

MINAMATA
INITIAL
ASSESSMENT
REPORT | 2019
MONGOLIA





MINISTRY OF ENVIRONMENT
AND TOURISM



MINAMATA CONVENTION ON MERCURY

MINAMATA INITIAL ASSESSMENT REPORT 2019

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FOREWORD

Mercury is element that exist in the nature and emits through natural processes, added by significant emissions and releases due to anthropogenic sources in the wake of rapid development of humankind through industrialization. Environmental pollution and increasing risks and impacts on human health caused concerns and drew attention of the world community. In order to overcome this challenge, multilateral environmental agreement was requisite and after a series of negotiations among governments and international organizations, the convention on Mercury came into being.

The Government of Mongolia supported and appreciated the principles and purposes of the Minamata Convention on Mercury from the beginning and ratified it in 2015 by the State Great Khural.

Purpose of the Minamata Convention on Mercury is to protect the environment and human health from the adverse impacts of mercury and mercury compounds from anthropogenic sources and put into effect on 16 August 2017.

Mongolia, by joining the convention as a Party, accepts the responsibilities to fulfill the obligations of the convention, such as phasing out the import and use of mercury-added products, including different types of mercury batteries, switches, fluorescent bulbs, cosmetics, pesticides and measuring devices and subsequently bring in alternatives, eliminate illegal use of mercury in artisanal and small-scale gold mining by offering mercury-free alternatives.

Ministry of Environment and Tourism, together with the United Nations Industrial Development Organization with funding from the Global Environmental Facility implemented the Minamata Initial Assessment project in 2017-2019 and estimated the mercury emissions and releases in the country, assessed the laws and regulations in relation to mercury and convention provisions, as well as recommended priority actions with plans for the successful implementation of the convention.

Taking this opportunity, gratitude should be expressed to the Global Environmental Facility for enabling this project through funding and the United Nations Industrial Development Organization for successful and timely implementation of the project.

In conclusion, it should be underlined that Mongolia is committed to fulfill the obligations by the Minamata Convention in line with national challenging issues related to mercury through an integrated plan and believe it would contribute to achieve our mission to create safe and healthy environment for the people through environmental sustainability and green development.

Ministry of Environment and Tourism

EXECUTIVE SUMMARY

Mercury is a heavy metal that is present in nature in versatile forms such as in elemental or metallic forms and in form of organic and inorganic compounds. Mercury can be found in natural minerals and raw materials such as coal, crude oil, limestone and metal ores. Average concentration in Earth's crust is approximately 0.5 mg/kg, but varies from place to place. Mercury also enters into environment as a result of natural processes such as volcanic eruption and forest fires.

About half of the releases of mercury into the environment is from human activities, such as the combustion of coal, refining of petroleum products, the extraction of metals from ore, and the use and disposal of consumer products containing mercury (e.g. batteries and light bulbs). Amalgam from dentistry also contributes to the release of mercury.

The most toxic forms of mercury are its organic compounds, known as organic mercury. The methyl-mercury and dimethyl-mercury are the most common and toxic compounds. They are bio-accumulative in human, animal or plant tissue. Also they are known as volatile and soluble in water. Mercury vapor and methyl mercury poisoning can result in acute toxicity, leading to death. Common symptoms of mercury poisoning include peripheral neuropathy (presenting as paresthesia or itching, burning or pain), skin

discoloration (pink cheeks, fingertips and toes), swelling, and desquamation (shedding of skin).

In addition to the direct risks described above, mercury impacts on human health can have significant socio-economic implications. Neurological damage resulting in impaired prenatal brain development can lead to reduced intellectual quotient (IQ) points, with associated costs for society stemming from direct and indirect loss of earnings and education.

The world community acknowledges the sufficient global adverse impacts from mercury and its compounds on environment and human health and approved a convention on mercury for the purpose of protecting the human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds in Kumamoto, Japan, in 2013. Mongolia signed the convention on 10 October 2013 and ratified it on 28 September 2015.

The convention encourages introduction of alternatives and BAT/BEP to products and processes that emit and release mercury, and controlling and phasing out the use of mercury-added products.

National inventory of mercury emissions and sources was conducted through the Minamata Initial Assessment Mongolia Project, implemented by the United Nations Industrial Development Organization together with the

Ministry of Environment and Tourism with financial support from the Global Environment Facility. UNEP Toolkit for Identification and Quantification of Mercury Sources and Emissions was used with national data from 2013-2018.

The inventory results estimated that a total of 93,468.0 kg of mercury is emitted and released per year in Mongolia and 96.31% of this release was from primary (virgin) metal production. The second largest source is extraction and use of fuels/energy sources, which account for 1.47% of the total release. Mercury-added products (thermometers, switches, relays, light bulbs, batteries etc.) releases 0.67%, waste deposition/landfilling and waste water treatment releases 0.58%, cement and lime production emits 0.40%, waste burning emits 0.29%, manometers and gauges with mercury, laboratory chemicals and equipment with mercury 0.19%, production of recycled ferrous metal 0.05%, and crematoria and cemeteries 0.05%.

Of the total amount, 76% of mercury released to soil, 16% to air, 2% to water, whereas 4% to by-products and impurities, 1% to general waste and 1% to sector-specific treatment/disposal.

Mongolia banned the use of mercury in minerals exploration and processing in 2008 and stopped the operation of mills that use mercury amalgamation in their operation of gold

processing and cleaned out contaminated sites in 2008-2009. During this inventory, in Mongolia no other hot-spots of mercury contamination have been identified. Interim storage of mercury with a special container of 1 tonne capacity was built in 2015 and stored the confiscated mercury together with mercury compounds collected during the national obsolete chemicals inventory, conducted in 2014. For the time being, over 300 kg liquid mercury and 18 kg mercury compounds are being stored in the storage.

Assessment was made to evaluate the current regulatory coordination in force in the country in line with the successful implementation of the convention. Convention's every articles and provisions, relevant to Mongolian condition, had been assessed in context of Mongolia and recommendations for necessary actions made for the improvement the legal framework.

Based on the initial assessments of the Minamata Convention on Mercury, we set the priorities for action, bearing in mind the objective on reducing risks from primary anthropogenic sources of mercury on human health and the environment and developed implementation plan for the successful fulfillment of obligations and responsibilities of the Minamata Convention on Mercury.

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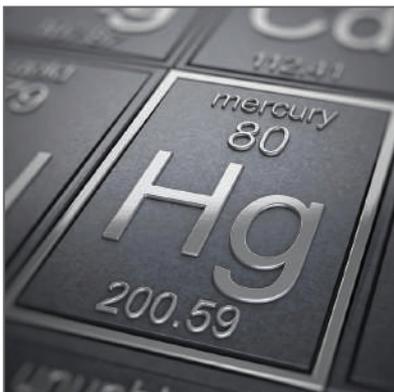
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Lascaux, France



INTRODUCTION

1.1 MERCURY

Mercury is a heavy metal that is present in nature in versatile forms such as in elemental or metallic forms and in form of organic and inorganic compounds.

Elemental mercury - Hg is silvery-white, odorless metal, which is liquid at normal temperature and boils at 356.7°C. Mercury is 13.5 times heavy than water, vapors at 12.7°C with a freezing point of -38.87°C.

Main applications of mercury are mainly in temperature and pressure measuring equipment such as thermometer, barometer, thermostat and fluorescent light bulbs, batteries and electrical breaker. It is also used for manufacture of paint, caustic soda, chlorine gas and gold extraction.

Inorganic mercury or mercury salts (mercury chloride, mercury nitrate etc.)

Most of inorganic compounds are white powder or crystals, ionizing and combining easily with water and particles in the air. Inorganic mercury is widely used in fungicide and in cosmetic ingredients.

The most toxic forms of mercury are its organic compounds, known as organic mercury. The methyl-mercury and dimethyl-mercury are the most common and toxic compounds. They are bio-accumulative in human, animal or plant tissue. Also they are known as volatile and soluble in water.

Mercury is a heavy metal that is present in nature in versatile forms such as in elemental or metallic forms and in form of organic and inorganic compounds. Mercury can be found in natural minerals and raw materials such as coal, crude oil, limestone and metal ores. Average concentration in Earth's crust is approximately 0.5 mg/kg, but varies from place to place. Mercury also enters into environment as a result of natural processes such as volcanic eruption and forest fires (1).

About half of the releases of mercury into the environment is from human activities, such as the combustion of coal, refining of petroleum products, the extraction of metals from ore, and the

use and disposal of consumer products containing mercury (e.g. batteries and light bulbs). In the wake of industrialization development, the amount of mercury release from human activities has increased 2-4 times.

Another potential source of mercury pollution is breakage of mercury containing equipment and devices, which can be released into houses and workplaces. Amalgam from dentistry also contributes to the release of mercury.

In environment, mercury can be converted to various forms. For example, it can be transformed into a highly toxic compound called methyl mercury, which can accumulate in living organisms and biomagnify, i.e. increase in concentration as it moves up to the food chain because of biological processes.

Mercury vapor poisoning can result in acute toxicity, leading to death. Common symptoms of mercury poisoning include peripheral neuropathy (presenting as paresthesia or itching, burning or pain), skin discoloration (pink cheeks, fingertips and toes), swelling, and desquamation (shedding of skin). In case of acute toxicity, following symptoms potentially appear: dizzying, vomiting, cough and phlegm and/or lung tissue irritation, kidney, mouth, stomach and/or gastrointestinal damage, increased saliva, sore gums.

The main exposure routes are inhalation, ingestion and skin absorption. Inhalation of elemental mercury and consumption of organic mercury contaminated food causes major toxicity for human.

The central nervous system is very sensitive to mercury vapor. Chronic exposure is characterized by behavior changes, weakness, fatigue, weight loss, gastro-intestinal dysfunction, tremors in finger, eyelids and lips, memory loss, insomnia and depression. Mercury sensitizes and allergens skin and damages kidney. Mercury affects reproductive system as well as to unborn child.

1.2 ENVIRONMENTAL RISKS

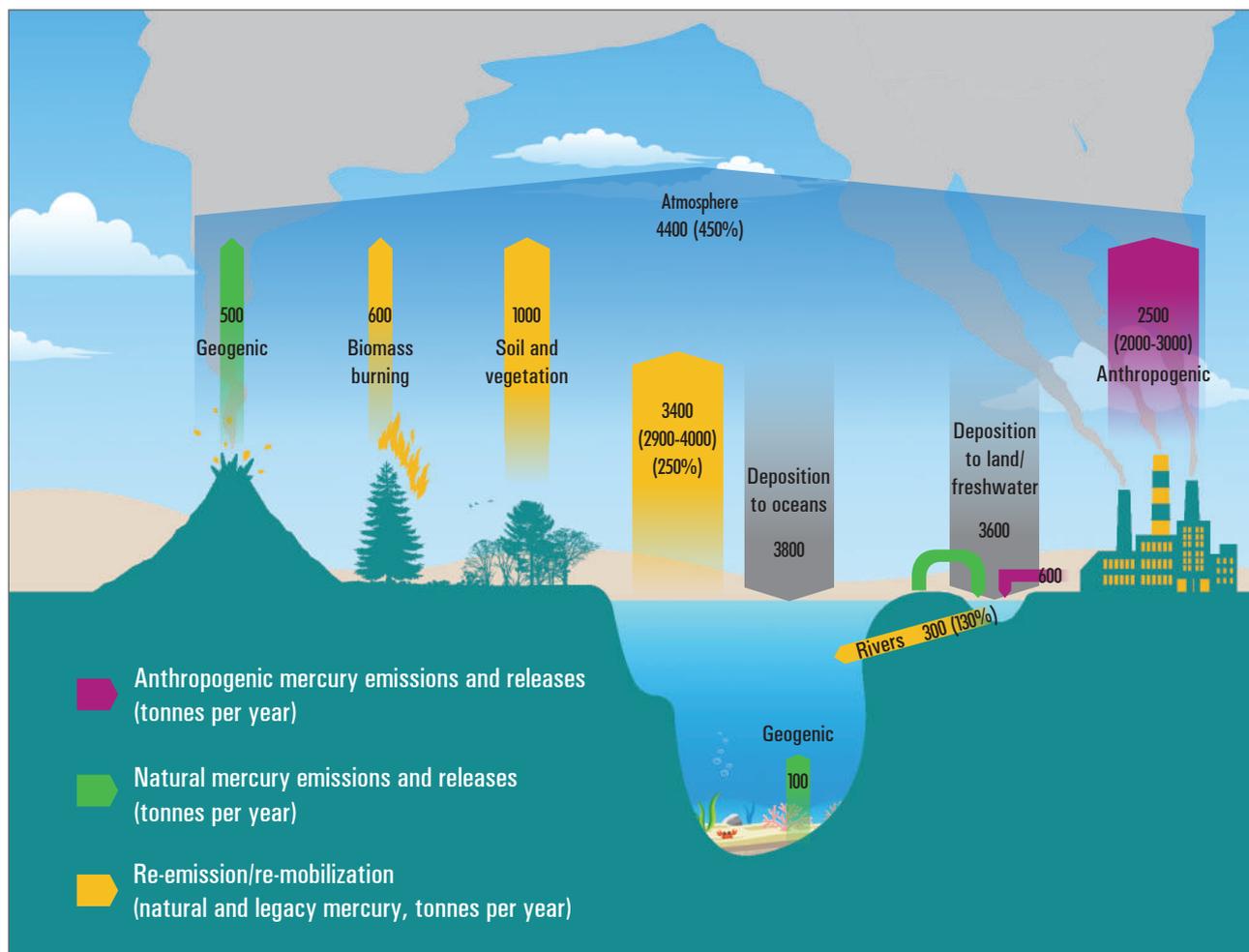


Figure 1. The Mercury Cycle in Environment

Elemental mercury, as it does not decompose in environment, once released to environment is persistent and transferred in air, water, soil and bio-organisms for a long period (Figure 1). Since elemental mercury is volatile, it is released into air mostly and is able to travel long distances through air with grasshopper effects. Mercury released into the air can be later deposited in soil and surface water through precipitations and further, it penetrates down to the ground water. Impacts of mercury are most significant in the Arctic, where no mercury source is present, which is result

of mercury's persistency and its ability to travel long distances.

As noted above, methyl mercury can accumulate in living organisms and biomagnify as it moves up to the food chain. For example, fish-eating predators such as loons and larger fish have been observed to bioaccumulate high levels of methyl mercury.

Depending on the level of exposure, effects on humans, fish and wildlife can include slower growth, reproductive failure, and the development of abnormal behaviors that can affect survival (1).

1.3 HUMAN HEALTH RISK



Impacts of mercury on human health duly depend on forms of mercury, concentration and exposure pathways. Most compounds of mercury affect the nervous system, the central nervous system, kidneys and lungs, and they can cause brain damage, as well as affect fetus in pregnant woman and thus result in nervous system anomaly and disability of children.

The most toxic compound of mercury – methyl mercury – poses serious human health risks through fish and sea foods. Methyl mercury is a potent neurotoxin that is readily absorbed, distributed and passed through the protective blood-brain barrier, affecting the central nervous system. In pregnant women, it can cross the placenta into the fetus, accumulating in the fetal brain and other tissues. Methyl mercury is particularly damaging to the development of infants and young children, who are especially vulnerable given that their nervous systems are still developing (1).

Humans can be exposed to elemental mercury through inhalation of mercury vapours,

which can be absorbed by lung tissues. This vapour easily penetrates the blood-brain barrier and is a well-documented neurotoxin. Neurological and behavioural disorders associated with exposure include tremors, insomnia, memory loss, neuromuscular changes, and headaches (1).

In addition to the direct risks described above, mercury impacts on human health can have significant socio-economic implications. For example, neurological damage resulting in impaired prenatal brain development can lead to reduced intellectual quotient (IQ) points, with associated costs for society stemming from direct and indirect loss of earnings and education (1). A study in Europe estimated that the cost of IQ loss in Europe as a result of mercury pollution is in the range of \$13,000 per 1 kg of mercury emitted to air (2). Similarly, an American study has estimated that the collective cost of IQ loss resulting from exposure of American children to anthropogenic methyl mercury is US\$0.7–13.9 billion annually (3).

1.4 MERCURY EMISSION SOURCES

UNEP has identified four types of mercury emissions: primary natural sources, primary anthropogenic sources, secondary anthropogenic sources and re-mobilization/re-emission.

fuels (e.g., coal) and mining and ore processing.

Fossil fuel combustion for power and heating is estimated to represent approximately 46% of global anthropogenic mercury emissions.

Secondary anthropogenic sources of mercury refer to releases that occur during the use, disposal and incineration of mercury-containing products such as batteries, paints, thermometers, and electrical and electronic devices. Disposal of these products, particularly via incineration, accounts for 5–7% of total estimated global anthropogenic releases. Mercury is also used and released in many industrial processes, such as industrial and artisanal gold mining and the production of chemicals.

Re-mobilization and re-emission of mercury to the atmosphere occurs when previously deposited mercury (from either anthropogenic or natural sources) is re-introduced into the atmosphere. For example, mercury that has accumulated in soil or sediments can be re-mobilized in water as a result of heavy rain or floods. Similarly, mercury accumulated in vegetation can be re-emitted to the air during forest fires.



Source: UNEP

Figure 2. Key Sources of Mercury

Primary natural sources of mercury include volcanic activity and natural erosion of mercury-based deposits. Geothermal activity can also remove mercury from underground and release it to the atmosphere. Some recent models suggest that primary natural sources account for about one third to one half of mercury emissions to the atmosphere (1,4).

Primary anthropogenic (i.e., human) sources of mercury occur when mercury in raw materials is mobilized, through such activities as the combustion of fossil



WHAT IS THE MINAMATA CONVENTION?

It is an international agreement that aims to protect people and the environment from mercury.

The health sector is working to:

1. Phase out thermometers and blood pressure devices that contain mercury.
2. Improve oral health and reduce dental amalgam use.
3. Implement strategies to protect small-scale gold miners and other artisanal miners.
4. Monitor mercury exposure and provide health advice.

Everyone can contribute:

- Dispose of mercury-containing products safely.
- Choose mercury-free products when possible.

World Health Organization

MINAMATA CONVENTION ON MERCURY

UN MINAMATA environment CONVENTION ON MERCURY

The first Global Mercury Assessment by UNEP (1) acknowledges the sufficient global adverse impacts from mercury and its compounds on environment and human health to warrant further international actions to tackle the issues after determining that mercury can be transported long distance by air, emits and released from anthropogenic sources and bioaccumulates in the environment (5).

UNEP, with the UNEP's Global Mercury Partnership started a programme to address the concerns posed by mercury urged Governments to adopt goals for the reduction of mercury emissions and releases. Governing Council of UNEP decided to develop a global legally binding instrument on mercury in 2009 and promptly established an Intergovernmental Negotiating Committee (INC) next year.

