

ENVIRONMENTAL PROTECTION  
AUTHORITY

**INVENTORY OF MERCURY  
RELEASES IN ETHIOPIA**

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## INVENTORY OF MERCURY RELEASES IN ETHIOPIA

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<b>MERCURY INVENTORY FOR (COUNTRY NAME):</b>	<b>ETHIOPIA</b>
<b>General population data</b>	
Population (number of inhabitants)	80,000,000 with growth rate of 2.6 %
Year and reference for population data	2007,CENTAL STATSTICS OFFICE OF ETHIOPIA
GDP (Gross Domestic product)	351 USD
Year and reference for GDP data	2011, IMF
Main sectors in the economy of country (list)	Agriculture,Industry
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## **1 Executive summary**

### **Introduction**

This inventory is made by the Environmental Protection Authority of Ethiopia in collaborations with the Ministry of Mines, Ministry of Water and Energy, Ministry of Construction and Urban Development, Ministry of Industry and Ministry of Health with the financial support of the UNEP- Chemicals in the year 2012.

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/GuidanceTrainingMaterial/Toolkits/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.

## 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	7,169.6	6,452.6	0.0	0.0	0.0	717.0	0.0
Other fossil fuel and biomass combustion	403.9	403.9	0.0	0.0	0.0	0.0	0.0
Oil and gas production	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Primary metal production (excl. gold production by amalgamation)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gold extraction with mercury amalgamation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other materials production	3,729.0	2,237.4	0.0	0.0	745.8	745.8	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	12,000.0	240.0	3,984.0	0.0	432.0	2,304.0	2,304.0

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dental amalgam fillings							
Use and disposal of other products	15,200.0	3,360.0	1,320.0	4,480.0	0.0	4,680.0	1,360.0
Production of recycled metals	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste incineration and open waste burning*1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste deposition*1	-	-	-	-	-	-	-
Informal dumping of general waste *1*2	0.0	0.0	0.0	0.0	-	-	-
Waste water system/treatment *3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crematoria and cemeteries	2,097.6	0.0	0.0	2,097.6	0.0	0.0	0.0
<b>TOTALS</b>	<b>40,600.0</b>	<b>12,690.0</b>	<b>5,300.0</b>	<b>6,580.0</b>	<b>1,180.0</b>	<b>8,450.0</b>	<b>3,660.0</b>

Notes:

\*1: To avoid double counting of mercury inputs from waste and products in the input TOTAL, only 10% of the mercury input to waste incineration, waste deposition and informal dumping is included in the total for mercury inputs. These 10% represent approximately the mercury input to waste from materials which were not quantified individually in Inventory Level 1 of this Toolkit.

See Appendix 1 to the Inventory Level1 Guideline for more explanation.

\*2: The estimated quantities include mercury in products which has also been accounted for under each product category.

To avoid double counting, the release to land from informal dumping of general waste has been subtracted automatically in the TOTALS.

\*3: The estimated input and release to water include mercury amounts which have also been accounted for under each source category.

To avoid double counting, input to, and release to water from, waste water system/treatment have been subtracted automatically in the TOTALS.

As shown in table 1.1, the following sources contribute with the major mercury inputs:

- Other coal uses
- Combustion/use of petroleum coke and heavy oil
- Biomass fired power and heat production
- Charcoal combustion
- Cement production
- Dental amalgam fillings ("silver" fillings)\*
- Electrical switches and relays with mercury\*
- Cemeteries

\* Note that the calculation of mercury inputs for these mercury release sources were based on default factors from the mercury Toolkit, which are derived from developed countries, and as such the inputs may be over-estimated.

The individual mercury release contributing with the highest mercury inputs were

- Energy consumption
- Other materials production
- Use and disposal of products with mercury content

The individual mercury release sub-categories contributing with the highest mercury releases to the atmosphere were:

- other coal uses
- Electrical switches and relays with mercury

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

### **Data gaps**

Major data gaps were the following:

- Incineration of municipal/general waste
- Incineration of medical waste
- Open fire waste burning (on landfills and informally)
- Informal dumping of general waste \*1
- Waste water system/treatment
- Use and disposal of products with mercury content

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