

Technical Background Report for the Global Mercury Assessment 2013





AMAP

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Preface

This report details the technical background to the *Global Mercury Assessment 2013 – Sources, Emissions, Releases and Environmental Transport* (summary for policy-makers) that has been developed in response to Decision 25/5 III, paragraph 36 of the Governing Council of the United Nations Environment Programme (UNEP), that: “Request the Executive Director, in consultation with Governments, to update the 2008 report entitled “*Global Atmospheric Mercury Assessment: Sources, Emissions and Transport*” for consideration by the Governing Council / Global Ministerial Environment Forum at its twenty-seventh session.”

This technical background report has been developed in collaboration with the Arctic Monitoring and Assessment Programme (AMAP). As such, this report also constitutes a contribution to the work of AMAP and the Arctic Council.

Chapter 2 of this report (*Global Emissions of Mercury to the Atmosphere*) was developed by a joint UNEP/AMAP Expert Group, building on the competence established during the AMAP/UNEP collaboration that resulted in the 2008 *Technical Background Report to the Global Atmospheric Mercury Assessment: Sources, Emissions and Transport* report (UNEP, 2008). In producing this part of the report, considerable efforts were made to engage a wide participation of national experts from regions around the globe. Thanks to funding provided by Canada, Denmark, Japan, Sweden, Norway, the Nordic Council of Ministers, and the EU, experts from Argentina, Australia, Brazil, China, India, Japan, Mexico, Republic of Korea, South Africa and the USA actively participated in the work to develop Chapter 2 of this report. Expertise and information made available through the UNEP Partnership area on Mercury Control from Coal Combustion Information was used, as were data acquired during the preparation of the UNEP Paragraph 29 study (*Study on Mercury Sources and Emissions, and Analysis of Cost and Effectiveness of Control Measures*, UNEP 2010a). The sections concerning artisanal and small-scale gold mining were developed through cooperation with experts from the UNEP Partnership on Reducing Mercury in Artisanal and Small-scale Gold Mining and from the Artisanal Gold Council (AGC).

Chapter 3 of this report (Atmospheric Pathways, Transport and Fate) was prepared by experts from the UNEP Mercury Air Transport and Fate Research Partnership Area.

Chapter 4 of this report (Global Releases of Mercury to Aquatic Environments) was prepared by a UNEP/AMAP expert group under the leadership of experts from the Institute Jožef Stefan (Slovenia) and utilised material prepared for UNEP by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP).

Chapter 5 of this report (Aquatic Pathways, Transport and Fate) was prepared by a UNEP/AMAP expert group under the

leadership of experts from the Geological Survey of Canada and the University of Connecticut and contributions from Institute Jožef Stefan (Slovenia). The input of John Munthe to this work is also greatly appreciated.

1. Introduction

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1.1 Background and mandate

In 2009, UNEP's Governing Council (GC) requested that "UNEP in consultation with Governments, update the 2008 report entitled *Global Atmospheric Mercury Assessment: Sources, Emissions and Transport* for consideration by the Governing Council/Global Ministerial Environment Forum at its twenty-seventh session in 2013". (Decision 25/5 III, paragraph 36).

Building on the 2008 report, the new report entitled *Global Mercury Assessment 2013 - Sources, Emissions, Releases and Environmental Transport* should provide updated:

- (a) Best available data on mercury atmospheric emissions and trends including where possible an analysis by country, region and sector, including a consideration of factors driving such trends and applicable regulatory mechanisms; and
- (b) Current results from modelling on a global scale and from other information sources on the contribution of regional emissions to deposition which may result in adverse effects and the potential benefits from reducing such emissions, taking into account the efforts of the Fate and Transport partnership established under the United Nations Environment Programme mercury programme.

The main focus of the updated report is on mercury (Hg) emissions to the air and pathways and fate of atmospheric Hg. However, in response to questions raised by several

governments in the Intergovernmental Negotiating Committee (INC) developing a global instrument on Hg to include releases to water, the content of the updated report has been expanded to include information on Hg releases to water and pathways and fate in aquatic environments.

This report (*Technical Background Report for the Global Mercury Assessment 2013*) provides the detailed technical background for the information and findings that are presented in the *Global Mercury Assessment 2013 - Sources, Emissions, Releases and Environmental Transport* summary report. It consists of five parts:

Chapter 1 – Introduction

Chapter 2 – Global Emissions of Mercury to the Atmosphere

Chapter 3 – Atmospheric Pathways, Transport and Fate

Chapter 4 – Global Releases of Mercury to Aquatic Environments

Chapter 5 – Aquatic Pathways, Transport and Fate

As described above, this report deals with Hg releases to the atmosphere and water, and the pathways and fate of Hg after it has entered the atmosphere and aquatic environments. Figure 1.1 illustrates these components, showing which parts of the global Hg cycle are considered in the various chapters of this report – Figure 1.1 can therefore be viewed as a 'road map' for the report. Figure 1.2, using the same basic diagram shows, in quantitative terms, the main features of the global Hg cycle, including numerical estimates for the Hg 'storage' and flux components that are described in more detail in the following chapters.



Figure 1.1. Components of the global mercury cycle as addressed in this report. Numbers refer to the chapters of this report.

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