After a series of negotiations, INC, on 19 January 2013, concluded with about 140 governments agreeing to the draft of convention text in Geneva, Switzerland, and on 7-10 October 2013, at a Conference of Plenipotentiaries (Diplomatic Conference) in Kumamoto, Japan, the convention was adopted and opened for signature (5).

The objective of the Minamata Convention is to protect the human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. The convention encourages introduction of alternatives and BAT/BEP to products and processes that emit and release mercury, and controlling and phasing out the use of mercury-added products (5).

Mongolia signed the convention on 10 October 2013 and ratified it on 28 September 2015. As of May 2019, 128 countries signed the convention and 107 countries joined as Party. The Minamata Convention on Mercury was put into force on 16 August 2017.

2.1 KEY ARTICLES AND OVERVIEW OF THE MINAMATA CONVENTION

Obligations and responsibilities by the Parties, as set forth in the convention text, to implement the convention are introduced below (6).

1/ MERCURY SUPPLY SOURCES AND TRADE

- Each Party shall only allow primary mercury mining that was being conducted within its territory at the date of entry into force of the Convention for it for a period of up to fifteen years after that date.

- Mercury from such mining shall only be used in manufacturing of mercury-added products, in manufacturing processes, or be disposed, using operations which do not lead to recovery, recycling, reclamation, direct re-use or alternative uses

- The Party determines that excess mercury from the decommissioning of chlor-alkali facilities is available, such mercury is disposed of, using operations that do not lead to recovery, recycling,

reclamation, direct re-use or alternative uses.

- Trade of mercury between Parties is allowed only in case if the importing party provided written consent.

- Parties export mercury to a non-party only that has provided exporting Party with its written consent and only for the purpose of a use allowed to the importing Party under this Convention; or for environmentally sound interim storage.

- Parties shall not allow the import of mercury from a non-Party to whom it will provide its written consent unless the non-Party has provided certification that the mercury is not from sources identified as not allowed.

2/ MERCURY-ADDED PRODUCTS AND MANUFACTURING PROCESSES IN WHICH MERCURY OR MERCURY COMPOUNDS ARE USED

- Each Party shall not allow, by taking appropriate measures, the manufacture, import or export of mercury-added products listed in Part I of Annex A after the phase-out date specified for those products.

- Parties shall take measures to phase down the use of dental amalgam and shall take appropriate measures listed in the convention Part II in Annex A.

- Parties shall phase out specified

manufacturing processes listed in Part I in Annex B by the year 2018 and 2025 and take measures to reduce mercury using processes listed in Part II in Annex B.

- Parties may register for exemption and extension of phase-out date by notifying the Secretariat in writing the statements explaining the need.

- Parties shall discourage the development of any facility using any

other manufacturing process in which mercury or mercury compounds are intentionally used that did not exist prior

to the date of entry into force of the Convention.

3/ ARTISANAL AND SMALL-SCALE GOLD MINING

- Parties that has artisanal and small-scale gold mining and processing subject to this Article within its territory shall take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing
- Parties shall notify the Secretariat

if at any time the Party determines that artisanal and small-scale gold mining and processing in its territory is more than insignificant and shall develop a national action plan with national objectives and reduction targets to eliminate whole ore amalgamation, open burning of amalgam or processed amalgam, burning of amalgam in residential areas etc.

4/ EMISSIONS AND RELEASES

- For its new sources, Parties shall require the use of best available techniques and best environmental practices to control and, where feasible, reduce emissions, as soon as practicable but no later than five years after the date of entry into force of the Convention for that Party.
- For its existing sources, each Party shall include in any national plan, and shall implement, one or more measures such as setting emission limit values and the use of best available

techniques and best environmental practices, taking into account its national circumstances, and the economic and technical feasibility and affordability of the measures, as soon as practicable but no more than ten years after the date of entry into force of the Convention for it.

- Parties shall control and where feasible reduce mercury emissions and releases to soil and water from specific sources through a multi-pollutant control strategy that would deliver co-benefits for control of mercury or the use of BAT/BEP.

5/ INTERIM STORAGE, MERCURY WASTES AND CONTAMINATED SITES

- Parties shall take measures to ensure that the interim storage of mercury and mercury compounds intended for a use allowed to a Party under this Convention is undertaken in an environmentally sound manner.
- Parties shall take appropriate

measures so that mercury waste is managed in an environmentally sound manner, taking into account the guidelines developed under the Basel Convention, only recovered, recycled, reclaimed or directly re-used for a use allowed to a Party under this Convention

or for environmentally sound disposal.

- Parties shall endeavour to develop appropriate strategies for identifying and

assessing sites contaminated by mercury or mercury compounds.

6/ HEALTH ASPECTS, PUBLIC INFORMATION, AWARENESS AND EDUCATION AND REPORTING

- Parties are encouraged to promote the development and implementation of strategies and programmes to identify and protect populations at risk, particularly vulnerable populations, and which may include adopting science-based health guidelines relating to the exposure to mercury and mercury compounds.

- Parties shall promote and facilitate actions to provide the public of information

on the health and environmental effects of mercury and mercury compounds, alternatives to mercury and mercury compounds.

- Parties shall report to the Conference of the Parties, through the Secretariat, on the measures it has taken to implement the provisions of this Convention and on the effectiveness of such measures.

7/ FINANCIAL RESOURCES AND MECHANISM

- Financial resources to implement the convention measures may include domestic funding through relevant policies, development strategies and national budgets, and bilateral and multilateral funding, as well as private sector involvement. A Mechanism for the provision of adequate, predictable, and timely financial resources is hereby defined to be the Global Environment Facility Trust Fund and a specific international Programme to support capacity-building and technical assistance.

- The Parties, are encouraged, on an urgent basis, to enhance and increase their activities on mercury in support of developing country Parties in the implementation of this Convention relating to financial resources, technical assistance and technology transfer.

- A mechanism, including a Committee as a subsidiary body of the Conference of the Parties, is established to promote implementation of, and review compliance with, all provisions of this Convention.



3

NATIONAL BACKGROUND INFORMATION

3.2 POLITICAL STRUCTURE AND ADMINISTRATIVE UNITS



Mongolia is a parliamentary republic. The supreme legislative body is the State Great Hural and the Government of Mongolia is the supreme executive body in Mongolia.

Mongolia is divided into 21 provinces (aimags) and the Capital city, which are in turn divided into 9 districts and 330 soums and into 1,588 khoroos and bhags (smallest administrative units).

Number of household is 885,600, 43.6% of which or 317,100 households live in Ulaanbaatar (7).



3.3 MEMBERSHIP OF INTERNATIONAL AND REGIONAL ORGANIZATIONS



Mongolia joined several international multilateral legal instruments, including 49 instruments of the United Nations, 4 instruments on diplomatic and consular relationships, 1 on law of treaties, 44 on human rights, 22 on international security and non-proliferation and prohibition of weapons, 6 on humanity, 26 on crime, 32 on international trade and development, 13 on transport, communications and customs cooperation, 21 on intellectual property, 22 on marine, 14 on civil aviation, 5 on space, 23 on environmental protection, and 4 on arbitration, which all total at 287 legal instruments.

The following are multilateral environmental agreements for the protection of human health and the environment from toxic and hazardous chemicals Mongolia joined, including:

- United Nations Framework Convention

on Climate Change (1993);

- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1996);

- The Vienna Convention for the Protection of the Ozone Layer (1996);

- The Montreal Protocol on Substances that Deplete the Ozone Layer (1996);

- The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1999);

- The Stockholm Convention on Persistent Organic Pollutants (2003).

- **The Minamata Convention on Mercury (2015)**

3.4 SOCIAL AND ECONOMIC PROFILE

Economically active population constitutes 42.7% in Mongolia and the unemployment rate is 8.8% (7).

Table 1. Employment

	2014	2015	2016	2017
Total number of population, in thousands	2995.9	3057.8	3119.9	3177.9
Annual population growth, in %	2.00	2.00	2.00	1.8
Employment rate, in %	57.2	56.9	54.5	55.8
Unemployment rate, in %	7.9	7.5	10.0	8.8
Average monthly salary of employees, MNT, in thousands	796.6	808.0	861.9	944.5

The country's economy was relatively good in 2011 with GDP growth of 17.3%, but since then it decreased until 2016 with slight improvement in 2017 with 5.1%. GDP per capita is 5439.4 thousand MNT i.e. 2,291US\$ by the World Bank Atlas method (7).

GDP from main sectors as following: 22.6% from mining and quarrying; 10.6% from agriculture, forestry and fishing; and 10.2% from manufacturing (7).

Mongolia is rich in gold, copper and coal deposits and the production has been increasing year after year. In 2010, 25.2 million tonnes of coal was produced, where in 2017, the number reached 48.1 million tonnes or almost doubled (7).

Ferrous and non-ferrous metal production of 2010 compared to 2017: increases in iron ore 2.5 times (7.7 mln tonnes), iron ore concentrate 29 times (3.7 mln tonnes), molybdenum concentrates 30% (5,760 tonnes), copper concentrates 2.5 times (1.3 mln tonnes) and gold 3.3 (19.8 tonnes), where production of zinc concentrates reduced by 27% (82.7 thousand tonnes) (7).

Mongolia has harsh continental

climate and cold season continues for 6 months with air temperature drops down to -40°C. Main source of heating is coal and all power and thermal plants, boilers and household stoves use coal. Households use coal with addition of firewood for heating and cooking and on the average, one household use 3-4 tonnes of coal and 2-3.5 m³ firewood.

Coal production and usage has been increasing steadily recent years, using 6.9 million tonnes in 2010 whereas it reached 9.3 million tonnes in 2017 with 78% used in power plants and 7.3% in household stoves, where the remaining used in other sectors (7).

There were no research on mercury-added products had been conducted except medical appliances and tools and no official records and control practice at the customs on imported goods and equipment whether they contain mercury or not, therefore, no data is available.

The Ministry of Health conducted a survey of medical mercury containing equipment and devices in Ulaanbaatar, Darkhan and Erdenet cities and Uvurkhanghai province, covering 578



units and sections of 32 hospitals and clinics in 2010. 797 devices were registered; including 38% of which is thermometers and 24% is sphygmomanometers. Dental amalgam is used in 14.7% of dental clinics and wastes are discharged directly to the sewage system, which can be a potential source of polluting outer environment. (8). Purchase of mercury-added medical instruments, including dental amalgam, was banned by the joint order 07/27 of 2011 by the Minister and Health and the Chief of National Emergency Management Authority.

A list of varieties and quantity of pesticides, disinfectants and fertilizers to be used in Mongolia is approved annually by a joint order of the Minister of Nature, Environment & Tourism, the Minister of Food, Agriculture & Light Industry and the Minister of Health and permits are

issued strictly in accordance with this list. Mercury-containing pesticides are not included in the list.

The first wastewater treatment facility was created in 1959 and there are 140 treatment facilities operating nationwide, as of 2018, out of which 65 with mechanical treatment; 33 natural bio-treatment; 35 artificial bio-treatment; and 4 industrial treatment. These facilities treat 87,062,200m³ of sewage and wastewater daily in 2017 (9).

There is no waste incineration facility in the country. In 2018, 3.2 million tonnes of waste was buried at 390 dump sites nationwide (9). There is only 1 designated landfill site in Ulaanbaatar at Narangiin Enger and other are just dump sites. Medical wastes in rural areas are incinerated in the hospitals' small stoves and furnaces, however, these incinerators are primitive as a technology and they

have no emissions monitoring system, making them significant contributors to air pollution.

Population of Ulaanbaatar city has been increasing intensely in the last 10 years adding to the burden of waste generation in the city, from 428,9 thousand tonnes of waste in 2010 to 1.4 million tonnes in 2018, almost 3 times increase. Household wastes make 86%

and industrial waste 12% of total waste. Waste composition differs seasonally, for example, in winter time ash composes almost half of the total waste generated (10).

There's no iron ore processing industry in Mongolia, but scrap metal plant is operating.

Table 2. Production of Major Industrial Commodities 2017 (7)

COMMODITIES	UNIT	2017
Electricity	mln.kwt.h	6 027.3
Thermal energy	thous.Gcal	11 296.4
MINING AND QUARRYING:		
Coal	thous.t	48 145.1
Crude oil	thous.barrel	7 624.1
Copper with concentrate	thous.t	1 317.6
Molybdenium with concentrate	thous.t	5 759.6
Gold	t	19.8
Iron ore	thous.t	7 694.7
Iron ore concentrates	thous.t	3 675.0
Zincum concentrates	thous.t	82,7
MANUFACTURING:		
Metal steel	thous.t	21.0
Metal foundries	thous.t	16.3
Cement	thous.t	675.2
Lime	thous.t	56.2
Bricks	mln pcs	23.0

3.5 ENVIRONMENTAL OVERVIEW (11)

As of 2018, the unified land territory of Mongolia included 114809.2 thousand ha of agricultural land (73.4%); 859.7 thousand ha of cities, villages, and other settlements land (0.5%); 474.3 thousand ha of transportation and network land (0.3%); 14341.4 thousand ha of forest resources land (9.2%); 686.1 thousand ha of water resources land (0.4%); and 25240.9 thousand ha of state special needs land (16.1%)

As of December, 2016, there were a total of 13488.3 thousand ha or 8.6% of the total territory licensed, which included a total of 1411.56 thousand ha granted with 1,558 mining licenses and a total of 12077 thousand ha with 2,022 exploration licenses. According to the recent seven year averages, the mining industry accounted for 16.7% in the gross domestic products (GDP) and 68.7% in the total industrial products having led in the county's economy.

As of 2016, artisanal and small scale gold mining was undertaken in 96 unit areas covering 1637.71 ha in 34 soums (sub-provinces) of 16 aimags (provinces). In addition to formally organized small scale miners, illegal artisanal miners (who are not organized) do extract the minerals such as gold, tungsten, red stone, and fluorspar in territories of about 20 soums of 15 aimags including Zaamar soum of Tuv aimag, Gurvan Tes soum of Umnugovi, Bayan-ovoo and Bumbugur soums of Bayankhongor aimag, Yuruu soum of Selenge aimag, Tsetseg soum of Khovd aimag, and Yusunbulag soum of Govi-Altay aimag.

Either formal small scale miners or

informal illegal artisanal and small scale miners do engage irresponsibly in the mining activities without assuming the responsibility to carry out environmental protection and restoration and meet the basic occupational health and safety requirements in the highly risky conditions those would lead to loss of their lives, health, and material.

According to the statistics of mineral licenses, there're a total of 3,078 valid licenses, of which 1,673 mining license and 1,405 for exploration. About 30% of total mining licenses or 566 for gold mining, including 459 for placer and 107 for hard-rock mining.

A total of 6782.17 ha was disturbed and damaged and of which, 2.42% or 163.99 ha was disturbed by geological prospecting and exploration; 60.65% or 4113.68 ha was by mining; 2.58% or 175.0 ha was by the national defence and security related activities; 1.12% or 76.03 ha was by construction and engineering network building and maintenance; and 31.72% or 2151.38 ha was by transportation and telecommunication construction and services.

Land conservation and restoration measures were taken in a total of 2,203,702.67 ha including a total of 193,932.33 ha of cultivated land; in a total of 1,902,066.22 ha of pastureland and other grasslands; in a total of 10,729.57 ha of cities, villages, and other settlements land; in a total of 100,749.24 ha of forest resources land; in a total of 676.39 ha of water resources land; in a total of 1,561.92 thousand ha of mining land.

Air quality in local (aimag and soum) settlements and their centres: one of main air pollution sources was the stoves and boilers used for heating and boiling. According to the 2016 inventory, there were a total of 259,987 stoves/boilers with capacities up to 10kW in use counted. Of them, there were 240,902 traditional wood-coal burning stoves and 19,085 improved (fuel efficient) stoves. For these household stoves, a total of 631,843 tons of coal and 1,031,256 m³ of fuel wood were used for burning in 2016. There were also 2,839 boilers with up to 11-100 kW capacities and 527 steam and water heating boilers with more than 101 kW capacities recorded in local areas.

A total of 281,149 motor (passenger) vehicles were registered in the local areas and which were increased by about 24 thousands in comparing to that in 2015. Regarding average ages of the vehicles in use, the 4% of the total registered vehicles were 0-3 years; 10% were 4-6 years; 6% were 6-9 years; and 80% were 10 years and more in operation.

Permanent air quality monitoring stations in local areas showed that the average annual concentrations of sulphur gas emission were 3-36 mg/m³, nitrogen dioxide were 7-56 mg/m³, and PM10 were 18-173 mg/m³.

According to the permanent air quality monitoring stations in local areas, the sulphur gas emissions in Bayankhongor and Dalanzadgad towns were higher by 1,6-1,8 times than its precaution value in 2015.

Air quality in Ulaanbaatar city: in cold season, main air pollution sources in Ulaanbaatar include the traditional stoves and water heating boilers used in its ger districts (80%), motor vehicles

(about 10%), the combined heat and power plants (CHPs) (about 6%), and wastes and soil pollution (about 4%).

When compared average monthly pollutant concentrations in the air (October-December, 2015 and January-April, 2016) to that in the same months of previous years of 2014 and 2015, the PM10 and nitrogen dioxide concentrations were lower by 23% and 5% respectively, while the PM2.5 and sulphur gas emissions were higher by 6% and 41% respectively.

Average annual sulphur gas emissions in the air of Ulaanbaatar city were higher by 2,4 times and 3 times than its precaution value in 2015 and 2016 respectively.

In recent years, the air pollution mitigation measures to change traditional stoves with energy efficient stoves, to reduce numbers of individual low pressure boilers as connected to the central piped heating system, to put a CHP in operation in the eastern part of the Capital City, to repair and change crossroads and interchanges for less traffic congestion and improved traffic conditions, and to implement housing programme were taken through projects and programmes. However, the air quality and pollution in particular in cold season is much worsened and higher several times than the standard levels. Hence, it is necessary to take effective actions against the air pollution upon consideration of the current situation of the city.



