

Ministry of Environment and the Protection of
the Nature (MINEP)

INVENTORY OF MERCURY RELEASES IN CAMEROON

By Gilbert KUEPOUO, PhD (**CREPD**)

In collaboration with

Mr. Enoh Peter AYUCK (**MINEP**)

Mr. Lemnyuy Albun William BANYE (**MINEP**)

November 2011

INVENTORY OF MERCURY RELEASES IN CAMEROON

Contact point responsible for this inventory	
Full name of institution	MINISTRY OF ENVIRONMENT AND THE PROTECTION OF THE NATURE (MINEP)
Contact person	Mr. Enoh Peter AYUCK
E-mail address	enohpeter@yahoo.fr
Telephone number	(+237) 22221106
Fax number	(+237) 22221106
Website of institution	
Report issuing date	November 19 th , 2011

Table of Contents

1	Executive summary	3
2	Mercury release source types present	7
3	Summary of mercury inputs to society	10
4	Summary of mercury releases	13
5	Data and inventory on energy consumption and fuel production	18
5.1	Data description	18
5.2	Background calculations and approximations	19
5.3	Gaps and priorities for potential follow up	19
6	Data and inventory on domestic production of metals and raw materials	20
6.1	Data description	20
6.2	Background calculations and approximations	20
6.3	Gaps and priorities for potential follow up	20
7	Data and inventory on domestic production and processing with intentional mercury use	21
7.1	Data description	21
7.2	Background calculations and approximations	21
7.3	Data gaps and priorities for potential follow up	21
8	Data and inventory on waste handling and recycling	22
8.1	Data description	22
8.2	Background calculations and approximations	22

9	Data and inventory on general consumption of mercury in products. as metal mercury and as mercury containing substances	23
9.1	Data description	23
9.2	Background calculations and approximations	25
9.3	Data gaps and priorities for potential follow up	26
10	Data and inventory on crematoria and cemeteries	27
10.1	Data description	27
10.2	Background calculations and approximations	27
10.3	Data gaps and priorities for potential follow up	27
11	List of major data gaps	28
	References	29
	Appendix 1 - Inventory Level 1 calculation spreadsheets	32

1 Executive summary

The general objective of this work is to perform the preliminary inventory of mercury in Cameroon in order to protect human health and the environment.

To fulfill this general objective, the following activities were carried out based mostly on documentation existing (Dioxins and Furans Inventory Report, 2011; *Impact of medical mercury-thermometers consumption on the mercury “hot spots” development in a setting lacking sound disposal capacities: Case of the healthcare sector in Cameroon*: Draft paper by KUEPOUO Gilbert in CREPD; UN ComTrade database, and INS).

We then identified the main sources of mercury emission and release in Cameroon and then use the default values set in the “Toolkit for Identification and Quantification of Mercury Releases,” to calculate the releases from these sources based on detailed quantitative information on the sources identified obtained from the documentation sources.

This mercury release inventory was made with the use of the "Toolkit for identification and quantification of mercury releases" made available by the United Nations Environment Programme's Chemicals division (UNEP Chemicals). The Toolkit is available at UNEP Chemicals' website:

<http://www.unep.org/hazardoussubstances/Mercury/MercuryPublications/GuidanceTrainingMaterialToolkits/MercuryToolkit/tabid/4566/language/en-US/Default.aspx>.

This inventory was developed on the Toolkits Inventory Level 1. The Toolkit is based on mass balances for each mercury release source type. Inventory Level 1 works with pre-determined factors used in the calculation of mercury inputs to society and releases. The so-called default input factors and default output distribution factors. These factors were derived from data on mercury inputs and releases from such mercury source types from available literature and other relevant data sources.

In the context of this work, the following sources categories were screened in the Cameroon context regarding the mercury issue.

1. Coal combustion and other coal use
2. Other fossil fuel and biomass combustion
3. Oil and gas production
4. Gold production with mercury amalgamation
5. Primary metal production
6. Other material production
7. Chlor-alkali production with mercury-cells

8. Other production of chemicals and polymers
9. Production of products with mercury content
10. Use and disposal of dental amalgam fillings
11. Use and disposal of other products
12. Production of recycled metals
13. Waste incineration and open waste burning
14. Waste deposition
15. Informal dumping of general waste
16. Waste water system/ treatment
17. Crematoria and cemeteries

The first stage in applying the Toolkit was to preparing a rough selection matrix to identify the principal mercury source categories in Cameroon. In the second stage subcategories and additional qualitative information were added for the purpose of identifying specific activities and sources of mercury release present in the country.

It is important to highlight that among the above 17 sources, there were no activities identified as mercury emission sources for the following source categories: Coal combustion and other coal use; gold production with mercury amalgamation; other production of chemicals and polymers; production of products with mercury content; and production of recycled metals.

Chlor-alkali production with mercury-cells is not yet established in the context of Cameroon.

