem.unep.ch/mercury/Paragraph29/Paragraph29_study.htm.

10. The zero draft of the study provides a compilation of publicly available knowledge on mercury emissions to air; an overview of future scenarios for mercury emissions and initial assumptions to be used in preparing scenarios; a brief description of the sectors selected for the study; a description of how mercury enters various processes and where and how it is released to air; and information on control options and their associated costs.

11. The greater part of the information currently included on global mercury emissions and the qualitative assessment of the costs and efficiencies of control options is taken from reports prepared for UNEP in 2008. That information is complemented by more recent information on emissions, control options and costs taken from publicly available literature.

12. The zero draft is not intended as a direct input for the intergovernmental negotiating committee. It is intended rather to give an indication of the status of information currently available on the issues to be covered by the study. It is also meant to serve as a guide, for those countries intending to submit information for the study, on the type of information needed, how such information is to be used in the study, how it can help in the preparation of a more robust study and how it might facilitate the development of more realistic scenarios that take into account uncertainties in efficiencies and costs of control options.

13. In the questionnaires distributed by the secretariat, countries were invited to report on technical details in respect of the selected sectors, either as country averages or on an individual plant basis. Countries were also asked for information on strategies and plans for the implementation of control measures for air pollutants and for the restructuring and modernization of the selected sectors.

IV. Plans for the finalization of the paragraph 29 study

14. The information gathered by UNEP and submitted by countries will be compiled in the final draft of the study to be presented to the committee at its second session.

15. The procedure for finalizing the scenarios to be discussed in the final draft is presented schematically in the figure below. The figure depicts how the information submitted by countries will be employed to derive the scenarios. The stepwise procedure for the preparation of the scenarios required for the final draft of the study is summarized below.

16. Data on emissions and technical descriptions of the selected sectors in those countries providing information will be used to improve existing emissions inventories. If actual emissions data are not available, emissions estimates will be derived in consultation with national experts, using available activity data and emissions factors, available information on the mercury content of fuels and raw materials and available information on installed air pollution control.

17. National plans for the development of the relevant sectors will be assessed with regard to their future impact on mercury air emissions. Planned restructuring and modernization of the sectors, predicted development (growth or reduction of output) of the sectors to meet future demand and plans for additional air pollution control will be used to develop a reference scenario of mercury air emissions from the sectors based on currently available information (current predictions).

18. Potential additional applicable control strategies for reducing mercury air emissions will be selected based on the information obtained in the previous steps. Such control strategies will, wherever possible, include both specific measures to control mercury emissions and measures directed more broadly at other air pollution controls that have a positive influence on mercury air emissions (known as "co-benefit controls"). Two or three future scenarios for mercury air emissions with different assumed ambition levels for mercury control will be developed. These scenarios will replace those presented in the zero draft.

19. Based on the potential additional applicable control strategies for reducing mercury emissions derived in the step above, the likely costs associated with these measures will be estimated to prepare the future scenarios. The allocation of costs between control measures primarily intended for the control of other air pollutants and mercury-specific measures will also be discussed, along with uncertainties in the estimates.

20. The final step in the development of the final draft and the use of the scenarios is to extrapolate the results from the selected countries to the global scale. This will be done by combining national information with regional information on economic growth, the status of the selected sectors and other parameters.