4



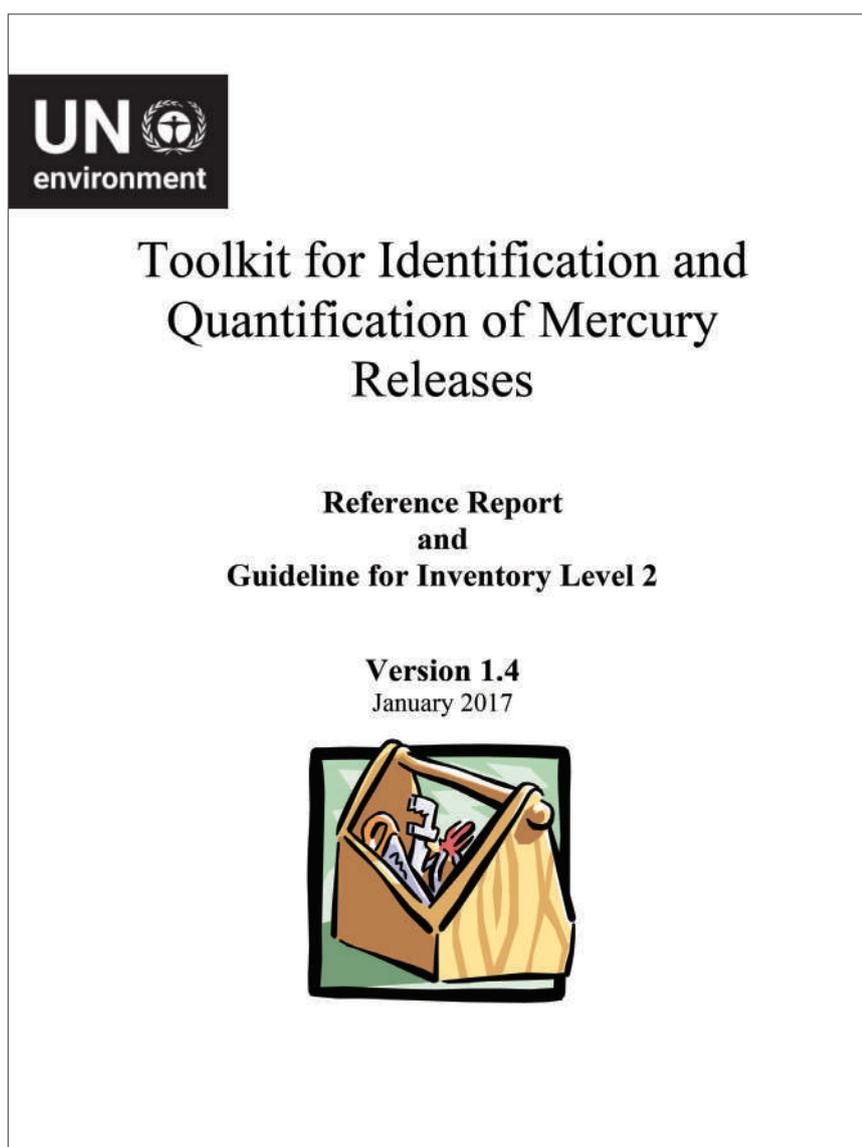
MERCURY INVENTORY AND IDENTIFICATION OF EMISSIONS AND RELEASES IN MONGOLIA

4.1 INVENTORY METHODOLOGY

National inventory of mercury emissions and sources was conducted through the Minamata Initial Assessment Mongolia Project, implemented by the United Nations Industrial Development Organization together with the Ministry of Environment and Tourism with financial support from the Global Environment Facility. UNEP Toolkit for Identification and Quantification of Mercury Releases was used with national data from 2013-2018.

Training workshop on principles and methodologies on how to use the “Toolkit for Identification and Quantification of Mercury Releases” (Level II, version 1.04, 2017) was organized by the project in 9-11 January 2018 in Ulaanbaatar by Mr. Jakob Maag, who developed the toolkit, for the inventory team (The Institute of Chemistry and Chemical Technology) and representatives of other stakeholders, including public and private institutions and a company. Among other things, information on how to collect data from various sources that is not available or complete in the country, how to determine input factors and output distribution factors, and worked in groups, using the toolkit.

The inventory used the toolkit for the calculation of emissions and releases in Mongolia, by collecting required data and information from relevant ministries, government agencies and private businesses, as well as used the National Statistical Yearbook and other official sources such as UN Comtrade.



4.2 MERCURY RELEASE SOURCE TYPES PRESENT

Table 3 shows which mercury release sources were identified as present or absent in the country. Only source types positively identified as present are included in the

quantitative assessment. Sources present is marked as (Y), absent (N), and possible but not positively identified as (?).

Table 3. Identification of mercury release sources in the country

Cat. no.	Source category	Source presence (Y/N/?)
5.1	Main category – Extraction and use of fuels/energy sources	
5.1.1	Coal combustion in large power plants	Y
5.1.2	Other coal combustion	Y
5.1.3	Extraction, refining and use of mineral oil	Y
5.1.4	Extraction, refining and use of natural gas	N
5.1.5	Extraction and use of other fossil fuels	N
5.1.6	Biomass fired power and heat production	Y
5.1.7	Geothermal power production	N
5.2	Main category – Primary (virgin) metal production	
5.2.1	Primary extraction and processing of mercury	N
5.2.2	Gold and silver extraction with the mercury–amalgamation process	N
5.2.3	Zinc extraction and initial processing	Y
5.2.4	Copper extraction and initial processing	Y
5.2.5	Lead extraction and initial processing	N
5.2.6	Gold extraction and initial processing by other processes than mercury amalgamation	Y
5.2.7	Aluminium extraction and initial processing	N
5.2.8	Extraction and processing of other non–ferrous metals	N
5.2.9	Primary ferrous metal production	N
5.3	Main category – Production of other minerals and materials with mercury impurities	
5.3.1	Cement production	Y
5.3.2	Pulp and paper production	N
5.3.3	Lime production and light weight aggregate kilns	Y
5.3.4	Others minerals and materials	N
5.4	Main category – Intentional use of mercury as an auxiliary material in industrial processes	
5.4.1	Chlor–alkali production with mercury–technology	N

5.4.2	VCM (vinyl–chloride–monomer) production with mercury–dichloride (HgCl ₂) as catalyst	N
5.4.3	Acetaldehyde production with mercury–sulphate (HgSO ₄) as catalyst	N
5.4.4	Other production of chemicals and polymers with mercury compounds as catalysts	N
5.5	Main category – Consumer products with intentional use of mercury	
5.5.1	Thermometers with mercury	Y
5.5.2	Electrical and electronic switches, contacts and relays with mercury	Y
5.5.3	Light sources with mercury	Y
5.5.4	Batteries containing mercury	Y
5.5.5	Biocides and pesticides	N
5.5.6	Paints	?
5.5.7	Pharmaceuticals for human and veterinary uses	?
5.5.8	Cosmetics and related products	?
5.6	Main category – Other intentional products/process uses	
5.6.1	Dental mercury–amalgam fillings	N
5.6.2	Manometers and gauges	Y
5.6.3	Laboratory chemicals and equipment	Y
5.6.4	Mercury metal use in religious rituals and folklore medicine	?
5.6.5	Miscellaneous product uses, mercury metal uses and other sources	?
5.7	Main category – Production of recycled metals	
5.7.1	Production of recycled mercury ("secondary production)	N
5.7.2	Production of recycled ferrous metals (iron and steel)	Y
5.7.3	Production of other recycled metals	N
5.8	Main category – Waste incineration	
5.8.1	Incineration of medical waste	Y
5.8.2	Informal waste burning	Y
5.8.3	Incineration of hazardous waste	N
5.8.4	Sewage sludge incineration	N
5.9	Main category – Waste deposition/landfilling and waste water treatment	
5.9.1	Controlled landfills/deposits	N
5.9.2	Diffuse deposition under some control	N
5.9.3	Informal local deposition of industrial production waste	N
5.9.4	Informal dumping of general waste	Y
5.9.5	Waste water system/treatment	Y
5.10	Main category – Cremation and cemeteries	
5.10.1	Crematoria	Y
5.10.2	Cemeteries	Y

	Main category – Potential hot spots	
	Closed/abandoned chlor-alkali production sites	N
	Other sites of former chemical production where mercury compounds are/were produced (pesticides, biocides, pigments etc.), or mercury or compounds were used as catalysts (VCM/PVC etc.)	N
	Closed production sites for manufacturing of thermometers, switches, batteries and other products	N
	Closed pulp and paper manufacturing sites (with internal chlor-alkali production or former use of mercury-based slimicides)	N
	Tailings/residue deposits from mercury mining	N
	Tailings/residue deposits from artisanal and large scale gold mining	?
	Tailings/residue deposits from other non-ferrous metal extraction	?
	Sites of relevant accidents	N
	Dredging of sediments	N
	Sites of discarded district heating controls (and other fluid controls) using mercury pressure valves	N
	Sites of previous recycling of mercury (“secondary” mercury production)	N

Mercury inputs to society is shown in Table 4. This includes mercury intentionally used in products such as thermometers, blood pressure gauges, fluorescent light bulbs, etc. It also

includes mercury mobilised via extraction and use of raw materials which contains mercury in trace concentrations.

Table 4. Summary of Mercury Inputs to Society

Category no.	Source category	Estimated Hg input, Kg Hg/y, by life cycle phase (as relevant)		
		Production phase*1	Use phase	Disposal phase
5.1	Main category – Extraction and use of fuels/energy sources			
5.1.1	Coal combustion in large power plants		1,073.2	
5.1.2	Other coal combustion		283	
5.1.3	Extraction, refining and use of mineral oil	4.0	2.6	
5.1.6	Biomass fired power and heat production		12	
5.2	Main category – Primary (virgin) metal production			
5.2.3	Zinc extraction and initial processing	911		
5.2.4.1	Copper extraction and initial processing	103,622		

5.2.4.2	Production of copper from mining waste	10,841		
5.2.6	Gold extraction and initial processing by other processes than mercury amalgamation	79,169		
5.3	Main category – Production of other minerals and materials with mercury impurities			
5.3.1	Cement production	369		
5.3.3	Lime production and light weight aggregate kilns	5.66		
5.5	Main category – Consumer products with intentional use of mercury			
5.5.1	Thermometers with mercury		43.6	
5.5.2	Electrical and electronic switches, contacts and relays with mercury		445	
5.5.3	Light sources with mercury		4.4	
5.5.4	Batteries containing mercury		34.7	
5.6	Main category – Other intentional products/process uses			
5.6.2	Manometers and gauges		15.9	
5.6.3	Laboratory chemicals and equipment		158.9	
5.7	Main category – Production of recycled metals			
5.7.2	Production of recycled ferrous metals (iron and steel)	42.4		
5.8	Main category – Waste incineration			
5.8.1	Incineration of medical waste			25.0
5.8.2	Informal waste burning			248.1
5.9	Main category – Waste deposition/landfilling and waste water treatment			
5.9.4	Informal dumping of general waste			2,233
5.9.5	Waste water system/treatment			196
5.10	Main category – Cremation and cemeteries			
5.10.1	Crematoria			5.15
5.10.2	Cemeteries			38.10

Notes: *1: Production phase includes raw material production.

4.3 SUMMARY OF MERCURY RELEASES

The inventory results estimated that a total of 93,468.0 kg of mercury is emitted and released per year in Mongolia and 96.31% of this release was from primary (virgin) metal production. The second largest source is extraction and use of fuels/energy sources, which account for 1.47% of the total release.

Mercury-added products (thermometers, switches, relays, light bulbs, batteries etc.) releases 0.67%,

waste deposition/landfilling and waste water treatment releases 0.58%, cement and lime production emits 0.40%, waste burning emits 0.29%, manometers and gauges with mercury, laboratory chemicals and equipment with mercury 0.19%, production of recycled ferrous metal 0.05%, and crematoria and cemeteries 0.05% (Table 5).

Table 5. Summary of Mercury Releases

Source category	Calculated Hg output, Kg/y						Total releases by source category	Percent of total releases*3*4
	Air	Water	Land	By-products and impurities	General waste	Sector specific treatment / disposal		
5.1: Extraction and use of fuels/energy sources	1,314.7	0.7	0.0	0.0	0.0	56.0	1,371.5	1.47%
5.2: Primary (virgin) metal production	12,923.3	1,583.4	71,252.3	3,166.8	0.0	1,084.1	90,009.8	96.31%
5.3: Production of other minerals and materials with mercury impurities*1	221.8	0.0	0.0	75.0	0.0	78.2	375.0	0.40%
5.4: Intentional use of mercury in industrial processes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00%
5.5: Consumer products with intentional use of mercury (whole life cycle)	70.3	18.8	62.1	0.0	471.7	0.0	622.9	0.67%
5.6: Other intentional product/process use*2	1.9	57.2	0.6	0.0	61.0	54.0	174.8	0.19%

5.7: Production of recycled metals	14.0	0.0	14.4	0.0	14.0	0.0	42.4	0.05%
5.8: Waste incineration and burning	264.6	0.0	0.0	0.0	8.9	0.0	273.5	0.29%
5.9: Waste deposition/land filling and waste water treatment*3*4	223.3	321.2	1,786.1	0.0	58.8	39.2	2,428.6	0.58%
5.10: Crematoria and cemeteries	5.2	0.0	38.1	0.0	0.0	0.0	43.3	0.05%
SUM OF QUANTIFIED RELEASES*3*4	15,039	1,883	71,368	3,242	614	1,311	93,458	100.00%

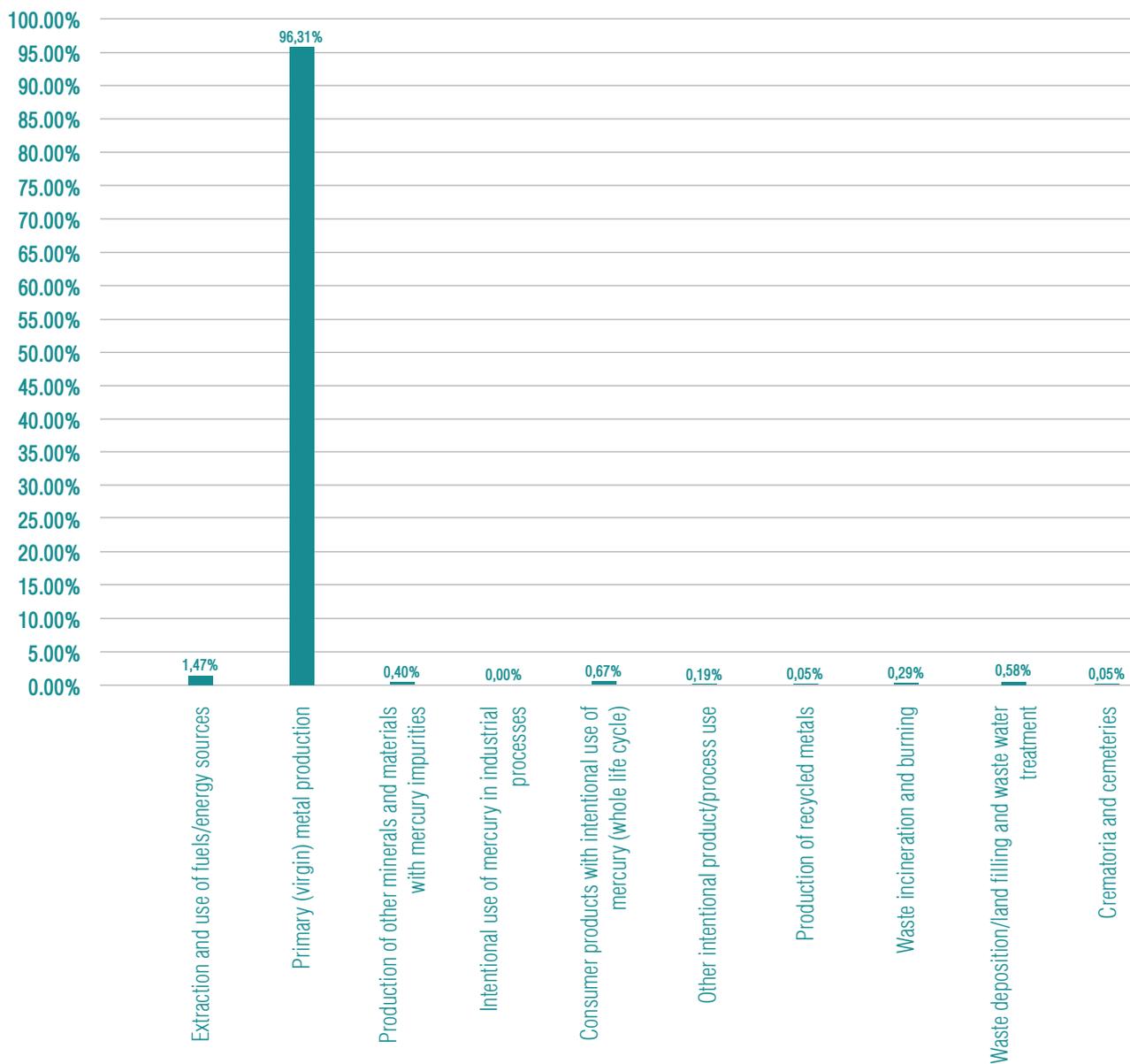


Figure 4. Summary of Mercury Releases (by source types)

Of the total amount, 76% of mercury released to soil, 16% to air, 2% to water, whereas 4% to by-products and impurities, 1% to general

waste and 1% to sector-specific treatment/disposal.

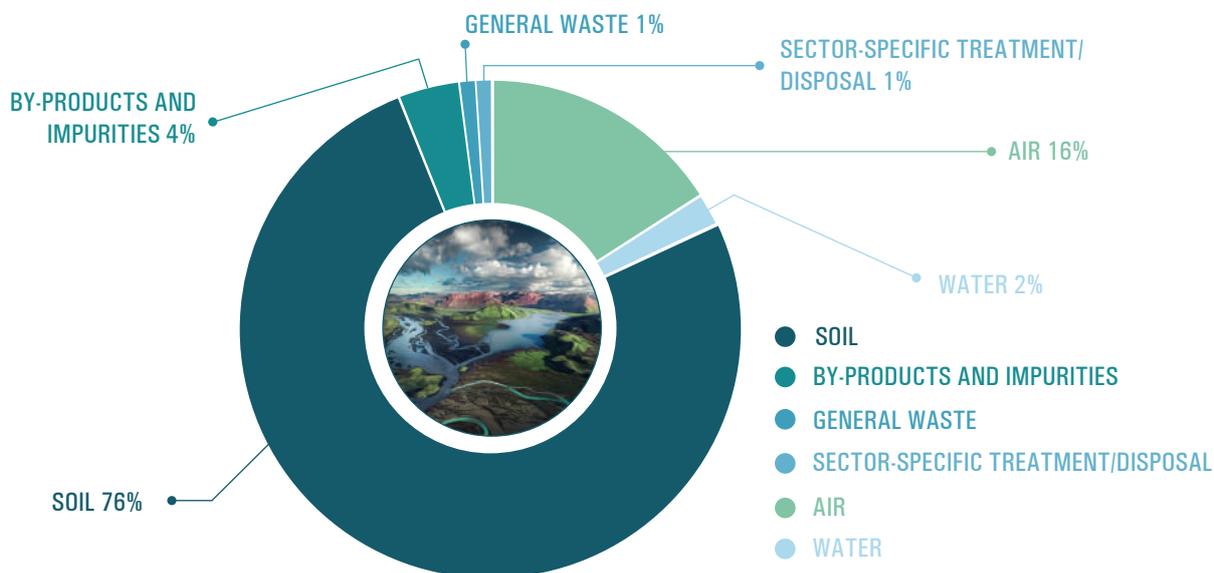


Figure 5. Mercury output pathways

4.3.1. EXTRACTION AND USE OF FUELS/ENERGY SOURCES

Main source category “Extraction and use of fuels and energy sources” include the following sub-categories:

- Coal combustion in large power plants, with thermal boiler capacity above 300MW;
- Other coal combustion, such as smaller combustion plants, domestic heating and other coal uses;
- Extraction, refining and use of mineral oil, i.e. all mercury releases in the life-cycle of mineral oil), such as heating, power production, use in transportation, synthesis of chemicals and

polymers, carbon black production, etc.;

- Extraction, refining and use of natural gas, i.e. all mercury releases in the life-cycle of natural gas), such as heating, power production, use in transportation, synthesis of chemicals and polymers, carbon black production, etc.;
- Extraction and use of other fossil fuels, such as oil shale, peat, etc.;
- Biomass fired power and heat production, using wood, straw, etc.;
- Geothermal power production.

