

Multi-media Mercury Monitoring and Effectiveness Evaluation of the Minamata Convention

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Office of Mercury Management,
Ministry of the Environment

Historical Background of Minamata Convention

- **1956: Official acknowledgement of Minamata disease**



Mercury level in drinking water, tolerable intake established (1972)
AMAP established (1991), undertakes regional mercury monitoring

- **1998: Heavy metal protocol adopted at CLRTAP*1**

- **2001: UNEP launched mercury program**



UNEP Global Mercury Assessment (2002) alerting global mercury pollution

- **2009: Agreed on legally-binding instrument on mercury**



Intergovernmental Negotiation Committee (7 times, In 2011 in Japan)
Decided the name 'Minamata Convention on Mercury' (Japan's proposal)

- **2013: Adopted 'Minamata Convention on Mercury'**



Japan's legal framework furnished (2015) *2, Accepted convention (2016)

- **2017: Entry into force on 16 August**

1st meeting of the Conference of Parties (COP) (2017)
Intersessional technical works towards COP2 (Nov. 2018)

*1: 51 Parties from Europe and north America under UNECE

*2: Established Mercury Pollution Control Act, Amended Air Pollution Control Act and Order for Enforcement of Waste Management and Cleansing Act

Needs for Mercury Management

- Released from various sources and present throughout the environment
- Persistent and cycles globally
- Serious effects to humans, especially for children's development as a neurotoxicant, as well as to wildlife through food chain
- Less used in developed countries, but still used in developing countries and may be more problematic to them
- Released from natural sources as well, but anthropogenic release increases the atmospheric concentration
- Reduction of anthropogenic release is necessary to reduce risks by global action

Source: UNEP Global Mercury Assessment (2002)