Emissions to various media were estimated using the electronic spreadsheets for calculation of estimates of mercury inputs and releases based on the default input factors recommended in the Toolkit for identification and quantification of mercury releases. Preliminary estimates indicate that kg of Hg mercury releases in Cameroon per year in various media is as follows: air (3540 kg Hg/year); water (19 960 kg Hg/year); land (1140 kg Hg/year); by-products and impurities (170 kg Hg/year); general waste (25 560 kg Hg/year); and sector specific waste treatment/disposal (990 kg Hg/year).

Based on the estimated results, the largest source of mercury release in the country corresponds to the category “Use and disposal of other products”. This is due to the general waste management system in Cameroon, specifically to the uncontrolled burning and dumping the municipal and medical wastes.

Comparative analysis of the results obtained, based on the input factors applied (low end and high end), indicates that five of the ten categories studied show the highest mercury releases. The increment in general deposits is attributed to mercury-containing waste products such as batteries, thermometers, lamps and other items that are not treated before disposal.

In regard to air releases, at the national level the source with the highest releases are “Informal dumping of general waste” and “Waste incineration and open waste burning”.

Introduction

Inventory for anthropogenic releases of mercury constitutes an important decision making tool in the process of mitigating environmental impacts from this highly toxic substance in Cameroon. Estimate of both the relative and the absolute contributions to mercury releases from the different sources present in the country is needed. This information can be used to determine which release

source types are significant and which sources should be addressed through release reduction initiatives.

Mercury inventory results combined with additional knowledge play a role in identifying the most cost-effective reduction measures for decision making. Often, such inventories are also vital in the communication with stakeholders such as industry, trade and the public.

Furthermore, baseline inventories, and subsequent up-dates, can be used to set goals, priorities and monitor progress.

The present inventory carried out in November 2011, was based primarily on data collected for dioxins and furans inventory within the framework of national implementation plan of the Stockholm Convention using 2009 as reference year. Other information sources used are the UNComTrade database and relevant ministries and institutions.

Compilation of results and subsequent discussions are given in the following paragraphs.

Results and discussion

An aggregated presentation of the results for main groups of mercury release sources is presented in Table 1.1 below.

Table 1-1 Summary of mercury inventory results

Source category	Estimated Hg input. Kg Hg/y	Estimated Hg releases, standard estimates, Kg Hg/y					
		Air	Water	Land	By-products and impurities	General waste	Sector specific waste treatment /disposal
Coal combustion and other coal use	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other fossil fuel and biomass combustion	59.1	59.1	0.0	0.0	0.0	0.0	0.0
Oil and gas production	318.8	21.9	47.1	0.0	0.0	13.1	0.0
Primary metal production (excl. gold production by amalgamation)	96.4	14.4	9.6	0.1	0.0	62.6	9.6
Gold extraction with mercury amalgamation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other materials production	338.0	202.8	0.0	0.0	67.6	67.6	0.0
Chlor-alkali production with mercury-cells	-	-	-	-	-	-	-
Other production of chemicals and polymers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Production of products with mercury content	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Use and disposal of dental amalgam fillings	2 910.0	58.2	966.1	0.0	104.8	558.7	558.7
Use and disposal of other products	44 191.2	520.5	17 353.6	1 129.6	0.0	24 857.8	329.8
Production of recycled metals	1.3	0.4	0.0	0.4	0.0	0.4	0.0
Waste incineration and open waste burning	1 152.5	1 065.6	0.0	0.0	0.0	0.0	86.9
Waste deposition and waste water treatment	1 890.0	18.9	0.2	0.0	-	-	-
Informal dumping of general waste *1	15 812.5	1 581.3	1 581.3	12 650.0	-	-	-

Waste water system/treatment	18.0	0.0	16.2	0.0	0.0	1.8	0.0
Crematoria and cemeteries	10.1	0.0	0.0	10.1	0.0	0.0	0.0
TOTALS	49 810.0	3 540.0	19 960.0	1 140.0	170.0	25 560.0	990.0

Note *1: The estimated quantities include mercury in products which has also been accounted for under each product category. To avoid double counting these quantities have been subtracted automatically in the TOTALS.

Keeping in mind the principles for common but differentiated responsibility, waste disposal including the life cycle management of products containing mercury and its compounds; and cement production are the main source of mercury concern in the Cameroon context.

For more detail as shown in the table 1-1 above, the following source groups contribute with the major mercury inputs:

- 1- Use and disposal of other products (44 191.2 kg Hg/y)
- 2- Informal dumping of general waste (15812.5 kg Hg/y)
- 3- Use and disposal of dental amalgam fillings (2910 kg Hg/y)
- 4- Waste deposition and waste water treatment (1890 kg Hg/y)
- 5- Waste incineration and open waste burning (1152 kg Hg/y)

The individual mercury release sub-categories contributing with the highest mercury inputs were “Use and disposal of other products” and “Informal dumping of general waste”.

The individual mercury release sub-categories contributing with the highest mercury releases to the atmosphere were “Informal dumping of general waste” and “Waste incineration and open waste burning”.

Detailed presentation of mercury inputs and releases for all mercury release source types present in the country are shown in the following report sections.

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_15749