1/ COAL COMBUSTION IN LARGE POWER PLANTS

Mercury contents of coals and lignite were determined in the laboratory of Mining and Petroleum products by using a mercury analyser Hydro-C of Teledyne

Tekmar brand results show the mercury content was 0.054 - 0.383 g/t. The world average of mercury content in coal is 0.17 g/t within range of 0.046-0.67 mg/kg (12).

Table 6. Mercury contents of coals used in fuel and energy sector of Mongolia

Coal name	Coal type	Hg content, g Hg/t
Baganuur	Lignite (brown) coal	0.056
Aduunchuluun	Lignite (brown) coal	0.168
Shivee ovoo	Lignite (brown) coal	0.383
Alag tolgoi	Sub-bituminous (brown) coal	0.065
Nalaikh	Sub-bituminous (brown) coal	0.054
Mogoin gol	Bituminous (hard) coal	0.115
Hotgor	Bituminous (hard) coal	0.142
Tavantolgoi	Bituminous (hard) coal	0.145

Large power plants with capacity above 300MW include Power Plants 2, 3 and 4 in Ulaanbaatar and Dornod Thermal Power Plant and used 2017

data in activity rates with actual content of mercury in the coal uses, considering pollution abatement system used.

2/ OTHER COAL COMBUSTION

This sub-category included 8 power and thermal plants in Ulaanbaatar and other provinces activity rates of 2017 were used in the estimation.

Other coal combustion or smaller

combustion plants and domestic heating were quantified using the coal volume other than those which used in large power plants and cement plants, i.e. total coal usage minus large scale uses.

3/ MINERAL OILS - EXTRACTION, REFINING AND USE

Mongolia imported 1,499,100 tons of petroleum products in 2017. From this amount was subtracted total amount of road asphalt, lubricating oils, motor oils and heavy oils. So total amount of gasoline, diesel fuel, kerosene and aviation fuel equals to 1,301,716 tons, which was used for calculation of the activity rate. Total amount of heavy oil combusted in oil combustion facilities or in large power plants were provided from

the Ministry of Energy. It was equal to 2,406 tons in 2017. The sum of above two is 1,304,122 tons.

The provided information showed that Mongolia produced 7,624,055 barrel of petroleum in 2017. This amount was converted to ton by ratio; 1 metric ton equals to 7.33 barrel. So total amount of petroleum produced in Mongolia in 2017 is 1,040,116.6 tons.

4/ BIOMASS FIRED POWER AND HEAT PRODUCTION

The amount of biomass utilized for power and heat generation in Mongolia was calculated by using data obtained from International Energy Agency website. Mongolia has consumed in 2015 the biomass with gross heat value

of 6003 TJ. Total weight of biomass was calculated as following;

1 ton of dry wood with 20% of air dry moisture has 0.015 TJ calorific value, so dividing 6003 TJ to 0.015 gives 400,200 tons of biomass.

Table 7. Mercury releases from Extraction and use of fuels/energy sources

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Coal combustion in large power plants	Coal t/y	6,425,500	0.06–0.38	1,027.4	–	–	–	–	45.8
Coal combustion in coal fired industrial boilers	Coal t/y	324,200	0.1–0.15	24.7	–	–	–	–	10.0
Other coal use	Coal t/y	1,653,033	0.15	247.95	–	–	–	–	–
Mineral oils use	Oil t/y	1,304,122	0.0034	2.65	–	–	–	–	–
Mineral oils extraction		1,040,116.6	0.002	0.04	0.71	–	–	–	–
Biomass fired power and heat production	Bio-mass t/y	400,200	0.03	12.01	–	–	–	–	–
Sub-total				1,314.7	0.71				55.8
TOTAL				1,371.2					

4.3.2. PRIMARY (VIRGIN) METAL PRODUCTION

This category covers the following main sub-categories:

- Primary extraction and processing of mercury, i.e. dedicated primary mercury mining;
- Gold and silver extraction with the mercury-amalgamation process, i.e. mercury is used intentionally to extract gold and silver, as opposed to other gold and silver extraction

processes;

- Zinc extraction and initial processing, i.e. primary zinc extraction and processing where mercury impurities are present in the ores;
- Copper extraction and initial processing, i.e. primary copper extraction and processing where mercury impurities are present in the ores;
- Lead extraction and initial processing, i.e.

primary lead extraction and processing where mercury impurities are present in the ores;

- Gold extraction and initial processing by other processes than mercury amalgamation, where mercury is present as a natural impurity in gold ore;

- Aluminium extraction and initial processing, i.e. primary aluminium extraction and processing

where mercury impurities are present in the ores or other feedstock materials;

- Extraction and processing of other non-ferrous metals, i.e. primary extraction and processing of other non-ferrous metals, such as nickel and others;

- Primary ferrous metal production, such as production of iron, steel, ferromanganese, etc.

1/ PRIMARY EXTRACTION AND PROCESSING OF MERCURY

No mercury mining exist in Mongolia.

2/ GOLD AND SILVER EXTRACTION WITH THE MERCURY-AMALGAMATION PROCESS

Mercury is banned from use in extraction and processing of minerals and there is no mining activity that use mercury in processing ore. Only ASGM-

ers allegedly use mercury in small amount and thus it was not included in this inventory.

3/ ZINC EXTRACTION AND INITIAL PROCESSING

In Mongolia, zinc ore is processed to zinc concentrate and exported to China by a single company. It's considered that mercury is contained in the product i.e. in the concentrate and since there's

no zinc concentrate processing activity in Mongolia, it's not included in the estimation.

4/ COPPER EXTRACTION AND INITIAL PROCESSING

Two large mines produce copper concentrate by floatation method in Mongolia; Erdenet Mining Corp. and Oyu-Tolgoi LLC and both export. It's considered that mercury is contained in product or the concentrate and there are primary copper smelters in the country, therefore not included in the calculation.

During the inventory work, two samples of copper concentrate from these mines were sent to the specialized laboratory for analysis. The obtained mercury contents were very low (5.8g Hg/t and 5.3g Hg/t respectively) compared with Toolkit default input factors.

As mentioned above, there are no

primary copper smelters in Mongolia. But two companies (Achit Ikht LLD, Erdmin LLD) produce copper cathode from low-grade ore piles of Erdenet open pit mine by acidified solution. Total production of copper cathode from low-grade ore piles (Cu content is app. 0.3%)

was 15,010 tonnes in 2016 (ref. Copper market study 2017, Mongolian Economic research institute). So activity rate can be calculated as 5,420,277 tonnes of low-grade ore piles or mining waste.

5/ GOLD EXTRACTION AND INITIAL PROCESSING BY OTHER PROCESSES THAN MERCURY AMALGAMATION

Gold is extracted from the ore of lode deposit by using cyanide in Mongolia. However it is extracted from the gold containing sand of the placer mine using gravitation methods. There was no reliable information described in the literature for the mercury contents of Mongolian gold ore, so samples collected from major hard-rock mines for mercury content. The average mercury content was 1.47 g/t withing ranges of 0.008-

4.38 g/t,.

An average volume of produced gold in 2013-2017 was used for the activity rate. Results obtained by determination of mercury content in Mongolian gold ore were used as Input factors. Total activity rate for quantification was 53,856,613 tonnes, with 6,606,881 tonnes of ore from lode mine and 47,249,732 tonnes of sand treated.

Table 8. Mercury releases from Primary (virgin) metal production

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Copper extraction and initial processing	Waste t/y	5,420,277	2	9,756.5					1,084.1
Gold extraction and initial processing by other processes than mercury amalgamation	Gold ore and sand t/y	53,856,613	1.47	3,166.8	1,583.4	71,252.3	3,166.8	-	-
Sub-Total				12,923.3	1,583.4	71,252.3	3,166.8		1,084.1
TOTAL				90,009.8					

4.3.3. PRODUCTION OF OTHER MINERALS AND MATERIALS WITH MERCURY IMPURITIES

This category covers the following main sub-categories:

- Cement production, including mercury in lime, waste as fuel and other feedstock materials;
- Pulp and paper production, including mercury impurities in wood, other fuels and

caustic soda, and in some cases mercury-based slimicides;

- Production and processing of other raw materials, including production and use of lime, light weight aggregates, mineral fertilisers, and others.

1/ CEMENT PRODUCTION

There are 5 companies, namely, Erel LLC, Khutul Cement LLC, Munkhiin Bayan Gal LLC, Nalgar Tushig LLC and MAK LLC produce Portland cement in Mongolia. These factories use electrostatic and fabric filters. Lignite is used at the cement plants to generate heat for the kilns processes.

There was found no information about mercury contents of Mongolian cement. Nine samples obtained from

above factories have been sent to the laboratory for analysis of mercury content. Results show that mercury content in limestone was 27.2-54.0 mg/t, gypsum 0.7-16.0 mg/t and in cement 15.1-650.0 mg/t. Because of large difference in the results, it was decided to use the Toolkit default input factor.

An average volume of produced cement in 2013-2017 was used for the activity rate.

2/ PULP AND PAPER PRODUCTION

In Mongolia paper from biomass is not produced.

3/ LIME PRODUCTION

An average volume of produced lime in 2013-2017 was used for the activity rate.

Table 9. Mercury releases from other minerals and materials with mercury impurities

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Cement production	Cement produced t/y	598,628.3	0.6	221.61			73.87		73.87
Lime production	Lime produce t/y	51,480.6	0.11	0.23	-	-	1.13	-	4.30
Sub-total				221.8			75.0		78.2
TOTAL				375.0					

4.3.4. CONSUMER PRODUCTS WITH INTENTIONAL USE OF MERCURY

This category covers the following main sub-categories given below.

- Thermometers containing mercury, including medical thermometers, other glass thermometers (used in laboratories, for educational purposes, etc.) and other mercury thermometers (industrial, marine diesel engines, etc.);

- Electrical and electronic switches, contacts and relays with mercury, including:

- Level switches in sewer pumps, water pumps, car boot lids (lighting), car ABS sensors, car ride-control systems, freezers lids, fall alarms for the elderly, railway signals, lights in children's shoes, etc.,

- Multiple pole level switches in excavation machines,

- mercury-wetted contacts (in electronics),
- Data transmission relays or "reed relays",
- Thermo-switches, etc.;

- Light sources with mercury, including:

- Linear fluorescent lamps,
- Compact bulbs (small energy saving fluorescent lamps),

- Street advertisement with fluorescent tubes,

- Other mercury-containing lamps (Hg-lamps and Na-lamps for street lighting, UV lamps for skin tanning, light source in LCD flat screens for TV and computers, laboratory atomic absorption spectrometry lamps, head lamps in some car brands, etc.);

- Batteries containing mercury, including:
 - Mercury oxide batteries (cylindrical and button),

- Alkaline cylindrical cells (containing mercury),
- Button shaped cells of most types (containing mercury);

- Biocides and pesticides, including seed dressing, sugar cane seedling dip and other pesticides;

- Paints, including some latex paints and possibly other paints containing mercury compounds as biocides for shelf life preservation;
- Pharmaceuticals for human and veterinary uses, including vaccines, eye drops, some herbal medicines, disinfectants, etc.;

- Cosmetics and related products, including skin lightening creams and soaps, preservation in eye cosmetics, etc.

1/ THERMOMETERS WITH MERCURY

The information for this sub category has been obtained from the UN website www.comtrade.org.un. In this information, imported volumes of thermometers with mercury from 2013 to 2016 in Mongolia

were provided.

An average volume of thermometers (HS code 902511) was used for the activity rate.

2/ ELECTRICAL SWITCHES AND RELAYS WITH MERCURY

Mercury switches and relays are mostly used inside other equipment, and it is therefore very demanding to make a detailed assessment for them. Therefore, default Toolkit calculations were used for

their estimation, based on population, electrification rate and experience data from other countries derived from the literature.

3/ LIGHT SOURCES WITH MERCURY

The information for this sub category has been obtained the UN website www.comtrade.org.un. In this information,

imported volumes of light sources with mercury from 2013 to 2018 in Mongolia were provided.

Table 10. Light sources with mercury imported in 2013-2018

HS code	Types	Activity rate of light sources (2013–2018) in use per year
320420	Fluorescent tubes (double end)	94271
853931	Compact fluorescent lamp (CFL single end)	30100
853932	Metal halide lamps	2293
853949	UV light for tanning	113431

4/ BATTERIES WITH MERCURY

During the inventory, 6 batteries were analysed for mercury content. Analytical results showed that the imported batteries may contain from very low to large amount of mercury, 0.0069-0.4 mg/kg, however, all the batteries, except one (Ponennie mentioned the content of 0.025% Hg), stated no mercury

contained. It would have been inadequate to use this analytical data in the inventory calculation as the batteries represent only a small portion on the market and only 1 battery from each 6 manufacturers was tested. This test is proof that batteries do contain mercury and should be handled appropriately.



Figure 6. Batteries analysed

The information for this sub category has been obtained from the UN website www.comtrade.org.un [23].

In this information, imported volumes of batteries with mercury from 2013 to 2016 in Mongolia were provided.

Table 11. Mercury containing batteries imported to Mongolia in 2013-2016

HS code	Battery type	Average activity rate (2013–2016) tons
8506	All cells and batteries; except 850640 and 850660 codes	129.014
850640	silver oxide	0.0065
850660	air-zinc	0.20225

5/ PHARMACEUTICALS FOR HUMAN AND VETERINARY USES

The information for this sub category has been obtained from the National Centre for Public Health of the Ministry of Health. But by this information was

not possible to calculate the releases of mercury caused by consumption of pharmaceuticals for human and veterinary uses.

6/ POLYURETHANE WITH MERCURY CATALYSTS

Mercury emissions from the usage and disposal of polyurethane with mercury catalysts was calculated using the default factors per capita.

Table 12. Mercury released from consumer products with intentional use of mercury

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Thermometers with mercury	pcs/year	12,448	3.5 g Hg /pc	4.36	13.07			26.14	
Electrical switches and relays with mercury	Number of population	3,177,899	0,14 g Hg/capita	44.49		44.49		355.92	
Light sources with mercury	pcs/year	240,095	10-25 g Hg /pcsr	1.32		1.32		1.77	
Batteries with mercury	use, t/year	129.22	Zinc-Air – 12, Silver oxide – 4, Alkaline – 0.25 kg Hg/t	8.68		8.68		17.35	
Polyurethane with mercury catalysts	Number of population	3,177,899	0.03 g Hg/capita	11.44	5.72	7.63		70.55	
Sub-total				70.3	18.8	62.1		471.7	-
TOTAL				622.93					

4.3.5. OTHER INTENTIONAL PRODUCT/PROCESS USES

This category covers the following main sub-categories given below. It includes releases from production, use and disposal.

- Dental amalgam fillings,
- Manometers and blood pressure gauges,

- Laboratory chemicals and equipment,
- Ethnic/cultural/ritualistic uses,
- Other mercury metal uses.

1/ DENTAL AMALGAM FILLINGS

Purchase of mercury-added medical instruments, including dental amalgam, was banned by the joint order 07/27

of 2011 by the Minister and Health and the Chief of National Emergency Management Authority.

2/ MANOMETERS AND BLOOD PRESSURE GAUGES WITH MERCURY

It is very difficult to quantify the amount of imports at the customs facilities, as the records for customs clearance do not reflect products whether they contain mercury or not, and thus making the calculation of the amount of mercury difficult. It is also difficult to determine the amount of mercury in devices in use, as they are in closed use and usually there is no label showing the amount. Estimating the number of products and devices out

of use is another problem and again, hard to calculate in terms of potential emissions. Blood pressure gauges were not quantified in this study. Improving the inventory for manometers and gauges containing mercury requires very detailed data collection that has not been possible in this study. For the calculations were used default Input factor provided in the Inventory Level 2 spreadsheet.

3/ LABORATORY CHEMICALS AND EQUIPMENT

Mercury and mercury compounds are listed as restricted toxic and hazardous chemicals. Ministry of Environment and Tourism issues license for import and use of restricted chemicals based on the conclusions by the National Council of Toxic and Hazardous Chemicals Policy Coordination. No license had been issued during the inventory period for import and use of mercury and mercury compounds.

National Agency for Meteorology and Environmental Monitoring uses mercury oxide (HgO) in testing sulphur dioxide in ambient air with MNS 17.2.5.12:88 standard.

As for the laboratory chemicals and equipment containing mercury in a closed form, it is very difficult to quantify the amount of imports and exports at the customs facilities, as the records

for customs clearance do not reflect products whether they contain mercury or not, and thus making the calculation of the amount of mercury difficult. It is also difficult to determine the amount of mercury in devices in use, as they are in closed use and usually there is no

label showing the amount. Therefore, default Toolkit calculations were used for their estimation, based on population, electrification rate and experience data from other countries derived from the literature.

Table 13. Mercury releases from Other intentional product/process uses

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Manometers and gauges with mercury	Number of population	3,177,899	0.005	1.91	4.77	0.64		8.58	
Laboratory chemicals and equipment	Number of population	3,177,899	0.04		52.4			52.4	54.0
Sub-total				1.91	57.17	0.64		60.98	54.0
TOTAL				174.7					

4.3.6. PRODUCTION OF RECYCLED METALS

This category covers the following main sub-categories:

- Production of recycled mercury (“secondary” metal production), including the collection and processing involved in recycling of mercury;

- Production of recycled ferrous metals (iron and steel), including the collection and processing involved in recycling of iron and steel (such as scrap yard handling, scrap auto smelting, shredder, re-melting furnace).
- Production of other recycled metals

1/ PRODUCTION OF RECYCLED FERROUS METALS (IRON AND STEEL)

The Darkhan Metallurgical Plant (DMP) has provided information [29] for this sub-category upon on request. In the information were included consumption volumes of recycled ferrous metals in the

plant 2013-2017 years. For the activity rate were used average data from 2013 to 2017. For the calculations were used default Input factors provided in the inventory Level 2 spreadsheet.

Table 14. Mercury release from Production of recycled ferrous metals

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Production of recycled ferrous metals (iron and steel)	Iron t/y	38,546.2	1.1	13.99		14.42		13.99	
TOTAL				42.4					

4.3.7. WASTE INCINERATION AND BURNING

This category covers the following main sub-categories:

- Incineration of municipal/general waste;
- Incineration of hazardous waste;
- Incineration of medical waste;
- Sewage sludge incineration;
- Informal waste burning.

