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Ad Hoc Open-ended Working Group on Mercury

Second meeting

Nairobi, Kenya

6–10 October 2008

Item 3 of the provisional agenda*

**Review and assessment of options for enhanced voluntary measures
and new or existing international legal instruments**

**Report presenting the costs and benefits for each of the strategic
objectives**

Note by the secretariat

1. The Governing Council of the United Nations Environment Programme, in its decision 24/3 IV on chemicals management, established an ad hoc open-ended working group of Governments, regional economic integration organizations and stakeholder representatives to review and assess options for enhanced voluntary measures and new or existing international legal instruments for addressing the global challenges presented by mercury.
2. At its first meeting, the Ad Hoc Open-ended Working Group on Mercury requested the secretariat to undertake intersessional work in a number of areas in preparation for its second meeting.
3. The report provides a general qualitative assessment of potential costs and benefits for each of the strategic objectives (classifying them as small, medium, large or not applicable). The assessment takes into account that the cost element is based on the overall costs associated with implementing each strategic objective, while the benefit element is based on the extent to which the strategy would reduce mercury-related risks on a global basis and distinguish between local and global risk-reduction benefits.
4. The secretariat was also requested to gather and present any available information on the social and economic costs of maintaining the status quo.
5. The secretariat requested information from Governments, intergovernmental organizations and non-governmental organizations. Information submitted has been made available on the website of the mercury programme (<http://www.chem.unep.ch/mercury>) and has been used in the preparation of the assessment. The work has also been built, where possible, on work undertaken for other forums that is directly relevant to this context.

* UNEP(DTIE)/Hg/OEWG.2/1.

6. The report comprises an executive summary and a detailed discussion. For ease of reference, the executive summary has been reproduced in the annex to the present note. The full report, including both the executive summary and the detailed discussion, will be presented as an addendum to the present note under the symbol UNEP(DTIE)/Hg/OEWG.2/5/Add.1. Both the executive summary and the full report are being circulated as submitted and have not been formally edited.

Suggested action

7. The Ad Hoc Open-ended Working Group on Mercury may wish to draw on the report in considering the need for and relative priority of individual measures for inclusion within the options to be forwarded to the Governing Council.

UNEP Report

on

A general qualitative assessment of the potential costs and benefits associated with each of the strategic objectives set out in Annex 1 of the report of the first meeting of the Open Ended Working Group

June 30, 2008

Executive Summary

Mercury is an important environmental contaminant. This contaminant is toxic, persistent, and long-lived in the atmosphere, and can be transported globally. International action is required to reduce environmental and health risks at local, regional, and global scale.

A new assessment of the emissions of mercury is underway. A draft version of the UNEP report on emissions will be available as a draft at the second meeting of the ad hoc open-ended working group. Information from the UNEP emissions report has been used in the preparation of this report on cost benefit analyses.

This report presents a qualitative assessment of potential costs and benefits associated with each of the strategic objectives set out in Annex 1 of the report of the first meeting of the Open Ended Working Group (OEWG 1) that met in Bangkok 12-16 November 2007.

Costs have been assessed as including the economic costs of introducing the necessary equipment or actions to obtain the mercury reduction. Costs are defined as being small, medium and large, based on the highest cost of abatement for a given strategy (emission category).

Benefits of reducing mercury emissions include social, economic, ecological and human health benefits. For ingested mercury, the benefits are estimated to be \$12,500 USD per kg of mercury¹. For inhaled mercury, the benefits are between \$1.34 and \$1.22 per kg of mercury.

In conducting the cost-benefit analysis, the benefits are assessed on the basis of the impact of the reduction of mercury releases, and are then related to costs. Statements regarding the benefits of activities are based on the assumption that the benefits are large if they exceed the costs by at least a factor of 2. If the benefits are equal or lower than costs, then it was assumed that the benefits are small. Medium benefits are between the large and small benefits.

While all strategic objectives specified have been assessed, assessment in detail was possible only where information was available. In particular, the costs and benefits of reducing emissions from coal burning have been addressed in some detail in this report.

In assessing ways to reduce anthropogenic mercury emissions, technological and non-technological measures have been assessed. A number of technological measures are available for reducing mercury emissions from anthropogenic sources where mercury is a by-product (e.g. power plants, smelters, cement kilns, other industrial plants), waste disposal and other uses. These measures differ with regard to emission control efficiency, costs, and environmental benefits obtained through their implementation. Very often mercury emissions are substantially reduced by equipment employed to reduce emissions of other pollutants. The best example is the reduction of mercury emissions achieved through the application of desulfurization measures.

The analysis also took account of the range of efficient, non-technological measures and pre-treatment methods are also available for the reduction of mercury releases from various uses of products containing mercury. These measures include ban on use and substitution of products containing mercury, and cleaning of raw materials before their use (e.g. coal cleaning). These measures also include energy conservation options, such as energy taxes, consumer information, energy management and improvement of efficiency of energy production through a co-generation of electricity and heat in coal-fired power plants.

¹ A conversion figure of 1 USD = 0.64 € has been used throughout this report.

The costs of reducing mercury emissions in this report are linked to the economic costs of introducing the necessary equipment or introducing other necessary actions to obtain the reduction. These costs include the investment costs and operational and maintenance costs.

A summary of the costs and benefits for each of the strategic objectives are presented in Table 1 below.

Table 1: Costs and benefits of Hg emission reduction for various reduction options

Reduction option	Costs	Benefits
1 Reduction from coal usage	Medium → Large	Large
2 Artisanal and small – scale gold mining	Small → Large	Small → Large
3 Reduction of Hg trade emissions	Small → Large	Small → Large
4 Reduction from industrial processes	Medium → Large	Medium → Large
5 Reduction of waste generation	Small → Large	Large
6 Promotion of Hg waste collection and treatment	Small → Medium	Large
7 Reduction from waste disposal	Medium → Large	Large
8 Reduction of Hg consumption in VCM and chlor-alkali production	Small → Large	Medium → Large
9 Reduction of Hg use in products	Small → Large	Small
10 Reduction from dental practice	Small → Large	Medium
11 Reduction of supply from mining and extraction	Small → Medium	Large
12 Reduction of supply from decommissioned cells and stockpiles	Small → Large	Large
13 Prevention of contamination from spreading	Large	Medium → Large
14 Control and remediation of contaminated sites	Small → Medium	Large
15 Increase of knowledge among states	Small → Large	Large
16 Increase of knowledge among users and consumers	Small	Large

It can be seen from this table that costs and benefits vary significantly between strategic objectives.

The final conclusion of the reported work is that there are benefits to investment in reducing mercury emissions and exposure in the future primarily for the sake of improvement of human health and more generally human welfare. Measures with the application of technology, such as implementation of installations to remove mercury from the flue gases in electric power plants, waste incinerators, and smelters are rather expensive (medium to large costs) compared to non-technological measures, such as prevention activity, capacity building, and promotion of mercury-containing waste separation (small to medium costs). Both groups of measures would result in large benefits, and parallel application of these, depending on resources would be appropriate.