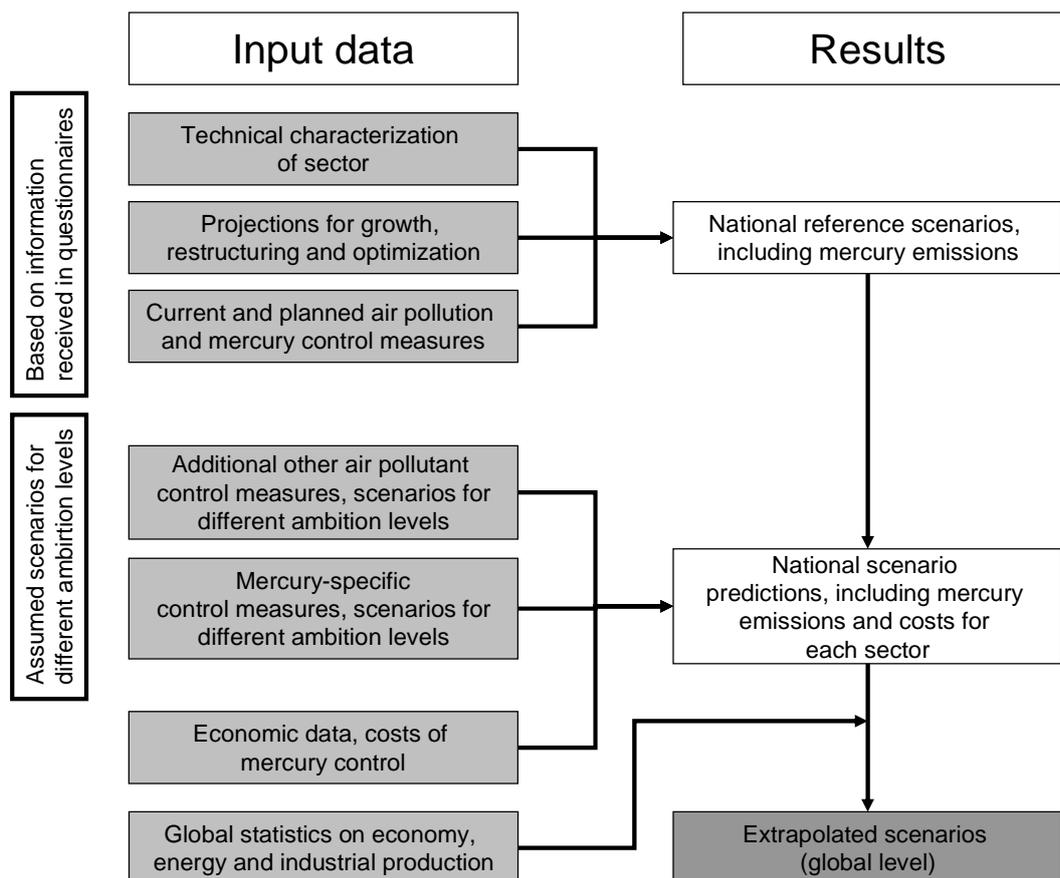


Figure. Schematic description of procedure for deriving scenarios for mercury emissions to air

21. The annex to the present note sets out an annotated table of contents for the study. It consists of a table of contents on the first page showing the study's main chapter and section headings; this is followed by the headings themselves, arranged as they will be in the final study, down to the level of subsections. Under some headings the committee will find discussion of what the corresponding chapters, sections and subsections will contain. It should be noted, however, that such discussion is not provided for all headings, but rather only for those on which the authors wished in particular to provide further amplification.

Annex

Study on mercury-emitting sources, including cost and effectiveness of alternative control measures (paragraph 29 study): annotated table of contents

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Introduction

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Technical annexes

Introduction

A. Background, scope and mandate

1. This section will describe the mandate for the study, as set out in UNEP Governing Council decision 25/5, and the scope of the study.

B. Sources of information

2. The study will use all available relevant information, including in particular information submitted by countries and institutions in response to the request by UNEP for information. Some specific sources may be mentioned here:

(a) Global Atmospheric Mercury Assessment: Sources, Emissions and Transport (summary report) and the Technical Background Report to the Global Atmospheric Mercury Assessment prepared by UNEP and the Arctic Monitoring and Assessment Programme);

(b) General qualitative assessment of the potential costs and benefits associated with each strategic objective set out in annex I to the report of the first meeting of the Open-ended Working Group on Mercury (UNEP(DTIE)/Hg/OEWG.1/6);

(c) Results of European Union projects such as those on an integrated assessment of heavy metal releases in Europe¹ and on a health and environment integrated methodology and toolbox for scenario assessment;

(d) Study being undertaken by UNEP and the coal combustion partnership area on reducing mercury emissions from coal combustion in the energy sector (funded by the European Commission).

I. Global emissions of mercury and future scenarios

3. This chapter will provide an overview of global anthropogenic emissions of mercury, both as total emissions and from the selected sectors and geographical regions.

4. New information provided by the selected countries through the questionnaires will permit improved estimates of emissions from the selected sectors, which will be used as a basis for the development of scenarios for emissions, emissions controls and costs, which will be extrapolated to the global level.

A. Global anthropogenic mercury emissions to air

B. Trends in global mercury emissions to air

1. Emissions by geographical region

C. Scenarios for global mercury emissions to air

5. This section will provide an overview of procedures for deriving scenarios of mercury control and resulting emissions on a global scale. It will present scenarios derived using the procedures described, based on information from the selected countries, including improved information on the status of the selected sectors, plans for air pollution control (important in relation to co-benefits for mercury control), plans for mercury emissions control and other factors.