1/ INCINERATION OF MEDICAL WASTE

There are no incinerators existing except for medical wastes in Mongolia.

In Ulaanbaatar, at present only one company Element Company collects all medical wastes from hospitals, clinics, and health centers and 935 tones of medical wastes per year are autoclaved for landfill.

In provinces, medical waste is

incinerated. Approximately, 1061 tones of medical waste is incinerated per annum. Medical waste incinerators are used in most of the provinces and are basically hand-made and simple in design. These incinerators are described as specifically designed; however, practically all of them have no APC installed.

2/ INFORMAL WASTE BURNING

About 2.5 million tonnes of solid waste generated nationwide was collected and buried at 387 dump sites and landfill in 2017. Uncontrolled open burning occurs at dumpsites due to activities by scavengers or from hot ashes and gases produced by wastes and it is

impossible to quantify the amount of wastes burnt. So, it was decided about 10% of these waste is burned open and calculated in this inventory.

Table 15. Mercury releases from informal waste burning

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Incineration of medical waste	Incinerated waste t/y	1061	24	16.55				8.91	
Informal waste burning	Burnt waste t/y	248,074	1	248.07					
TOTAL				25.46					

4.3.8. WASTE DEPOSITION/LANDFILLING AND WASTE WATER TREATMENT

This category covers the following main sub-categories:

- Controlled landfills/deposits;
- Diffuse deposition under some control;
- Informal local deposition of industrial

production waste;

- Informal dumping of waste;
- Waste water system/treatment.

1/ CONTROLLED LANDFILLS/DEPOSITS

Total volume of wastes generated nationwide in 2013-2017 was used as activity rate in this calculation.

2/ WASTE WATER SYSTEM/TREATMENT

Central Sewage Treatment Facility in Ulaanbaatar treated 61,152,300 m³ household and industrial sewage and waste water in 2017 by mechanical and biological methods. Six other smaller treatment facilities operate in

Ulaanbaatar, where treated 1,368,400 m³ sewage and waste water.

In provinces, 133 waste water treatment facilities registered with annual treatment of 24,541,500 m³.

Table 16. Mercury releases from Landfills, deposits and waste water system

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Controlled landfills/deposits	Buried waste t/y	2,232,670	1	223.27	223.27	1,786.14			
Waste water system/treatment	Waste water m ³ /y	87,062,200	2,25		97.94			58.77	39.18
Sub-total				223.3	321.2	1,786.1		58.8	39.2
TOTAL				2,428.6					

4.3.9. CREMATORIA AND CEMETERIES

This category covers the following main sub-categories:

- Crematoria;
- Cemeteries.

1/ CREMATORIA

There are 2 companies offering crematoria service in Ulaanbaatar and used 2013-2017 data of cremation as activity rate.

2/ CEMETERIES

For the activity rate were used average data from 2013 to 2017.

Table 17. Mercury releases from crematoria and cemeteries

Sub-Category	Unit	Activity Rate	Hg Input Factor, g/t	Calculated Hg output, Kg/y					
				Air	Water	Soil	By-products	Waste	Sector-specific treatment
Crematoria	Corpses cremated/year	2,061	2.5	5.15					
Cemeteries	Corpses buried/year	15,241	2.5			38.10			
Sub-total				5.15		38.10			
TOTAL				43.3					

4.3.10. CONTAMINATED SITES

The first ever usage of mercury in production known officially today is a joint German-Chinese-Mongolian venture “Mongolor”, which started using mercury since 1913 for gold extraction. They operated in the Boroo river basin, today’s Mandal village in Selenge province. A big crack in the amalgamating tank in 1956 released a big amount of mercury to the river basin and formed a big deposit of mercury. A research for mercury contamination made in 2003 with support from the Japanese International Cooperation Agency (JICA) in the river basin area revealed that the production’s ruins was most exposed to the pollution (mercury concentration was 177mg/kg or 89 times than the limit) (14).

Another project, “Research of Pollution from Gold Ore Extraction in Selenge Basin”, implemented by the Ministry of Environment of Czech Republic studied mercury contamination in the soil and sediment along the river and revealed in 2006 that contamination was higher around the boiler crack area. Only the free metal mercury was 1.8 – 69.5 g/m³. Samples of vegetables grown along the Boroo basin and fish from the river showed excessive amount of mercury, as well (15).

Since the 1990s, when the country transited to the market economy system, the industrial sector and community based entities collapsed which subsequently resulted in massive unemployment and deterioration of subsistence level. The situation led to the emergence of big groups of illegal artisanal miners, nicknamed “ninja” miners. The “ninjas” operated in placer mines and hard rock deposits of gold and illegally used mercury and cyanide, extensively polluting environment. Mercury illegally used by

these miners has been coming from 2 sources, illegal import and the mercury collected from the aforementioned Boroo river basin.

The Government of Mongolia organized a nationwide inspection of individuals and businesses which use chemicals in their operation, twice in 2007-2008. As a result of the inspections, it was revealed that about 200,000 tons of tailings in 120 sites in the territory of 10 provinces, covering 53 hectares of area and polluting dozens of groundwater wells. Also, stopped the operation of 145 ASGM mills, which used mercury (16).

The Government spent 3.8 billion MNT (Approx. US\$ 2.6 million) for the activity in 2008-2009 for cleaning out the contamination to protect human health and the environment from harmful effects of mercury. As a result of the massive work, 197,687 tons of tailings from 230 sites in the territory of 9 provinces was transported to 6 sites for designated landfilling and up to 128,444 m² areas were cleaned. For mercury pollution in the Boroo river basin, caused by the accident, several site investigations and remediation occurred in 2009 and 2015. A total of 105 kg of mercury were collected from the river and 19,868 tons of contaminated soil and sediment from the river was buried in landfills. A 10,245 m² area was neutralized and technical rehabilitation works were done at the site (16).

During this inventory, in Mongolia no other hot-spots of mercury contamination have been identified.

4.3.11. STOCKS OF MERCURY/MERCURY COMPOUNDS AND STORAGE CONDITIONS

The Government of Mongolia organized a nationwide inspection of individuals and businesses which use chemicals in their operation, twice in 2007-2008 with the concerted action by the Ministry of Environment and Tourism, National Emergency Management Agency, State Specialized Inspection Agency, Ministry of Industry and Trade and General Police Authority and stopped operation of 145 mills that use mercury in gold processing. As result of this action, 35 kg of element mercury and 1,200 kg cyanide was confiscated. As result

of confiscation and paid information campaign for illegal mercury use and storage, over 120 kg of mercury was collected.

Interim storage of mercury with a special container of 1 ton capacity was built in 2015 and stored the confiscated mercury together with mercury compounds collected during the national obsolete chemicals inventory, conducted in 2014. For the time being, over 300 kg liquid mercury and 18 kg mercury compounds are being stored in the place.

4.3.12. IMPACTS OF MERCURY ON HUMAN HEALTH AND THE ENVIRONMENT

International experts from WHO, UN FAO, UNEP, Swiss and Japanese Governments worked in Khongor village of Darkhan-Uul province after mercury and cyanide accident in 2007. First time in Mongolia, these international experts also conducted medical inspections and analyses among the residents of some settlements and areas where operation of ore processing, using mercury had been wide spread. Analyses of urine samples taken from residents

of Talbulag settlement in Bornuur and Jargalant villages, Tuv province. Out of 96 urine samples, mercury level was detected at greater level than Category I of Human bio-monitoring value in 20 samples (greater than 7 mg/l) and greater level than Category II in 3 samples (greater than 25 mg/l).

No extensive health impact surveys or research has been done in the country.





POLICY, REGULATORY AND INSTITUTIONAL FRAMEWORK ASSESSMENT



Mongolia signed the Minamata Convention on Mercury in 2013 and the Parliament ratified it in 2015. The objective of the Minamata Convention is to protect the human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.

Parties to the convention are obliged to take additional measures to meet the objectives set forth in by the convention and this assessment was made to evaluate the current regulatory coordination in force in the country in line with the successful implementation of the convention. Convention's every articles and provisions, relevant to Mongolian condition, had been assessed in context of Mongolia and recommendations for necessary actions made for the improvement the legal framework.

5.1 ASSESSMENT OF MERCURY REGULATIONS

The Law on Toxic & Hazardous Chemicals, revised in 2006 by the Parliament of Mongolia, regulates export, import, transboundary movement, production, storage, trade, transport, use, disposal and control of toxic and hazardous chemicals.

This law authorizes the state central administrative body in charge of environmental affairs (Ministry of Environment) to coordinate activities related to toxic and hazardous chemicals and enforce regulations.

Cross-sectoral coordination is managed by the National Chemicals Management and Policy Coordination Council, which is chaired by the Minister of Environment and with the Ministry's

officer in charge of chemicals is responsible for secretarial tasks. Experts group consisting of officers and workers from related stakeholders, including ministries, research institutions, universities, works under the Council. It has affiliates in aimag provinces and the Capital city.

Chemical substance, under the Law on Toxic & Hazardous Chemicals, are classified as "toxic" and "hazardous" based on properties and impacts to human and environmental health. According to classification in joint order A/356/396 by the Minister of Environment and Minister of Health of 2015, mercury and its compounds are classified as shown in below Table.

Table 18. Classification of mercury and mercury compounds

Chemical name	CAS Registry Number	Classification
Mercury	7439-97-6	Toxic 3 Specific target organ toxicity – repeated exposure 2 Acute aquatic toxicity 1 Chronic aquatic toxicity 1
Mercuric chloride	10112-91-1	Toxic 4 Irritant, causes eye burns 2 Toxic to organs through single exposure 3 Causes skin burns 2 Acute aquatic toxicity 1 Chronic aquatic toxicity 1
Organic mercury compounds		Toxic 1 Toxic to certain organs through repeated exposure 2 Acute aquatic toxicity 1 Chronic aquatic toxicity 1
Mercury difulminate	628-86-4	Unstable and self explodes Toxic 3 Toxic to certain organs through repeated exposure 2 Acute aquatic toxicity 1 Chronic aquatic toxicity 1

Mercury – oxicyanide	1335-31-5	Explosive 1.1 Toxic 3 Toxic to certain organs through repeated exposure 2 Acute aquatic toxicity 1 Chronic aquatic toxicity 1
Dimethylmercury	593-74-8, 627-44-1	Toxic 1 Toxic to certain organs through repeated exposure 2 Acute aquatic toxicity 1 Chronic aquatic toxicity 1
Phenylmercury nitrate; Phenylmercury hydroxide; Phenylmercury nitrate basic	55-68-5, 100-57-2 8003-05-2	Toxic 3 Toxic to certain organs through repeated exposure 2 Skin irritation 1B Acute aquatic toxicity 1 Chronic aquatic toxicity 1
2-methoxyethyl- mercury chloride	123-88-6	Toxic 3 Toxic to certain organs through repeated exposure 1 Skin irritation 1B Acute aquatic toxicity 1 Chronic aquatic toxicity 1
Mercury dichloride; Mercury chloride	7487-94-7	Toxic 2 Toxic to certain organs through repeated exposure 1 Skin irritation 1B Acute aquatic toxicity 1 Chronic aquatic toxicity 1
Phenylmercuric acetate	62-38-4	Toxic 3 Toxic to certain organs through repeated exposure 1 Skin irritation 1B Acute aquatic toxicity 1 Chronic aquatic toxicity 1

The Government approves the list of toxic and hazardous chemicals banned and restricted use in Mongolia and mercury and its organic and inorganic compounds were listed in 2007 by Order 95.

Minamata Convention on Mercury covers mercury and compounds in waste products, as well as wastes contaminated with mercury and these shall be regulated by the Mongolian Law on Waste. The law stipulates rights and duties of central and local government organizations, businesses and individuals and dictated a supernumerary or non-vacant experts council works under the state central administrative body in charge of environment for conclusions and recommendations on waste issues. The law

also provided coordination on hazardous waste packaging, temporary storage, transport, disposal and recycling operations with requirements for the operators, registration, permitting, monitoring and reporting.

As classified by the law, “hazardous waste” category covers mercury containing/contaminated wastes, and “products containing hazardous parts” cover electric and electronic appliances, equipments and tools.

List of waste by source codes and their classification, 2017 A/349, and List of Waste, 2018, was approved by the Minister of Environment and the Government, respectively.

Table 19. List of wastes that contain and potentially contain mercury

Codes	Waste	Hazard
02 01 07*	Agrochemical waste containing dangerous substances	X
16 01 05*	Mercury containing parts of end-of-life vehicles	X
16 02 05*	Discarded EEE wastes containing toxic substances (such as batteries, switches containing mercury, cathode lamps)	X
16 05 03*	Laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals	X
16 05 04*	Discarded inorganic chemicals consisting of or containing dangerous substances	X
16 05 05*	Discarded organic chemicals consisting of or containing dangerous substances	X
16 06 03*	Mercury containing batteries	A
17 08 01*	Construction and demolition wastes containing mercury	X
18 01 05*	Wastes containing chemicals consisting of or containing dangerous substances from human health care	X
18 01 09*	Amalgam wastes from dental care	A
18 02 04*	Wastes containing chemicals consisting of or containing dangerous substances from animal health care	X
20 01 10*	Pesticides	A
20 01 11	Fluorescent tubes and other mercury-containing waste	A
20 01 23*	Discarded EEEs	X
20 01 29*	Fly ash and other flue gas treatment wastes	X

Following mercury containing wastes potentially be produced from processes and activities in Mongolia.

Table 20. Mercury contaminated and mercury containing wastes

Sub-group	Codes	Waste	Hazard
Wastes from power stations and other combustion plants (excluding waste incinerators)	10 01 01	Bottom ash, slag and boiler dust (excluding those mentioned in 10 01 04)	X
	10 01 02	Coal fly ash	X
	10 01 04*	Oil fly ash and boiler dust	A
	10 01 05	Calcium-based reaction wastes from flue gas desulphurisation in solid form	
	10 01 06	Calcium-based reaction wastes from flue gas desulphurisation in sludge form	
	10 01 13*	Wastes from gas treatment containing dangerous substances	X
	10 01 15*	Sludges from effluent treatment containing dangerous substances	X
Wastes from iron and steel industry	10 02 03*	Solid wastes from gas treatment containing dangerous substances	X
	10 02 08*	Sludges and filter cakes from gas treatment containing dangerous substances	X
	10 04 99	Wastes not otherwise specified	

Wastes from manufacture of cement, lime and plaster	10 13 08*	Solid wastes from gas treatment containing dangerous substances	X
Waste from crematoria	10 14 01*	Waste from gas cleaning containing mercury	X
Wastes from waste water treatment plants not otherwise specified	19 08 09*	Sludges containing dangerous substances from biological treatment of industrial waste water	X
	19 08 11*	Sludges containing dangerous substances from other treatment of industrial waste water	X
Wastes from soil and groundwater remediation	19 13 01*	Solid wastes from soil remediation containing dangerous substances	X
	19 13 03*	Sludges from soil remediation containing dangerous	X
	19 13 05*	Sludges from groundwater remediation containing dangerous	X
Municipal wastes	20 01 29*	Bottom ash and wastes from chimney sweeping	X

Table below shows wastes from mining and processing that may contain mercury. Conference of the Parties to Minamata Convention shall

define mercury threshold in minerals ore and waste rocks and tailings from mining.

Table 21. Wastes from mining and processing that may contain mercury

Sub-group	Codes	Waste	Hazard
Wastes from mineral excavation	01 01 01	Wastes from mineral metalliferous excavation	
	01 01 02	Wastes from mineral non-metalliferous excavation	
Wastes from physical and chemical processing of metalliferous minerals	01 02 01*	Acid generating tailings from processing of sulphide ore	A
	01 02 02*	Other tailings containing dangerous substances	X
	01 02 04*	Wastes containing dangerous substances from physical and chemical processing of metalliferous minerals	X
	01 02 06	Red mud from alumina production	
Wastes from physical and chemical processing of non-metalliferous minerals	01 03 01*	Wastes containing dangerous substances from physical and chemical processing of non-metalliferous minerals	X

As seen from the tables, wastes with marks "A" in hazard level shall be considered as hazardous waste and handled in accordance with hazardous waste regulations.

Wastes with hazard mark "X" are required

to be analysed in laboratory for determination of the hazard and if the analysis report shows values above threshold, it shall be handled as hazardous waste, in other case as general waste.

5.2 ASSESSMENT OF REGULATIONS IN RELATION TO THE MINAMATA CONVENTION PROVISIONS

ARTICLE 3. MERCURY SUPPLY SOURCES AND TRADE

5 (a) Endeavour to identify individual stocks of mercury or mercury compounds exceeding 50 metric tons, as well as sources of mercury supply generating stocks exceeding 10 metric tons per year, that are located within its territory;

The Minerals Law governs exploration, mining and use of minerals and protection of exploration sites and mining sites. State central administrative body in charge of geology and mining affairs issues exploration and mining licenses for all types of mineral resources except

common minerals. This law has no provision whatsoever to ban mining of mercury deposits.

Mineral Resources Information Technology Center under the Mineral Resources and Petroleum Authority maintains data on geology and mineral resources.

6. (a) To a Party that has provided the exporting Party with its written consent, and only for the purpose of:

(I) A use allowed to the importing Party under this Convention; or

(II) Environmentally sound interim storage as set out in Article 10; or

(b) To a non-Party that has provided the exporting Party with its written consent, including certification demonstrating that:

(I) The non-Party has measures in place to ensure the protection of human health and the environment and to ensure its compliance with the provisions of Articles 10 and 11; and

(II) Such mercury will be used only for a use allowed to a Party under this Convention or for environmentally sound interim storage as set out in Article 10.

In accordance with the Law on Toxic and Hazardous Chemicals and Law on Licensing, export license for toxic and hazardous chemicals shall be issued by the state central administrative organ in charge of environment. Requirements for license provided in “Procedures for export, import, transboundary movement, production and trade of toxic and hazardous chemicals”, approved jointly by the Minister of Environment

and Minister of Foreign Affairs in 2009.

Name, formula, trade and technical name, international registry number shall be clearly stated in application for export license. In addition, agreements and consents in accordance with national and international laws and conventions, as well as agreement with transporters shall be attached to the application.

Mercury and its organic and inorganic

compounds are listed as toxic and hazardous chemicals banned and restricted use in Mongolia, therefore, conclusions and evaluation shall be obtained from the experts group under the National Chemicals Management and Policy Coordination Council before application.

The Government also assigns border ports,

through which toxic and hazardous chemicals transported, and for the time being there are 8 ports, including the main airport in Ulaanbaatar. Customs and specialised inspection agency shall control over chemicals import to country, in accordance with the Mongolian Law on Border.

