

VICE PRESIDENT'S OFFICE



INVENTORY OF MERCURY RELEASES IN TANZANIA

[January, 2012]

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1 Executive summary

1.1 Introduction

The National Mercury Inventory for the United Republic of Tanzania has been developed by the Vice President's Office – Division of Environment through multi-stakeholders task force. Member of the task force were from: The Ministry of Energy and Mineral; The National Environment Management Council; and the Government Chemist Laboratory Agency.

The inventory was prepared in January, 2012. The inventory was carried out as the first step in taking measures for sound mercury management in the country.

The 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.

1.2 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	40.5	36.5	0.0	0.0	0.0	4.1	0.0
Other fossil fuel and biomass combustion	12,061.7	12,061.7	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)	1,010,900.0	40,436.0	20,218.0	909,810.0	40,436.0	0.0	0.0
Gold extraction with mercury amalgamation	1,056.0	633.6	211.2	211.2	0.0	0.0	0.0
Other materials production	811.3	486.8	0.0	0.0	162.3	162.3	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	-	-	-	-	-	-	-
Use and disposal of other products	61.2	6.1	18.4	0.0	0.0	36.7	0.0
Production of recycled metals	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Waste incineration and open waste burning	1.3	1.2	0.0	0.0	0.0	0.0	0.1
Waste deposition and waste water treatment	-	-	-	-	-	-	-
Informal dumping of general waste	2,010.3	201.0	201.0	1,608.2	-	-	-
Waste water system/treatment	174,134.0	0.0	156,720.6	0.0	0.0	17,413.4	0.0
Crematoria and cemeteries	8,205.7	0.0	0.0	8,205.7	0.0	0.0	0.0
TOTALS	1,033,340.0	53,860.0	20,650.0	918,230.0	40,600.0	17,620.0	0.0

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.

As shown in the table, the following source groups contribute with the major mercury inputs: Primary metal production (excl. gold production by amalgamation); waste water system/treatment; other fossil fuel and biomass combustion; and crematoria and cemeteries; Informal dumping of general waste; Gold extraction with mercury amalgamation; and other materials production.

The individual mercury release sub-categories contributing with the highest mercury inputs were: Primary metal production (excl. gold production by Mercury amalgamation); waste water system/treatment; other fossil fuel and biomass combustion; and crematoria and cemeteries. The individual mercury release sub-categories contributing with the highest mercury releases to the atmosphere were: Primary metal production (excl. gold production by amalgamation); other fossil fuel and biomass combustion; Gold extraction with mercury amalgamation; and other materials production. Detailed presentation of mercury inputs and releases for all mercury release source types present in the country are shown in the following report sections.

2 Mercury release source types present

Table 2-1 shows which mercury release sources were identified as present and absent, respectively, in the country. Only source types positively identified as present are included in the quantitative assessment.

It should be noted however, that the presumably minor mercury release source types shown in Table 2-2 were not included in the detailed source identification and quantification work.

Table 2-1 Identification of mercury release sources in the country; sources present (Y), absent (N), and possible but not positively identified (?). [Overleaf]

Source category	Source present? Y/N/?
Energy consumption	
Coal combustion in large power plants	Y
Other coal uses	?
Combustion/use of petroleum coke and heavy oil	Y
Combustion/use of diesel, gasoil, petroleum, kerosene	Y
Use of raw or pre-cleaned natural gas	Y
Use of pipeline gas (consumer quality)	?
Biomass fired power and heat production	Y
Charcoal combustion	Y
Fuel production	
Oil extraction	N
Oil refining	N
Extraction and processing of natural gas	Y
Primary metal production	
Mercury (primary) extraction and initial processing	N
Production of zinc from concentrates	N
Production of copper from concentrates	N
Production of lead from concentrates	N
Gold extraction by methods other than mercury amalgamation	Y
Alumina production from bauxite (aluminium production)	N
Primary ferrous metal production (iron, steel production)	N
Gold extraction with mercury amalgamation - without use of retort	Y
Gold extraction with mercury amalgamation - with use of retorts	N
Other materials production	
Cement production	Y
Pulp and paper production	N
Production of chemicals	
Chlor-alkali production with mercury-cells	N
VCM production with mercury catalyst	N
Acetaldehyde production with mercury catalyst	N
Production of products with mercury content	
Hg thermometers (medical, air, lab, industrial etc.)	N

Electrical switches and relays with mercury	N
Light sources with mercury (fluorescent, compact, others: see guideline)	N
Batteries with mercury	N
Manometers and gauges with mercury	N
Biocides and pesticides with mercury	N
Paints with mercury	N
Skin lightening creams and soaps with mercury chemicals	N
Use and disposal of products with mercury content	
Dental amalgam fillings ("silver" fillings)	N
Thermometers	Y
Electrical switches and relays with mercury	N
Light sources with mercury	N
Batteries with mercury	N
Polyurethane (PU, PUR) produced with mercury catalyst	N
Paints with mercury preservatives	N
Skin lightening creams and soaps with mercury chemicals	N
Medical blood pressure gauges (mercury sphygmomanometers)	N
Other manometers and gauges with mercury	N
Laboratory chemicals	N
Other laboratory and medical equipment with mercury	N
Production of recycled of metals	
Production of recycled mercury ("secondary production")	N
Production of recycled ferrous metals (iron and steel)	N
Waste incineration	
Incineration of municipal/general waste	?
Incineration of hazardous waste	Y
Incineration of medical waste	Y
Sewage sludge incineration	N
Open fire waste burning (on landfills and informally)	N
Waste deposition/landfilling and waste water treatment	

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