6. A reference mercury-air-emissions scenario for the selected sectors will be developed based on current predictions or plans on restructuring and modernization of the sectors, predicted development (growth or reduction of output) of the sectors to meet future demand and plans for additional air pollution controls. Two or three air-emissions scenarios assuming various ambition levels for mercury control will also be developed and the likely associated costs estimated for each. Allocation of costs

¹ The objective of the project on an integrated assessment of heavy metal releases in Europe was to develop methods and to identify strategies for supporting European Union environmental policymaking aimed at reducing emissions and harmful effects of heavy metals. The core aim of the research carried out under the project was to assess long-term damage to the environment and human health. The project covered the priority metals mercury, cadmium, lead, nickel, arsenic and chromium.

between control measures primarily intended for other air pollutant control and mercury-specific measures will also be discussed, along with uncertainties in the estimates. The results will be extrapolated to develop global scenarios.

1. **Basic principles**
2. **Scenario descriptions**

II. Emissions control, efficiencies and costs

7. This chapter will provide a general overview of available technologies for reducing mercury emissions in the selected sectors and their associated efficiencies and costs, along with a general discussion of the cost calculations.

8. The chapter will include a discussion of control measures for other pollutants that offer co-benefits in respect of mercury control. In many cases, what is known as “co-control” of mercury and other air pollutant emissions is achieved when employing air emission control technologies used to reduce emissions of other pollutants.

A. Emissions control

1. **General primary control measures**
2. **Technical co-control of air pollutants and mercury**

B. Combining different control technologies for optimized mercury control

9. This section will aim to evaluate which control technologies or which combination of control technologies are relevant and feasible for each sector. New information from countries will be necessary for this evaluation.

C. Cost and efficiencies of mercury control

10. This section will discuss the cost and efficiencies associated with various means of mercury control. It is important to note, however, that currently available information on the cost of mercury control comes largely from studies in Europe and North America. Without new information on the current technical status of the selected sectors and current and planned air pollution controls in other countries, a detailed estimate of the cost of mercury control cannot be made.

III. Characterization of the selected sectors

11. This chapter will provide a technical description and information about mercury emissions to air, control measures and associated costs for the selected sectors:

- (a) Coal combustion in power plants and industrial boilers;
- (b) Non-ferrous metal production;
- (c) Cement production;
- (d) Waste incineration.

12. For each sector the report will:

- (a) Describe how mercury enters processes and how it is released;
- (b) Describe briefly the various technologies used in the sector;
- (c) Describe the various options for control measures, including the co-benefits from other pollutant control measures;
- (d) Describe the potential cost and efficiencies of various control measures and technologies.

13. The information currently available on control measures and the cost of such measures in the different sectors varies considerably. For example, there is significantly more information on the coal sector than on other sectors. Most information currently available is from the United States and Europe, and the relevance of this information to other areas is not evident. New information from countries elsewhere is necessary to present information of global value for all sectors.

A. Coal combustion in power plants and industrial boilers

1. **Origin of mercury and emissions from coal combustion**
2. **Technologies for coal combustion**
3. **Control measures in coal combustion**
 - (a) **Pre-treatment of coal**
 - (b) **Improved operating procedures**
 - (c) **Co-control of mercury in coal combustion facilities**
 - (d) **Technical mercury specific control in coal combustion facilities**
4. **Costs and efficiencies of control technologies for coal-fired power plants**

B. Non-ferrous metals production

1. **Origin of mercury and emissions from non-ferrous metals production**
2. **Technologies for non-ferrous metals production**
3. **Control measures in non-ferrous metals production**
4. **Costs and efficiencies of control technologies for non-ferrous metals production**

C. Cement production

1. **Origin of mercury and emissions from cement production**
2. **Control measures in cement production**
3. **Costs and efficiencies of control technologies for cement production**

D. Waste incineration

1. **Origin of mercury and emissions from waste incineration**
2. **Technologies for municipal solid waste incineration**
3. **Control measures in waste incineration**
4. **Costs and efficiencies of control technologies for waste incineration**

IV. Summary and conclusions

14. This section will present the summary and conclusions of the study.

References

Technical annexes