ARTICLE 4. MERCURY-ADDED PRODUCTS

Each Party shall not allow, by taking appropriate measures, the manufacture, import or export of mercury-added products listed in Part I of Annex A after the phase-out date specified for those products, except where an exclusion is specified in Annex A or the Party has a registered exemption pursuant to Article 6.	
Mercury-added products	Date after which the manufacture, import or export of the product shall not be allowed (phase-out date)
Batteries, except for button zinc silver oxide batteries with a mercury content < 2% and button zinc air batteries with a mercury content < 2%	2020
Switches and relays, except very high accuracy capacitance and loss measurement bridges and high frequency radio frequency switches and relays in monitoring and control instruments with a maximum mercury content of 20 mg per bridge, switch or relay	2020
Compact fluorescent lamps (CFLs) for general lighting purposes that are ≤ 30 watts with a mercury content exceeding 5 mg per lamp burner	2020
Linear fluorescent lamps (LFLs) for general lighting purposes: (a) Triband phosphor < 60watts with a mercury content exceeding 5mg per lamp; (b) Halophosphatephosphor ≤ 40watts with a mercury content exceeding 10mg per lamp	2020
High pressure mercury vapour lamps (HPMV) for general lighting purposes	2020
Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays: (a) short length (≤ 500 mm) with mercury content exceeding 3.5 mg per lamp (b) medium length (> 500 mm and ≤ 1 500 mm) with mercury content exceeding 5 mg per lamp (c) long length (> 1 500 mm) with mercury content exceeding 13 mg per lamp	2020
Cosmetics (with mercury content above 1ppm), including skin lightening soaps and creams, and not including eye area cosmetics where mercury is used as a preservative and no effective and safe substitute preservatives are available1/	2020
Pesticides, biocides and topical antiseptics	2020
The following non-electronic measuring devices except non-electronic measuring devices installed in large-scale equipment or those used for high precision measurement, where no suitable mercury-free alternative is available: (a) barometers; (b) hygrometers; (c) manometers; (d) thermometers; (e) sphygmomanometers.	2020

As stated in the Law on Toxic and Hazardous Chemicals, the list of banned and restricted chemicals shall be approved by the Government, whereas the list of chemicals, which can be used in agriculture for plants protection, veterinary service and hygiene, such as pesticides, chemical fertilizers, insecticides and rodenticides, is renewed annually by a joint order by the Ministers of Environment, Agriculture and Health. The list also sets the thresholds for those chemicals. These lists can only ban import and production of mercury and mercury compounds, but mercury-added products are not covered.

Following lists ban and restrict goods and products to be imported through Mongolian border. These include:

- "List of group of goods banned to import", Resolution #5 by the Parliament, 1998;
- "Coded list of banned goods to import", Resolution #54 by the Government, 2001; and

- "Coded list of goods to be imported with license", Resolution #219 by the Government, 2002.

There is no regulation to ban mercury containing dental amalgam.

The Law on Toxic and Hazardous Chemicals provides that "the state central administrative bodies in charge of environment and health affairs shall jointly approve procedure for registry, collection, transport, storage, disposal, import and export of chemicals listed as banned and restricted", and that being the case, it's possible to approve a procedure on mercury.

The Law on Toxic and Hazardous Chemicals also provided that the member of cabinet in charge of environmental issues shall assign sectors and activities, as well as use limits of chemicals listed as banned and restricted. This provision also gives a possibility to prohibit the sectors to use mercury-added products.

ARTICLE 5. MANUFACTURING PROCESSES IN WHICH MERCURY OR MERCURY COMPOUNDS ARE USED

Manufacturing processes using mercury or mercury compounds as set forth in Annex B, Part I of the convention, namely, chlor-alkali production, acetaldehyde production in which mercury or mercury compounds are used as a catalyst, vinyl chloride monomer production, sodium or potassium methylate or ethylate production, and production of polyurethane using mercury containing catalysts are not existent in Mongolia and there is no regulatory coordination for such productions and processes.

The coordination in place now requires businesses planning to produce chemicals to do feasibility study and environmental impact assessment in accordance with the Law on Environmental Impact Assessment and to approach the state central administrative organ in charge of environment for approval. Ministry

of Environment shall, in accordance with the Law on Toxic and Hazardous Chemicals and Law on Licensing, permit the chemicals production operation based on the conclusion by the National Chemicals Management and Policy Coordination Council.

Businesses, organizations and individuals are obliged to conduct risk analyses pursuant to the Law on Environmental Impact Assessment for the chemicals production process. Procedure for risk assessment is approved by the joint order #28/40/29 in 2009 by the Minister of Environment, Minister of Health and Chairperson of National Emergency Authority.

ARTICLE 7. ARTISANAL AND SMALL-SCALE GOLD MINING

Each Party that has artisanal and small-scale gold mining and processing subject to this Article within its territory shall take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing.

Develop and implement a national action plan in accordance with Annex C;

Actions to eliminate:

- (I) Whole ore amalgamation;
- (II) Open burning of amalgam or processed amalgam;
- (III) Burning of amalgam in residential areas; and
- (IV) Cyanide leaching in sediment, ore or tailings to which mercury has been added without first removing the mercury;

Law of Mongolia on Minerals stated that artisanal and small-scale mining (ASGM) or “micro mining” means activities of citizens organized, in forms of unregistered partnership stipulated in Article 481.1 of the Civil Code, partnership stipulated in Article 35 and cooperative stipulated in Article 36.4 of the Civil Code, for the purpose of exploiting minerals in the areas of economically non-profitable deposit for industrial operation and derivative deposit formed by operational and technological wastes.

Partnership – legal form of business where member individuals share ownership, as well as the responsibility for managing the business and the income or losses the business generates.

Cooperative – business association of persons united voluntarily to meet their common needs through jointly owned enterprise.

Unregistered partnership – a form of partnership where individuals consented to work together on the basis of cooperation agreement. This type of partnership is not obliged to be registered by the state registry and organization

of the partnership is agreed between members.

As regulated by the Minerals Law, licensing is not obligatory for ASGM operation, but ASGM area shall be designated by the state central administrative body in charge of geology and mining. Though, ASGMers are obliged to deliver their gold within the financial year mined.

Resolution #151 was approved by the Government in 2017 on “ASGM procedure” for the purpose of proper exploitation of economically not-profitable deposits and derivative deposits formed by operational and technological wastes, as well as for the protection of environment and increase local employment rate to reduce poverty.

ASGMers are obliged to make tripartite agreement with his/her local soum governor and the holder of mining license, and to make restoration in the exploited field. The local soum governor shall register the ASGMers to issue formal identity and monitor their operations to enforce mining and safety regulations and standards.

This resolution bans the use of toxic and

hazardous chemicals in ASGM and prescribed to process ores mined by ASGMers at designated workshops built in designated areas by the state central administrative body in charge of geology and mining.

Resolution #135 of 2008 by the Minister of Environment bans the use of mercury in minerals mining and processing.

ARTICLE 8. EMISSIONS

3. A Party with relevant sources shall take measures to control emissions and may prepare a national plan setting out the measures to be taken to control emissions and its expected targets, goals and outcomes.

List of point sources of emissions of mercury and mercury compounds to the atmosphere

Point source category:

- Coal-fired power plants;
- Coal-fired industrial boilers;
- Smelting and roasting processes used in the production of non-ferrous metals; ^{1/}
- Waste incineration facilities;
- Cement clinker production facilities.

^{1/} For the purpose of this Annex, "non-ferrous metals" refers to lead, zinc, copper and industrial gold

The Government, as provided in the Law on Air, approved "National Program on Air and Environmental Pollution Reduction" in 2017 by resolution #98.

The following activities for the reduction of mercury emissions and releases are planned to achieve the objectives to reduce pollution sources through environmentally sound advanced techniques and technologies and to reduce pollutants emissions through phasing out coal use. The activities include: to shut down heating boilers in Ulaanbaatar and connect consumers gradually to central and individual engineering grids; to phase out coal use except in power plants and thermal plants; to build hazardous waste temporary storage and disposal facility and deescalate uncontrolled hazardous waste dispersion; to introduce extended producer,

importer and seller responsibility system to take back end-of-use products such as packages, batteries, fluorescent lamps, tires and used oils and encourage and promote recycling operators through economic incentives; and to revise and renew standards for activities and processes that potentially reduce environmental pollution and waste, as well as that introduce environmentally friendly up-to-date techniques and technologies and save resources.

Below table shows indicators (PM2.5, PM10 and sulfur dioxide) and targets for pollutants reduction, as specified in the program.

№	Indicator	Unit	Background level (year)	Target level (year)		Agencies	
			2016	2019	2025		
1	Pollutants reduction (background level as of December 2016 average)	PM2.5	mkg/m ³	256	190	70	MET, UB Governor
		PM10	mkg/m ³	279	210	100	MET, UB Governor
		Sulfur dioxide (SO ₂)	mkg/m ³	89	70	50	MET, UB Governor

4. For its new sources, each Party shall require the use of best available techniques and best environmental practices to control and, where feasible, reduce emissions, as soon as practicable but no later than five years after the date of entry into force of the Convention for that Party. A Party may use emission limit values that are consistent with the application of best available techniques.

Law on Air defines “Air polluting substance” shall mean any source of pollution or any physical, chemical, biological, and radioactive substance and their mixtures being emitted from a source of pollution, and “A major stationary source of air pollution” shall mean any facility established for production, services, or other purposes that emits more than 100 tonnes of pollutants or more than 5 tonnes of hazardous pollutants per annum into the air.

The state central administrative body in charge of environmental affairs have the powers to issue permits and licenses to major stationary facilities that produce air pollution; extend, terminate, and invalidate their duration, and establish the maximum limits of air pollutants to be emitted from the facilities.

Businesses, organizations and individuals, in order to run their operations using major stationary source of air pollution shall have expert decisions and permits from local administration. The permit shall indicate acceptable level of pollutants and their adverse impacts together with necessary measures to reduce air pollution, as well as other regulatory requirements.

Law on Environmental Impact Assessment provides that recommendations for BAT/BEP for the reduction of pollutants shall be suggested in the detailed environmental impact assessment report.



5. For its existing sources, each Party shall include in any national plan, and shall implement, one or more of the following measures, taking into account its national circumstances, and the economic and technical feasibility and affordability of the measures, as soon as practicable but no more than ten years after the date of entry into force of the Convention for it:

- (a) A quantified goal for controlling and, where feasible, reducing emissions from relevant sources;
- (b) Emission limit values for controlling and, where feasible, reducing emissions from relevant sources;
- (c) The use of best available techniques and best environmental practices to control emissions from relevant sources;
- (d) A multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions;
- (e) Alternative measures to reduce emissions from relevant sources.

Law on Air provides that the state central administrative body in charge of environmental affairs shall approve the list of toxic air pollutants, however, this provision has not been realized yet.

Businesses, organizations and individuals, in order to run their operations using major stationary source of air pollution shall have pollution control system.

State central administrative body in charge of environmental affairs shall establish and run the national monitoring network that is to conduct regular monitoring, measurements, observations, and assessments of air quality, negative physical impacts on the air, acidic precipitation, stratospheric ozone, and green house gas contents and provide the public with reports and updates. The monitoring network shall consist of the following units:

- Local unit of international monitoring network;
- National monitoring network;
- Local monitoring network;
- Internal monitoring points with the economic entities and organizations that cause air pollution and negative physical impacts.

The law also urges to develop standards for permissible level of pollutants from household

stoves and for wastes generated by major stationary sources of air pollution.

As stated above, businesses, organizations and individuals, in order to run their operations using major stationary source of air pollution shall have pollution control system and shall be equipped with pollutant neutralization and cleaning system.

/no provision on the reduction of emissions from major stationary sources of air pollution/

Law on Air Pollution Payment requires coal miners, holders of permit for major stationary sources of air pollution and individuals and businesses that use air polluting sources shall pay air pollution payment. State central administrative body in charge of environmental affairs shall approve the list of pollutants emitted from major stationary sources, however, no list was prepared.

Specialized agency shall determine whether the emissions from major sources exceed the standards and in case if the emissions are over the limit, environmental inspectors and local Governors shall enforce corrective actions and impose penalty. The air pollution penalty is 3 times the calculated amount of damages and it was decided to calculate it with every kilogram

of coal mined and emissions released. Amount of payment for air pollution from major stationary sources of air pollution shall be determined by

the Government and shall be 1 – 10 Tugriks per kilogram. However, rate is not fixed yet.

ARTICLE 9. RELEASES

3. Each Party shall, no later than three years after the date of entry into force of the Convention for it and on a regular basis thereafter, identify the relevant point source categories.

4. A Party with relevant sources shall take measures to control releases and may prepare a national plan setting out the measures to be taken to control releases and its expected targets, goals and outcomes. Any plan shall be submitted to the Conference of the Parties within four years of the date of entry into force of the Convention for that Party. If a Party develops an implementation plan in accordance with Article 20, the Party may include in it the plan prepared pursuant to this paragraph.

No regulations on the determination, classification and control of points sources.

5. The measures shall include one or more of the following, as appropriate:

- (a) Release limit values to control and, where feasible, reduce releases from relevant sources;
- (b) The use of best available techniques and best environmental practices to control releases from relevant sources;
- (c) A multi-pollutant control strategy that would deliver co-benefits for control of mercury releases;
- (d) Alternative measures to reduce releases from relevant sources.

Law on Soil Protection and Prevention of Desertification provides that the State central administrative body in charge of environmental affairs shall approve chemicals that pollute soil and their tolerance limit, and for the time being it's not realised, too.

Law on Water urges to have nationwide water quality monitoring network and it shall consist of national monitoring network, water basin monitoring unit, economic entities and organizations unit and internal control point.

State central administrative body in charge of environmental affairs shall approve the water monitoring program and provide professional

management.

The law also has provision that the state water database shall be composed of information regarding surface and groundwater, prospects of mineral water, space indicators, volume of entire and usable potential water resource, quality, changes and monitoring-research result information, water utilization, waste water removal information, ecology-economic evaluation and information on water user and consumer, report of exploration and survey, location of water facilities and their capacity, technical specifications and etc.

According to the law, State central

administrative body in charge of environmental affairs shall approve the list of hazardous substances of water pollution, however, not materialized yet.

Waste water disposal permit for processes of releasing more than 50m³ per day and or the release is considered to contain hazardous components shall be issued by the Basin administration based on decisions by the State central administrative body in charge of

environmental affairs, and permit for processes that release less than 50m³ per day shall be issued by local governors based on decisions by the Basin administration. There are also compensation and penalty coordination in the law, where the amount shall be calculated per kilograms and grams of pollutants corresponding to the set amount released per day – below or over 50m³ per day.

ARTICLE 10. ENVIRONMENTALLY SOUND INTERIM STORAGE OF MERCURY, OTHER THAN WASTE MERCURY

Each Party shall take measures to ensure that the interim storage of such mercury and mercury compounds intended for a use allowed to a Party under this Convention is undertaken in an environmentally sound manner, taking into account any guidelines, and in accordance with any requirements, adopted pursuant to paragraph 3.

Mercury and mercury compounds are in the list of banned and restricted chemicals and when it comes to temporary storage, Article 10 of the Law on Toxic and Hazardous Chemicals and “Procedure for Storage, Transport, Use and Disposal of Toxic and Hazardous Chemicals”, approved by joint order 54/A/136/A/215 of 2017 by the Vice Prime Minister, Minister of Environment and Minister of Health shall be followed.

The procedure points out the standards for chemicals storage design, as well as requirements for environmental impact assessment for the storage. It's not required to obtain license for storage of toxic and hazardous chemicals and responsibility for storage safety is assigned to the user, importer and exporter of the chemicals.

“Occupational safety and health. General requirements for storage of toxic and hazardous chemicals and products. MNS 6458: 2014” shall be followed when building storage for chemical substances and products. The standard sets out location, design, perimeter, protection, electric and ventilation systems, security requirements,

alarms, response actions, tools and equipment in case of emergency such as spillage and release, markings and labelling etc.

In case of mercury and mercury compounds storage, the Law on Waste and “Procedure for hazardous waste temporary storage, collection, transport, recycling, disposal, registration and reporting” shall be followed.

As defined in the Law on Waste, “disposal of waste” means landfilling, biological, chemical and physical treatment, incineration, disinfection and temporary storage in special containers in order to prevent any adverse effects from waste on human health and environment. Therefore, long term storage of mercury and mercury compounds in special containers shall be deemed as a type of disposal and requirements for disposal shall be followed.

Hazardous waste disposal operation shall be permitted by the Ministry of Environment and the license shall be given to those who meet the requirements set forth in “Requirements for hazardous waste transportation, collection,

storage, recycling, disposal and export operations and permitting procedures”/Annex to Order A/18, 2018 by the Minister of Environment and Tourism/.

“Procedure for hazardous waste temporary storage, collection, transport, recycling, disposal, registration and reporting” shall be followed.



ARTICLE 11. MERCURY WASTES

3. Each Party shall take appropriate measures so that mercury waste is:

- (a) Managed in an environmentally sound manner, taking into account the guidelines developed under the Basel Convention and in accordance with requirements that the Conference of the Parties shall adopt in an additional annex in accordance with Article 27. In developing requirements, the Conference of the Parties shall take into account Parties' waste management regulations and programmes;
- (b) Only recovered, recycled, reclaimed or directly re-used for a use allowed to a Party under this Convention or for environmentally sound disposal pursuant to paragraph 3 (a);
- (c) For Parties to the Basel Convention, not transported across international boundaries except for the purpose of environmentally sound disposal in conformity with this Article and with that Convention. In circumstances where the Basel Convention does not apply to transport across international boundaries, a Party shall allow such transport only after taking into account relevant international rules, standards, and guidelines.

Article 5 of the Law on Waste is dedicated for coordination and regulation related to hazardous waste management.

Licensing requirements for transportation, collection, storage, recycling, disposal and export of hazardous wastes are given in the law.

License for hazardous waste export is issued by the Ministry of environment if it's

impossible to treat or dispose of the waste in Mongolia and the importing country is permitted to accept.

Import and transboundary movement of hazardous waste through Mongolia is prohibited for use, storage, temporary storage and disposal purposes, according to the Law on Waste.

ARTICLE 12. CONTAMINATED SITES

1. Each Party shall endeavour to develop appropriate strategies for identifying and assessing sites contaminated by mercury or mercury compounds.

No regulation except for the licensing for contaminated site clean up operation as stipulated in the "Requirements for hazardous waste transportation, collection, storage, recycling,

disposal and export operations and permitting procedures"/ Annex to Order A/18, 2018 by the Minister of Environment and Tourism/.

2. Any actions to reduce the risks posed by such sites shall be performed in an environmentally sound manner incorporating, where appropriate, an assessment of the risks to human health and the environment from the mercury or mercury compounds they contain.

Individuals, economic entities and organizations engaged in production, storage and use of toxic and hazardous chemicals must have the risk assessment of the chemicals made under the Law on Environmental Impact Assessment, according to the **Law on Toxic and Hazardous Chemicals**.

Regulation for Risk Assessment of Toxic and Hazardous Chemicals /Joint Order A-50/378/565, 2012 by the Minister of Environment, Minister of Health and Chairman of National Emergency Management Agency/ shall be followed in the risk assessment.