Outlines of Minamata Convention

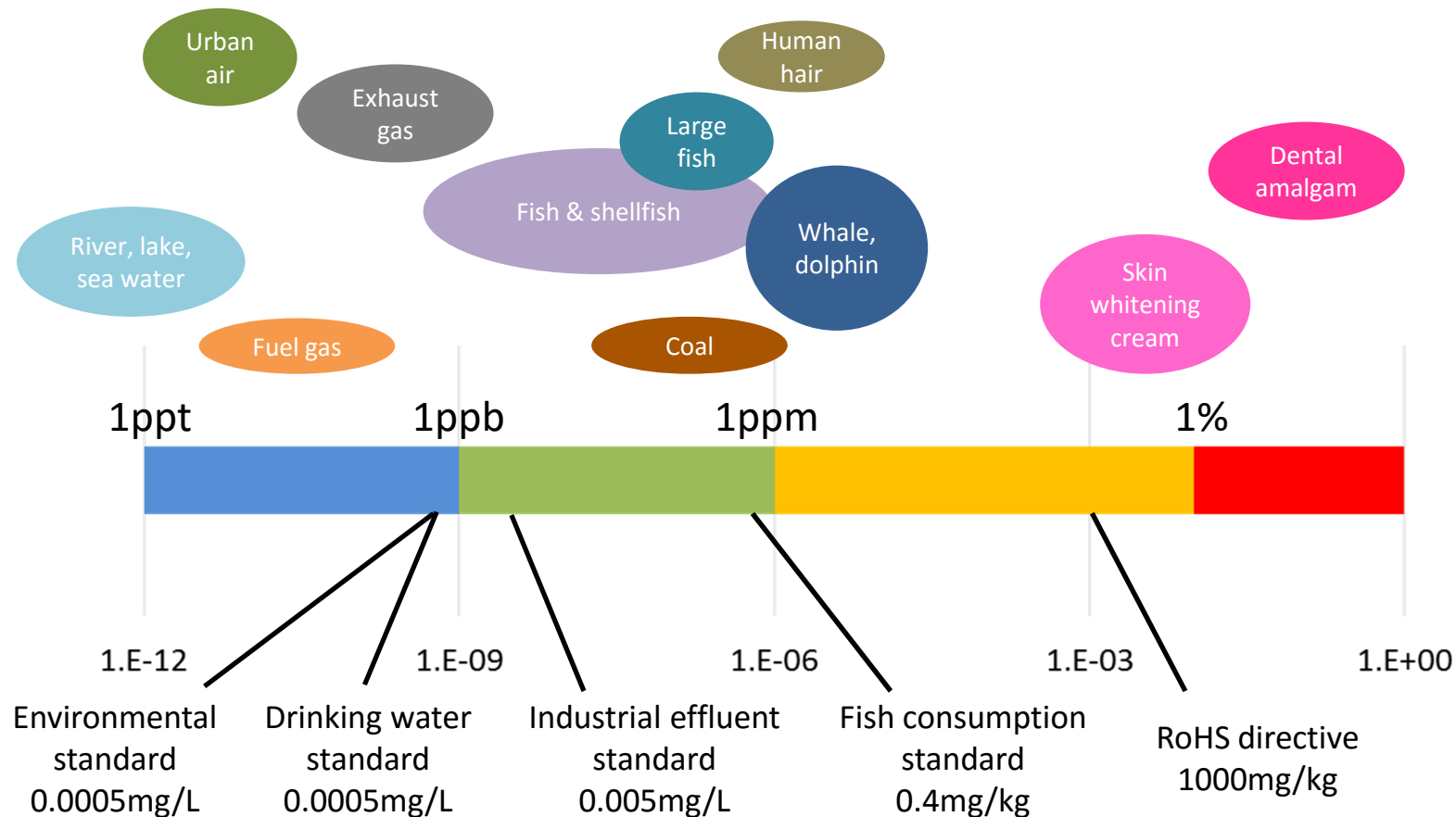
Article	Description
Preamble	Recall risk of mercury, recognize substantial lessons of Minamata disease
Objective (Article 1)	Protect human health and environment from anthropogenic emission and releases of mercury and mercury compounds
Supply and trade (Article 3)	Regulate mercury mining and international trade
Mercury-added products (Article 4)	Regulate manufacturing, import, export of mercury-added products (batteries, switches, lamps, thermometers, sphygmomanometers, etc.)
Manufacturing process (Article 5)	Regulate mercury use in specific manufacturing processes
ASGM (Article 7)	Mercury use reduction in artisanal and small-scale gold mining
Emissions, releases (Article 8, 9)	Regulate atmospheric emissions, releases to water and soil
Interim storage (Article 10)	Environmentally sound interim storage of mercury and mercury compounds
Mercury waste (Article 11)	Environmentally sound management of mercury waste
Contaminated sites (Article 12)	Identify and assess sites contaminated by mercury and mercury compounds
Finance, technical assistance (Article 13, 14)	Financial sources and mechanism, technical assistance and capacity building
Research, development, monitoring (Article 19)	Cooperation for developing and improving inventories, monitoring, modelling, impact assessment
Reporting (Article 21)	Report on measures taken to implement the provisions of the Convention
Effectiveness evaluation (Article 22)	Evaluate the effectiveness of the Convention

Significance of Minamata Convention

- Developed and developing countries cooperatively undertake comprehensive efforts for mercury supply, use, emission, waste, etc., which will result in the emission reduction and prevent global level pollution such as transboundary mercury pollution.
- China, world largest mercury user and emitter, and USA, never ratified chemicals and waste conventions, joined the Convention. Maximizing the participation and achieving consensus to minimize the mercury risks.
- “Minamata Convention” reminds the international commitment not to repeat such health damages and environmental pollutions as Minamata disease. Lessons and experiences of Minamata disease and Minamata in present day will be disseminated globally.

Mercury Levels in Various Media

- Emissions standards: 5 emission categories (Annex D)
- Mercury waste thresholds: under discussions in COP (Article 11)
- Mercury-added products: mercury levels for products (Annex A)