5.3 | CURRENT REGULATIONS OF MERCURY AGAINST MINAMATA CONVENTION PROVISIONS AND RECOMMENDED REGULATORY ACTIONS



Table 22. Current Regulations of Mercury Against Minamata Convention Provisions and Required Regulatory Actions

Minamata Convention Provisions	Existing Regulations in Mongolia	Responsible Bodies	Recommended Actions
<p>Article 3. Mercury supply sources and trade.</p> <p>5 (a) Endeavour to identify individual stocks of mercury or mercury compounds exceeding 50 metric tons, as well as sources of mercury supply generating stocks exceeding 10 metric tons per year, that are located within its territory.</p>	<p>1) Law on Minerals states that the Parliament has the power to restrict and prohibit the issuance of exploration and mining licenses.</p> <p>2) The State administrative body in charge of geology and mining issues exploration and mining licenses.</p>	<p>Parliament MMHI</p>	<p>Approve a resolution on prohibiting the licensing for mercury exploration and mining.</p>
<p>6. Each Party shall not allow the export of mercury except:</p> <p>(a) To a Party that has provided the exporting Party with its written consent, and only for the purpose of:</p> <p>(I) A use allowed to the importing Party under this Convention;</p> <p>or</p> <p>(II) Environmentally sound interim storage as set out in Article 10.</p>	<p>1) In accordance with the Law on Toxic and Hazardous Chemicals and Law on Licenses for Economic Activities Permissions for export, import, transboundary movement, production, trade and use of toxic and hazardous chemicals shall be issued by the state central administrative organ in charge of environment.</p> <p>2) Mercury and mercury compounds are chemicals which are listed in the toxic and hazardous chemicals banned and restricted use in Mongolia. Therefore, in case of export permission, a conclusion of experts group under National Toxic and Hazardous Chemicals Management and Policy Coordination Council is required.</p>	<p>MET</p>	<p>No actions recommended.</p>

<p>Article 4. Mercury-added products. Each Party shall not allow, by taking appropriate measures, the manufacture, import or export of mercury-added products listed in Part I of Annex A after the phase out date specified for those products, except where an exclusion is specified in Annex A or the Party has a registered exemption pursuant to Article 6.</p>	<p>1) The list of permitted pesticides, chemical fertilizers, substances for household pest control, disinfection and sterilization and the amount of the chemicals to be used shall be revised and approved on an annual basis, in accordance with the Law on Toxic and Hazardous Chemicals.</p> <p>2) According to the Law on Toxic and Hazardous Chemicals, the Government shall approve a regulation on registration, collection, transportation, storage, disposal, import, export and transboundary movement of chemicals that restricted to use in Mongolia.</p> <p>3) According to the Law on Waste, the Government shall approve the list of hazardous wastes banned or restricted to import into Mongolia.</p> <p>4) List of goods to be prohibited to import or under permits to Mongolia are approved by following lists: "List of a group of goods prohibited from crossing the state border" /Parliament Resolution №5, 1998/, "List of codified goods prohibited from crossing the state border" /Government Resolution №54, 2001/ and "List of codified goods to be transported across the state borders Subject to License" /Government Resolution №219, 2002/</p>	<p>MET MoH MFALI</p> <p>MET MoH</p> <p>Government</p> <p>CGA</p>	<p>No action but refrain adding mercury containing pesticides and disinfection and sterilization substances into the list.</p> <p>Approve specific procedure for regulating activities related to mercury-added products and mercury containing wastes.</p> <p>Add wastes of mercury-added products that listed in Part 1 of Annex A, as well as used products, in the list of goods prohibited to import into Mongolia.</p> <p>1) Develop national harmonized system code for mercury-added products, 2) Add products listed in Part I of Annex A of the convention into the "List of codified goods prohibited from crossing the state border".</p>
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<p>Article 5. Manufacturing processes in which mercury or mercury compounds are used.</p> <p>2. Each Party shall not allow, by taking appropriate measures, the use of mercury or mercury compounds in the manufacturing processes listed in Part I of Annex B after the phase-out date specified in that Annex for the individual processes, except where the Party has a registered exemption pursuant to Article 6.</p>	<p>Law on Toxic and Hazardous Chemicals, Law on Licenses for Economic Activities authorizes state central administrative organ in charge of environment to issue licenses for toxic and hazardous chemicals use.</p>	<p>MET</p>	<p>No manufacturing processes in Mongolia that use mercury. No additional actions recommended since it can be controlled through the licensing system.</p>
<p>Article 7. Artisanal and small-scale gold mining.</p> <p>2. Each Party that has artisanal and small-scale gold mining and processing subject to this Article within its territory shall take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing.</p>	<p>1) According to the Law on Toxic and Hazardous Chemicals, the Government shall decide the sector and volume to be used of chemicals that restricted to use in Mongolia. By the Order 135 of 2008 by the Minister of Environment, mercury is prohibited to be used in minerals mining and processing.</p> <p>2) According to the Law on Minerals, ASGM activity can be carried out without special license but with the ASGM field assessment from the state central administrative organ in charge of geology and mining.</p> <p>3) "Regulation on Exploring Minerals by Small-Scale Mining" /Government Resolution No 151, 2017/</p> <p>The small-scale miners shall exercise the following rights and responsibilities:</p> <ul style="list-style-type: none"> - to classify and concentrate the extracted minerals at the designated area by the license holder and extraction shop; - not to use hazardous and toxic chemicals in mining activities, and not to use explosive substances and blasting equipments/ tools/ unless are performed by licensed body. 	<p>MET MoH</p>	<p>Renew the order 135 or pass new order on the prohibition of mercury to be used not only in mining, but also in dental clinics and manufacturing processes.</p>
		<p>MMHI SSIA</p>	<p>Temporarily regulate to process gold ores from ASGM-ers at plants where cyanide technology is used.</p>

<p>Article 8. Emission.</p> <p>3. A Party with relevant sources shall take measures to control emissions and may prepare a national plan setting out the measures to be taken to control emissions and its expected targets, goals and outcomes.</p>	<p>According to the Law on Air, the Government shall approve national programme on air protection and climate change and manage implementation of the programme.</p>	<p>Government MET</p>	<p>Add objectives and actions towards the reduction of mercury emission in the national programme.</p>
<p>4. For its new sources, each Party shall require the use of best available techniques and best environmental practices to control and, where feasible, reduce emissions, as soon as practicable but no later than five years after the date of entry into force of the Convention for that Party. A Party may use emission limit values that are consistent with the application of best available techniques.</p>	<p>1) According to the Law on Air, the state central administrative organ in charge of environment shall issue permits and licenses to major stationary facilities that produce air pollution; extend, terminate, and invalidate their duration, and establish the maximum limits of air pollutants to be emitted from the facilities, to tariff for service of experts group. This regulation is not so enforced in practice.</p> <p>2) Law on Environmental Impact Assessment provided that recommendations for introducing BAT/BEP for the reduction of pollution in the impact assessment report.</p>	<p>MET MoH MMHI</p>	<p>Revise the Law on Air to regulate the following:</p> <ul style="list-style-type: none"> - Approval of air pollutant sources - Renew the requirements for new stationary air pollutant sources - Add provisions for the introduction of BAT/BEP on pollution control in new pollutant sources.

<p>5. For its existing sources, each Party shall include in any national plan, and shall implement, one or more of the following measures, taking into account its national circumstances, and the economic and technical feasibility and affordability of the measures, as soon as practicable but no more than ten years after the date of entry into force of the Convention for it:</p> <p>(a) A quantified goal for controlling and, where feasible, reducing emissions from relevant sources;</p> <p>(b) Emission limit values for controlling and, where feasible, reducing emissions from relevant sources;</p> <p>(c) The use of best available techniques and best environmental practices to control emissions from relevant sources;</p> <p>(d) A multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions;</p> <p>(e) Alternative measures to reduce emissions from relevant sources.</p>	<p>1) According to the Law on Air, state central administrative body in charge of environment shall have the following rights in respect of air protection:</p> <ul style="list-style-type: none"> - approve list of hazardous pollutants; - establish and run the national monitoring network that is to conduct regular monitoring, measurements, observations, and assessments of air quality, negative physical impacts on the air, acidic precipitation, stratospheric ozone, and green house gas contents. <p>Also the law provides that:</p> <p>2) economic entities, organizations, citizens shall equip with air pollution control system with pollutant neutralization and cleaning system, reduce negative physical impacts and monitor every source in order to run their operations using major stationary source of air pollution.</p> <p>3) According to the Law on Air Pollution Payment, following shall pay air pollution payment, which include raw coal miners, holders of permit for major stationary sources of air pollution; citizen, business entities, or organizations using air polluting sources.</p> <p>Specialized agency shall determine whether the emissions from major sources exceed the standards and in case if the emissions are over the limit, environmental inspectors and local Governors shall enforce corrective actions and impose penalty.</p> <p>State central administrative body in charge of environment shall approve the list of air pollutants emitted from major stationary sources to air.</p>	<p>1) Revise the Law on Air to regulate the following:</p> <ul style="list-style-type: none"> - Renew the requirements for existing stationary air pollutant sources, - Add provisions for the introduction of BAT/BEP on pollution control in pollutant sources. <p>2) Make standards of permissible level of pollutants emitted to air by each source types</p> <p>3) Renew the tariff for penalty for air polluters based on scientific calculations.</p>	<p>1) Add provisions for registration and monitoring of soil and water polluting point sources in the Law on Soil Protection and Prevention from Desertification and the Law on Water</p>
	<p>MET MFE MMHI</p>		<p>MET</p>
<p>Article 9. Releases.</p> <p>3. Each Party shall, no later than three years after the date of entry into force of the Convention for it and on a regular basis thereafter, identify the relevant point source categories and keep record constantly.</p>	<p>No regulations on registration and monitoring of soil and water polluting point sources.</p>		

<p>5. each Party shall implement, one or more of the following measures:</p> <p>(a) A quantified goal and emission limit values for controlling and, where feasible, reducing emissions from relevant sources; and, where feasible, reducing emissions from relevant sources;</p> <p>(b) The use of best available techniques and best environmental practices to control emissions from relevant sources;</p> <p>(c) A multi-pollutant control strategy that would deliver co-benefits for control of mercury emissions;</p> <p>(d) Alternative measures to reduce emissions from relevant sources</p>	<p>1) According to the Law on Soil Protection and Prevention from Desertification, state central administrative body in charge of environment shall approve the list of chemicals that pollute soil, types and permissible limit.</p> <p>2) Law on Water authorizes the state central administrative organ in charge of environment to approve the water monitoring program and provide professional management and monitoring program, as well as administering a database. In addition, it shall approve the list of hazardous water polluting substances.</p> <p>Depending on the volume and pollutant types of waste water from water polluting sources, waste water discharge permit shall be issued either by the Basin Administration or by local Governor.</p> <p>In case of pollution that exceeds the standards, and if the releases are over the limit, environmental inspectors and local Governors shall enforce corrective actions and impose penalty.</p> <p>3) According to the Law on Water Pollution Fee, polluters, even if their discharge is within the limit, shall pay fee for discharges to the natural environment or sewage treatment facility.</p> <p>4) Level of pollutant in waste water from processes with less than 50m³ discharge a day shall be determined by the state central administrative organ in charge of environment together with relevant authorities.</p>	<p>1) Make standards of permissible level of pollutants released to soil and water by each source types</p> <p>2) Determine requirements for water and soil polluting point sources and introduce BAT/BEP in monitoring releases from the sources and reducing the releases through the Law on Soil Protection and Law on Water.</p> <p>3) Change the water pollution fee payment system where discharge is less than the set limit and encourage processes to invest in their own waste water treatment facility.</p> <p>4) Revise the payment calculation indicators and amount of penalty.</p>
<p>Article 10. Environmentally sound interim storage of mercury, other than waste mercury</p> <p>2. Each Party shall take measures to ensure that the interim storage of such mercury and mercury compounds intended for a use allowed to a Party under this Convention is undertaken in an environmentally sound manner, taking into account any guidelines, and in accordance with any requirements, adopted pursuant to paragraph 3.</p>	<p>Law on Toxic and Hazardous Chemicals requires specially designed storage for toxic and hazardous chemicals and the "Occupational safety and health. General requirements for storage of toxic and hazardous chemicals and products. MNS 6458:2014" standard set the requirements for the storage.</p> <p>According to the Law on Waste, state central organ in charge of environment shall issue permit for collection, transportation, storage, recycling, disposal and export activities.</p>	<p>MET NEMA SSIA Governors</p> <p>No additional actions recommended.</p>

<p>Article 11. Mercury wastes</p> <p>3. Each Party shall take appropriate measures so that mercury waste is: (a) Managed in an environmentally sound manner, taking into account the guidelines developed under the Basel Convention and in accordance with requirements that the Conference of the Parties shall adopt in an additional annex in accordance with Article 27. In developing requirements, the Conference of the Parties shall take into account Parties' waste management regulations and programmes;</p> <p>(b) Only recovered, recycled, reclaimed or directly re-used for a use allowed to a Party under this Convention or for environmentally sound disposal pursuant to paragraph 3 (a);</p> <p>(c) For Parties to the Basel Convention, not transported across international boundaries except for the purpose of environmentally sound disposal in conformity with this Article and with that Convention. In circumstances where the Basel Convention does not apply to transport across international boundaries, a Party shall allow such transport only after taking into account relevant international rules, standards, and guidelines.</p>	<p>1) According to the Law on Waste, state central organ in charge of environment shall issue permit for collection, transportation, storage, recycling, disposal and export operation. Article 5 of the law regulates hazardous waste packaging, temporary storage, collection, transportation, recycling and disposal operators.</p> <p>2) Law on Waste set out requirements for location, operation and licensing requirements for hazardous waste storage, recycling and disposal facilities.</p> <p>3) Requirements for hazardous waste export is also provided by the Law on Waste, which is in compliance with the Basel Convention requirements.</p> <p>4) Export hazardous wastes shall be packed and labelled in compliance with international standards and requirements and shall have accompanying documents.</p> <p>5) The Law on Waste prohibits import and transboundary movement of hazardous wastes.</p>	<p>MET Governors</p> <p>Regulation is in place, but enforcement measures shall be taken.</p>
<p>Article 12. Contaminated sites</p> <p>1. Each Party shall endeavour to develop appropriate strategies for identifying and assessing sites contaminated by mercury or mercury compounds.</p>	<p>No law regulations on contaminated sites.</p> <p>Requirements for issuing permit of hazardous waste collection, transportation, storage, recycling, disposal and export operation and is and its Procedure provides requirements for operation to clean contaminated sites.</p>	<p>MET SSIA</p> <p>Add provisions on contaminated sites in the Law on Soil Protection.</p>
<p>2. Any actions to reduce the risks posed by such sites shall be performed in an environmentally sound manner incorporating, where appropriate, an assessment of the risks to human health and the environment from the mercury or mercury compounds they contain.</p>	<p>1) Law on Toxic and Hazardous Chemicals provides that environmental impact assessment is mandatory for production, storage, and usage of toxic and hazardous chemicals, as specified in the Law on Environmental Impact Assessment.</p> <p>2) Law on Environmental Impact Assessment requires the detailed environmental impact assessment on project activities.</p> <p>3) Risk assessment is on toxic and hazardous chemicals shall be done.</p>	<p>MET</p> <p>No additional actions recommended.</p>

5.4 ENVIRONMENTAL POLICY AND INSTITUTIONAL FRAMEWORK

5.4.1. LEAD AUTHORITY IN MONGOLIA RESPONSIBLE FOR THE IMPLEMENTATION OF MINAMATA CONVENTION

Ministry of Environment and Tourism (MET) is the state central administrative organ in charge of environment and is responsible for the development of legislation, ecological policy and programmes for nature and green development and coordination of the policies and programmes implementation.

The Law on Toxic and Hazardous Chemicals (2006) regulates activities related to collection, transportation, storage, disposal, import, export, transboundary movement, use, production, trade and control of toxic and hazardous chemicals and the coordination and compliance responsibility is on the state central organ in charge of environment.

Cross-sectoral coordination is managed by the National Chemicals Management and Policy Coordination Council, which is chaired by the Minister of Environment and with the Ministry's officer in charge of chemicals is responsible for secretarial tasks. Experts group consisting of officers and workers from related stakeholders, including ministries, research institutions, universities, works under the Council. It has affiliates in aimag provinces and the Capital city.

Roles and responsibility of the Ministry of Environment and Tourism/ National Chemicals Management and Policy Coordination Council for the implementation of the Minamata Convention on Mercury are as following:

- Develop and implement national policies and programmes and coordinate activities by stakeholders;
- Prepare report on the measures it has taken to implement the provisions of this Convention

and on the effectiveness of such measures and submit to the Convention Secretariat;

- Develop and submit for approval additions and amendments to corresponding legislation with intention to reduce emissions and releases from mercury-added products and wastes and effectively regulate import, export, disposal and use of mercury and mercury compounds;
- Make additions to the list of toxic and hazardous chemicals that restricted and banned to use in Mongolia ;
- Make procedures for the coordination of activities related to mercury, mercury-added products and and mercury containing wastes and for the reduction and monitoring of emissions and releases;
- Encourage Best Available Techniques and Best Environmental Practices (BAT/BEP) in sources of mercury emissions and releases;
- Establish sound hazardous waste management system;
- Conduct inventory of mercury emissions and sources and maintain a database;
- Organize mercury monitoring and research;
- Implement international and regional projects;
- Provide information to public, businesses and agencies;
- Exchange information with counterparts and international organization; and
- Organize trainings and awareness raising activities.

5.4.2. MAJOR GOVERNMENT STAKEHOLDERS IN MERCURY COORDINATION

1. MINISTRY OF HEALTH

- Develop and implement national policy on the protection of human health from the risks of mercury and mercury compounds;
- Research and assess effects of mercury and mercury compounds on human health, especially, on women, children and reproduction, as well as of cancer cases;
- Study occupational diseases and take measures for the prevention;
- List classifications and amount of disinfection hygienic substances to be used in Mongolia and coordinate use and import, and
- Organize trainings and awareness raising activities.

2. MINISTRY OF ENERGY

- Develop and implement national policies and programmes of energy sector;
- Encourage BAT/BEP in coal-fired power plants.

3. MINISTRY OF FOOD, AGRICULTURE AND LIGHT INDUSTRY

- Develop and implement a national policy on the coordination of import, trade, use and production of pesticides used in agricultural sector and on the monitoring of pesticide residues in foodstuffs;
- Test and register pesticides and set the amount of pesticides to be used in Mongolia;
- Provide food security;
- Take measures for the disposal of obsolete pesticides and determination of contaminated sites and decontamination.

4. MINISTRY OF MINING AND HEAVY INDUSTRY

- Develop and implement a national policy on mining and heavy industry;
- Issue exploration and mining licenses;
- Encourage BAT/BEP in processes that are considered mercury sources;
- Coordinate, control and assess artisanal and small-scale gold mining activities.

5. MINISTRY OF FINANCE

- Support allocating fundings and budgets required for the successful implementation of the Minamata Convention;
- Include projects and programmes for implementing the Minamata Convention in the policy on economic cooperation, loan and grant and monitor the implementation process;
- Support investment and funding for environmentally harmless hazardous waste facility;
- Draft a proposal for adding mercury-added products in the list of goods banned and limited through Mongolian border; and
- Propose tax exemption and facilitation on equipment and goods purchased through projects funding.

6. MINISTRY OF FOREIGN AFFAIRS

- Coordinate the cooperation and relationships between international and national organizations in relation to the implementation of Minamata Convention, and
- Cooperate with international organizations and countries for experience and information

exchange.

7. STATE SPECIALIZED INSPECTION AGENCY

- Ensure the realization of international and national legislation and acts on mercury;
- Implement the border control over mercury and mercury compounds and products containing them;
- Inspect and monitor security and quality of the environment, food and work places, and
- Inspect and monitor the releases and wastes from sources.

8. NATIONAL EMERGENCY MANAGEMENT AUTHORITY

- Maintain a database of all types of fire cases;
- Execute decontamination and cleaning actions in acse of mercury spill and pollution; and
- Manage the temporary storage of mercury and mercury compounds.

9. CUSTOMS GENERAL AUTHORITY

- Customs inspection and control on mercury and mercury-added products;
- Report on the import information of mercury-added products to related stakeholders;
- Border control over illegal import and export of mercury;
- Improve knowledge and qualification of customs officers on mercury and mercury compounds, and
- Experience sharing with counterparts in other countries on border monitoring of mercury.

10. MONGOLIAN AGENCY FOR STANDARDIZATION AND METROLOGY

- Develop and implement national policies and programmes on standardization and conformity;
- Add mercury into national standards on environment, labor security and waste; and
- Accept and approve international analytical standards on mercury testing and aalysis.

5.4.3 INSTITUTIONAL FRAMEWORK, RESPONSIBILITIES AND CAPACITY FOR MERCURY REGULATION

Minamata Convention Provisions Relevant to Mongolian Context	Agency	Actions	Feasibility
PARTIES TO THE CONVENTION ARE OBLIGED TO THE FOLLOWING RESPONSIBILITIES:			
Article 3. Mercury Supply Source and Trade			
– Shall not allow primary mercury mining that was not being conducted within its territory at the date of entry into force of the Convention for it.	MMHI	Prohibit licensing for mercury exploration and mining	Feasible
– Prohibit mercury export and import with exclusion of Provision 6, Article 3 of the convention.	MET	Prohibit export or import permit for mercury in cases other than Provision 6, Article 3 of the convention	Feasible

Article 4. Mercury-added products			
– Phase out production, import and export of products listed in Part I, Annex A of the convention after 2020.	MET MoH	– Approve specific procedure for regulating activities related to mercury-added products and mercury containing wastes	Feasible
	MET MoH MFALI	– Not to add mercury containing pesticides and disinfection and sterilization substances into the annual list of permitted pesticides, chemical fertilizers and substances for household pest control, disinfection and sterilization.	Feasible
	MET	– Add wastes of mercury-added products, as well as used products that listed in Part 1 of Annex A of the convention in the list of some wastes prohibited to import into Mongolia.	Feasible
	CGA	– Develop national harmonized system code for mercury-added products	Feasible
	MET CGA	– Add products listed in Part I of Annex A of the convention into the “List of codified goods prohibited from crossing the state border”.	Feasible
Article 7. Artisanal and small-scale gold mining			
– Shall take steps to reduce, and where feasible eliminate, the use of mercury and mercury compounds in, and the emissions and releases to the environment of mercury from, such mining and processing.	MET MMHI SSIA	– Implement and improve compliance of the “Procedure for Artisanal and Small-Scale Minerals Mining”.	– Legislations are in place, however, control over implementation and compliance is weak, and awareness raising activities are not sufficient. – Number of staff is not sufficient.
	MET MMHI	– Establish a shop or plant that process the ore brought from hard-rock mines by ASGMers using mercury free methods, or regulate to process the gold ores at plants where cyanide technology is used.	– Efficient technologies are not readily available for ores from hard-rock mines to be processed.
– Develop and implement a national action plan in accordance with Annex C of the convention no later than three years after entry into force of the Convention for it or three years after the notification to the Secretariat, whichever is later.	SSIA NPA CGA	– Strengthen illegal import and use of mercury.	– Border control is weak and lack of devices and equipment for detection – Knowledge and awareness is insufficient
	MET MMHI	– Develop the national action plan and implement and report	

Article 8. Emissions			
<p>– Control and, where feasible, reduce emissions of mercury and mercury compounds to the atmosphere through measures to control emissions from the point sources falling within the source categories listed in Annex D and may prepare a national plan setting out the measures to be taken to control emissions and its expected targets, goals and outcomes within four years of the date of entry into force of the Convention for that Party.</p>	<p>MET MMHI SSIA MASM</p>	<p>– Prepare and implement the national plan</p>	
	<p>MET SSIA MASM</p>	<p>– Develop standards for permissible limit of air polluting substances from the sources listed in Annex D of the convention.</p>	
	<p>MET</p>	<p>– Add mercury parameters in the air quality monitoring.</p>	<p>– Technical and experts capacity is not sufficient in determining mercury in air quality monitoring</p>
	<p>MET MMHI</p>	<p>– Build capacity to make internal monitoring on sources listed in Annex D.</p>	<p>– No capacity for internal monitoring</p>
<p>– For its new sources, each Party shall require the use of best available techniques and best environmental practices to control and, where feasible, reduce emissions, as soon as practicable but no later than five years after the date of entry into force of the Convention for that Party.</p>	<p>MET MMHI</p>	<p>– Organize trainings on BAT/BEP</p> <p>– Control through the detailed environmental impact assessment</p>	<p>– Awareness and knowledge of BAT/BEP is insufficient among public servants at all level</p> <p>– Awareness and knowledge of BAT/BEP is insufficient among economic entities</p>
<p>– For its existing sources, each Party shall include in any national plan, and shall implement, one or more of the following measures, taking into account its national circumstances, and the economic and technical feasibility and affordability of the measures, as soon as practicable but no more than ten years after the date of entry into force of the Convention for it.</p>	<p>MET MMHI</p>	<p>– Conduct inventory of emissions from the sources</p>	<p>– Awareness and knowledge of BAT/BEP is insufficient among environmental assessment companies</p>

Article 9. Releases			
– Shall, no later than three years after the date of entry into force of the Convention for it and on a regular basis thereafter, identify the relevant point source categories and keep record constantly.	MET	Determine the classification of point sources	– Technical and experts capacity is not sufficient in determining mercury in soil and water quality monitoring
– A Party with relevant sources shall take measures to control releases and may prepare a national plan setting out the measures to be taken to control releases and its expected targets, goals and outcomes within four years of the date of entry into force of the Convention for that Party.	MET	Prepare and implement the national plan	
– Each Party shall establish, as soon as practicable and no later than five years after the date of entry into force of the Convention for it, and maintain thereafter, an inventory of releases from relevant sources.	MET	Conduct the inventory of releases from relevant point sources	Feasible
Article 10. Environmentally sound interim storage of mercury, other than waste mercury			
– Each Party shall take measures to ensure that the interim storage of such mercury and mercury compounds intended for a use allowed to a Party under this Convention is undertaken.	MET Capital city Provinces	Build temporary storage of hazardous wastes in every provinces	– Awareness and knowledge about hazardous wastes among officials who are in charge of budget and funding is insufficient – insufficient financial resources
Article 11. Mercury wastes			
– Manage mercury containing waste in environmentally sound manner. – Mercury waste is recovered, recycled, reclaimed or directly re-used for a use allowed to a Party under this Convention or for environmentally sound disposal.	MET Capital city Provinces	– Build hazardous waste facility – Establish hazardous waste collection system	– Awareness and knowledge about hazardous wastes among officials who are in charge of budget and funding is insufficient – insufficient financial resources – Lack of experience

<p>– Mercury wastes shall not be transported across international boundaries except for the purpose of environmentally sound disposal in conformity with this Article and with Basel Convention.</p> <p>– In circumstances where the Basel Convention does not apply to transport across international boundaries, a Party shall allow such transport only after taking into account relevant international rules, standards, and guidelines.</p>	MET	Implement and control through the permitting and licensing procedures for hazardous waste export	– Knowledge and experience of public servants is low
Article 12. Contaminated sites			
<p>– Develop appropriate strategies for identifying and assessing sites contaminated by mercury or mercury compounds.</p> <p>– . Any actions to reduce the risks posed by such sites shall be performed in an environmentally sound manner.</p>	MET MECS	– Identify contaminated sites	<p>Feasible to identify contaminated sites</p> <p>Lack of technical and human resource capacity to decontaminate and clean contaminated sites</p>
Article 13. Financial resources and mechanism			
<p>– Undertakes to provide, within its capabilities, resources in respect of those national activities that are intended to implement this Convention.</p>	MoF	– Allocate funding in state budget for financing related actions	<p>– Funding is insufficient</p> <p>– Lack of support and commitment from decision-makers</p>
Article 16. Health Aspects			
<p>– Promote the development and implementation of strategies and programmes to identify and protect populations at risk, particularly vulnerable populations, and which may include adopting science-based health guidelines relating to the exposure to mercury and mercury compounds, setting targets for mercury exposure reduction, where appropriate, and public education, with the participation of public health and other involved sectors.</p>	MoH	<p>– Build capacity for mercury bio-monitoring</p> <p>– Conduct mercury exposure research among vulnerable populations</p>	<p>– Analytical capacity is lacking for determining mercury in human, fauna and flora</p> <p>– Funding is insufficient</p>
<p>– Establish and strengthen, as appropriate, the institutional and health professional capacities for the prevention, diagnosis, treatment and monitoring of health risks related to the exposure to mercury and mercury compounds</p>	MoH	– Capacity building for treatment and providing health-care to those who exposed to mercury	– Lack of knowledge and experience among health-care providers

Article 17. Information Exchange			
<p>– Each Party shall facilitate the exchange of:</p> <p>(a) Scientific, technical, economic and legal information concerning mercury and mercury compounds, including toxicological, ecotoxicological and safety information;</p> <p>(b) Information on the reduction or elimination of the production, use, trade, emissions and releases of mercury and mercury compounds;</p> <p>(c) Information on technically and economically viable alternatives to:</p> <p>(i) Mercury-added products;</p> <p>(ii) Manufacturing processes in which mercury or mercury compounds are used; and</p> <p>(iii) Activities and processes that emit or release mercury or mercury compounds; including information on the health and environmental risks and economic and social costs and benefits of such alternatives; and</p> <p>(d) Epidemiological information concerning health impacts associated with exposure to mercury and mercury compounds, in close cooperation with the World Health Organization and other relevant organizations, as appropriate.</p>	MET	Coordinate and facilitate obtaining information, as specified in Article 17 of the convention, from the Secretariat and disseminate the information and knowledge	Feasible
Article 18. Public information, awareness and education			
<p>Each Party shall, within its capabilities, promote and facilitate:</p> <p>(a) Provision to the public of available information on:</p> <p>(I) The health and environmental effects of mercury and mercury compounds;</p> <p>(II) Alternatives to mercury and mercury compounds;</p> <p>(III) The topics identified in paragraph 1 of Article 17;</p> <p>(IV) The results of its research, development and monitoring activities under Article 19; and</p> <p>(V) Activities to meet its obligations under this Convention;</p> <p>(b) Education, training and public awareness related to the effects of exposure to mercury and mercury compounds on human health 41 and the environment in collaboration with relevant intergovernmental and non-governmental organizations and vulnerable populations, as appropriate.</p>	MET MoH MMHI MECS	<p>– Organize awareness raising activities and trainings for vulnerable groups and public on health and environmental impacts of mercury and its compounds</p> <p>– Provide information on alternatives to mercury-added products to public and importers</p> <p>– Organize awareness raising activities and trainings on hazardous wastes and provide guidance on how to handle hazardous wastes</p>	Feasible



IMPLEMENTATION PLAN AND PRIORITIES FOR ACTION

6.1 PRIORITIES FOR ACTION

Results of mercury emissions and sources show that a total of 93,468.0 kg of mercury is emitted and released per year in Mongolia and 76% of this emissions released to soil, 16% to air, 2% to water, whereas 4% to by-products and impurities, 1% to general waste and 1% to sector-specific treatment/disposal.

The inventory also identified 3 largest sources mercury emissions and releases in Mongolia, which are as below:

- Primary (virgin) metal production (96.31%)
- Extraction and use of fuels/energy sources (1.47%)
- Mercury-added products (0.67%).

The other sources of mercury are: waste deposition/landfilling and waste water treatment releases 0.58%, cement and lime production emits 0.40%, waste burning emits 0.29%, manometers and gauges with mercury, laboratory chemicals and equipment with mercury 0.19%, production of recycled ferrous metal 0.05%, and crematoria and cemeteries 0.05%.

Emissions and releases from the primary metal production is 90 tonnes per year and 88% of which come from gold extraction and initial processing and 12% from copper extraction and initial processing with releases to land account for 79.2%, emissions to air account for 14.4%, releases to water account for 1.8%, with by-products 3.5%, and releases from sector-specific treatment/disposal 1.2%.

Emissions and releases from extraction and use of fuels/energy is 1.4 t/y and 78.3% of which comes from coal combustion in large power plants, 18.1% from other coal combustion category, which is mainly heating boilers and household stoves, and 2.5% from small-scale thermal power plants. Major output pathway from this source category is air, which account

for 95.9% of the emissions and 4.1% is released with ash and waste.

Next significant source of mercury is mercury-added products with output of 622.9 kg and 75.8% of which is released with waste.

Taking into consideration the source categories and emissions stated above, as well as bearing in mind the objective on reducing risks from primary anthropogenic sources of mercury on human health and the environment, we set the priorities for action as following:

Priority 1: Improving the management of wastes from ore processing in mining industry and reduce impacts on the environmental media;

Priority 2: Reducing emissions from coal-fired power plants, thermal plants and boilers through the application of Best Available Techniques and Best Environmental Practices;

Priority 3: Building capacity for phasing-down the use of mercury-added products to minimum possible level and for collecting, storing and disposing of wastes from these products in environmentally sound manner.

Within the framework of the strategy to reduce mercury emissions and releases from the sources, the following measures shall be taken to achieve the goals and objectives.

6.2 GOALS AND OBJECTIVES OF THE IMPLEMENTATION PLAN ON THE MINAMATA CONVENTION ON MERCURY



Goal: Implementation Plan for the successful fulfillment of obligations and responsibilities of the Minamata Convention on Mercury aims at reducing potential risks on human health and the environment down to the minimum possible level through phasing down the emissions and releases from anthropogenic sources of mercury.

In a bid to achieve the goal, we set the following objectives:

1. Improve the environmental quality through reducing mercury emissions and

releases from primary anthropogenic sources;

2. Phase down the use of mercury-added products and build capacity for the collection, storage and disposal of wastes from these products in environmentally sound manner;

3. Create mercury monitoring and information exchange system; and

4. Raise public awareness through trainings and information dissemination on harmful impacts and management of mercury.

6.3 IMPLEMENTATION PLAN

6.3.1. IMPROVE THE ENVIRONMENTAL QUALITY THROUGH REDUCING MERCURY EMISSIONS AND RELEASES FROM PRIMARY ANTHROPOGENIC SOURCES:

Following actions shall be taken:

Action 1. Improve legislations for better regulating the monitoring of mercury emissions and releases from primary anthropogenic sources.

Action 2. Build capacity for internal monitoring of point sources listed in Annex D of the convention.

Action 3. Reduce mercury emissions through introducing BAT/BEP in the point sources listed in Annex D of the convention t.

Action 4. Eliminate the illegal use of mercury in ASGM and propose mercury-free alternatives and coordination.

Expected outcomes:

1. Procedures and standards to monitor phasing down of mercury emissions and releases.
2. Monitoring of mercury emissions from point sources.
3. Mercury emissions and releases are reduced.
4. Illegal use of mercury is eliminated.

6.2.2. PHASE DOWN THE USE OF MERCURY-ADDED PRODUCTS AND BUILD CAPACITY FOR THE COLLECTION, STORAGE AND DISPOSAL OF WASTES FROM THESE PRODUCTS IN ENVIRONMENTALLY SOUND MANNER:

Following actions shall be taken:

Action 1. Improve legislations for better regulating the import and use of mercury-added products.

Action 2. Improve capacity of customs and border control agencies.

Action 3. Establish management system for the collection, storage and disposal of wastes from these products in environmentally sound manner.

Expected outcomes:

1. Border control over mercury-added products is improved.
2. Import of mercury-added products is reduced.
3. Collection system for wastes of mercury-added products is established.
4. Capacity for environmentally sound storage and disposal system for wastes of mercury-added products is built.

6.2.3. CREATE MERCURY MONITORING AND INFORMATION EXCHANGE SYSTEM:

Following actions shall be taken:

Action 1. Add mercury parameters into the monitoring indicators of air, soil and water.

Action 2. Establish information exchange platform for mercury emissions and releases.

Action 3. Build capacity for mercury bio-monitoring.

Action 4. Research sites contaminated with mercury and clean environmentally sound manner.

Expected outcomes:

1. Environmental mercury monitoring system is created.
2. Database of mercury sources and emissions is created and preferably pollutant release and transfer register is established.
3. Capacity for human and wildlife bio-monitoring is built.
4. Capacity for cleaning mercury contaminated sites with environmentally sound manner.

6.2.4. RAISE PUBLIC AWARENESS THROUGH TRAININGS AND INFORMATION DISSEMINATION ON HARMFUL IMPACTS AND MANAGEMENT OF MERCURY:

Following actions shall be taken:

Action 1. Organize trainings and awareness raising activities on impacts and management of mercury and mercury compounds.

Action 2. Disseminate information on mercury-free alternatives.

Action 3. Organize trainings and awareness raising activities on hazardous waste management.

Expected outcomes:

1. Public and vulnerable groups' knowledge and awareness on mercury is improved.
2. Knowledge and awareness of public, importers and government on mercury-free alternatives improved and use of mercury-added products reduced.
3. Awareness on hazardous waste is raised and more importantly safe handling practices improved.

ACRONYMS

IQ	Intelligence Quotient
UNEP	United Nations Environment Programme
INC	Intergovernmental Negotiating Committee
BAT/BEP	Best Available Techniques and Best Environmental Practices
UNO	United Nations Organization
MAS	Mongolian Academy of Science
JICA	Japanese International Cooperation Agency
MET	Ministry of Environment and Tourism
MMHI	Ministry of Mining and Heavy Industry
MoH	Ministry of Health
MFALI	Ministry of Food, Agriculture and Light Industry
CGA	Customs General Authority
SSIA	State Specialized Inspection Agency
NPA	National Police Agency
MASM	Mongolian Agency for Standardization and Metrology
MoF	Ministry of Finance
MECS	Ministry of Education, Culture and Science
FAO	Food and Agricultural Organization

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