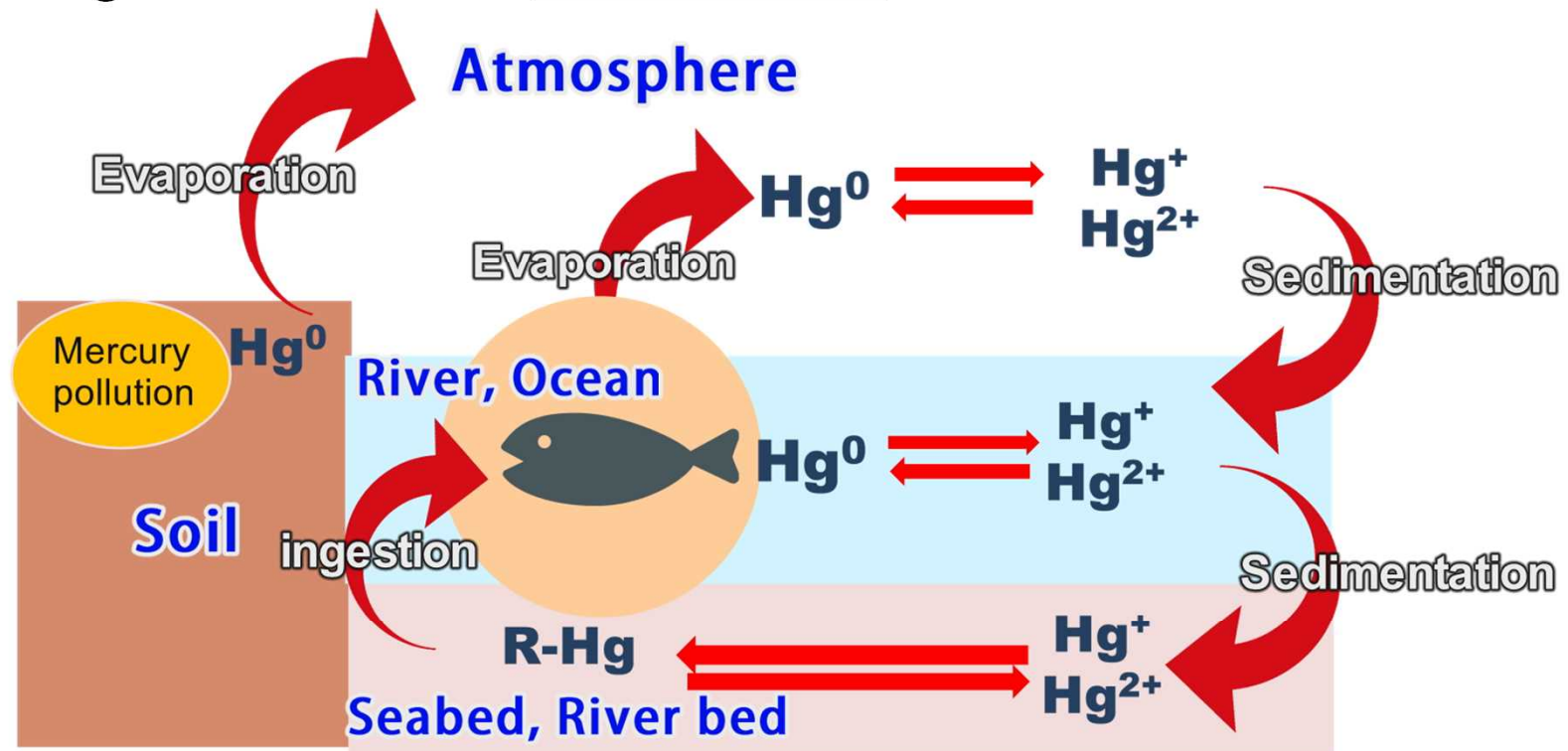


Annex A Part I: Mercury-added Products

Types of products	Description
Batteries	Zinc silver oxide: >=2% , zinc air: >=2%
Switches and relays	Very high accuracy: >20mg
Compact fluorescent lamps for general lighting	<= 30watts: >5mg
Linear fluorescent lamps for general lighting	Triband phosphor < 60watts: >5mg , Halophosphate phosphor <= 40watts: >10mg
High pressure mercury vapour lamps for general lighting	All
Cold cathode fluorescent lamps, external electrode fluorescent lamps for electronic display	<= 500mm: >3.5mg , >500mm and <=1500mm: 5mg , >1500mm: >13mg
Cosmetics	>1ppm
Pesticides, biocides, topical antiseptics	All
Non-electronic measuring devices	Barometers, hygrometers, manometers, thermometers, sphygmomanometers

Fate of Mercury in the Environment

- Mercury is released to the environment from various sources including natural ones in various forms.



- As it does not decompose but circulates globally and may impact wild biota and human by accumulating via food web, global actions to reduce anthropogenic emissions are necessary.

Effectiveness Evaluation Framework

- Framework of periodic evaluation based on the effectiveness indicators conducted by the COP
 - Key question: to what extent the Convention in functioning toward its overall objectives
 - Frequency: no later than 6 years after the entry into force and periodically thereafter
- Establishment of the arrangement of providing itself with comparable monitoring data
 - Presence and movement in the environment
 - Trends in levels in biotic media and vulnerable population
- Evaluation on the basis of available scientific, environmental, technical, financial and economic information

Intersessional Work by ad hoc Group of Experts

Monitoring Experts	Evaluation Experts
<ul style="list-style-type: none">(i) An outline of the types of data that could be <u>comparable on a global basis</u>, as well as their availability;(ii) A draft plan that integrates comparable results for future monitoring that <u>countries and stakeholders may choose to undertake</u>; and as part of this work:<ul style="list-style-type: none">a. Review information on <u>existing monitoring programmes</u>, including from the information that has been reported to the secretariat by Governments and intergovernmental and non-governmental organizations, and others that are available;b. Assess to what extent the information reviewed under paragraph (ii) a. meets the needs for monitoring set out in the Convention, and on that basis outline options to enhance <u>comparability and completeness</u> of the information reviewed;c. Take into consideration cost-effectiveness, practicality, feasibility and sustainability, global coverage, and regional capabilities in identifying opportunities for <u>future enhancements</u> to monitoring;d. Identify <u>available modelling</u> capabilities to assess changes in global mercury levels within and across different media;e. Identify sources of data that can be used for establishing a <u>baseline</u>;f. Identify how monitoring activities may contribute to the development of the effectiveness evaluation framework;	<ul style="list-style-type: none">(i) Identifying the steps required to undertake an effectiveness evaluation;(ii) Suggesting a process flow (schedule) for the effectiveness evaluation planning;(iii) Identifying arrangements for conducting the effectiveness evaluation;(iv) Drafting terms of reference for the committee developing the first effectiveness evaluation;(v) Assessing potential approaches to the development of <u>performance indicators</u>;

Comparison Article 19 vs Article 22

Article 19: Research Development and Monitoring	Article 22: Effectiveness Evaluation
Responsible subject: <u>Parties</u>	Responsible subject: <u>Conference of Parties</u>
<p>○ <u>Shall endeavour to cooperate</u> to develop and improve:</p> <ul style="list-style-type: none"> - Inventories - Modelling and geographically representative monitoring - Assessment of impact on human health and environment - Harmonized methodologies for activities - Information <p>○ <u>Should build</u> on existing monitoring networks and research programmes.</p>	<p>○ <u>Shall evaluate</u> the effectiveness of this convention.</p> <p>○ <u>Shall initiate</u> the establishment of arrangements for providing itself with comparable monitoring data</p> <p>○ The evaluation <u>shall be conducted</u> on the basis of available scientific, environmental, technical, financial and economic information</p>
<p>“...modelling and geographically representative monitoring of levels of mercury and mercury compounds in <u>vulnerable populations</u> and in <u>environmental media</u>, including <u>biotic media</u> such as fish, marine mammals, sea turtles and birds, as well as collaboration in the collection and exchange of relevant and appropriate samples...”</p>	<p>“...arrangements for providing itself with comparable monitoring data on the presence and movement of mercury and mercury compounds in the <u>environment</u> as well as trends in levels of mercury and mercury compounds observed in <u>biotic media</u> and <u>vulnerable populations</u>...”</p>
Eligible to GEF	Not eligible to GEF

Conclusions

- Significant achievement of global society to determine controlling a chemical element in its entire lifecycle
- Peculiar properties of Mercury that cycles globally via atmosphere and ocean against other heavy metals that demonstrate 'traditional*' pollution
- Addressing 'global' environmental issue by science-based investigation of its mechanism and comprehensive planning
- Research and development of multi-media mercury monitoring and mathematical modeling combined for fitting the effectiveness evaluation to actual situation

*Typical pattern: chemical use – discharge – exposure – health damage