



MEC 15 JAKARTA, INDONESIA
STRATEGIES FOR TARGETED EMISSION REDUCTIONS
WORKSHOP 11-12 JULY 2023

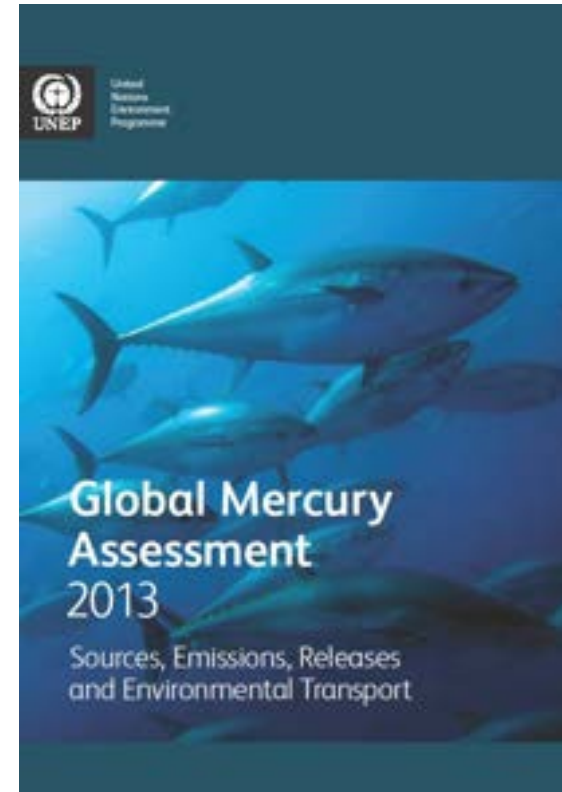
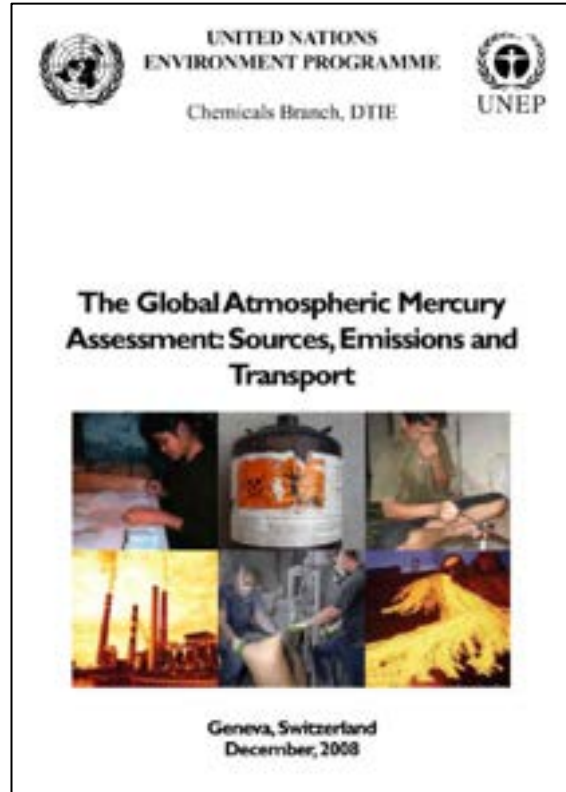
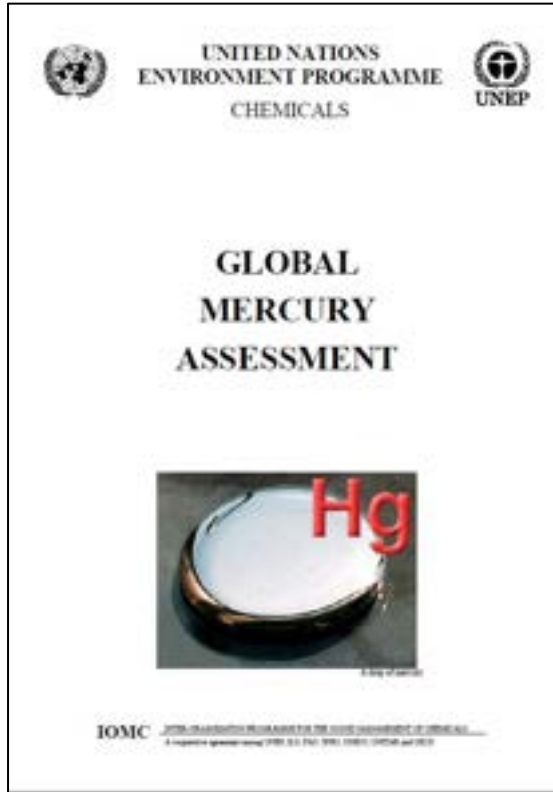
Coal and the Minamata Convention on mercury

Alexander Romanov

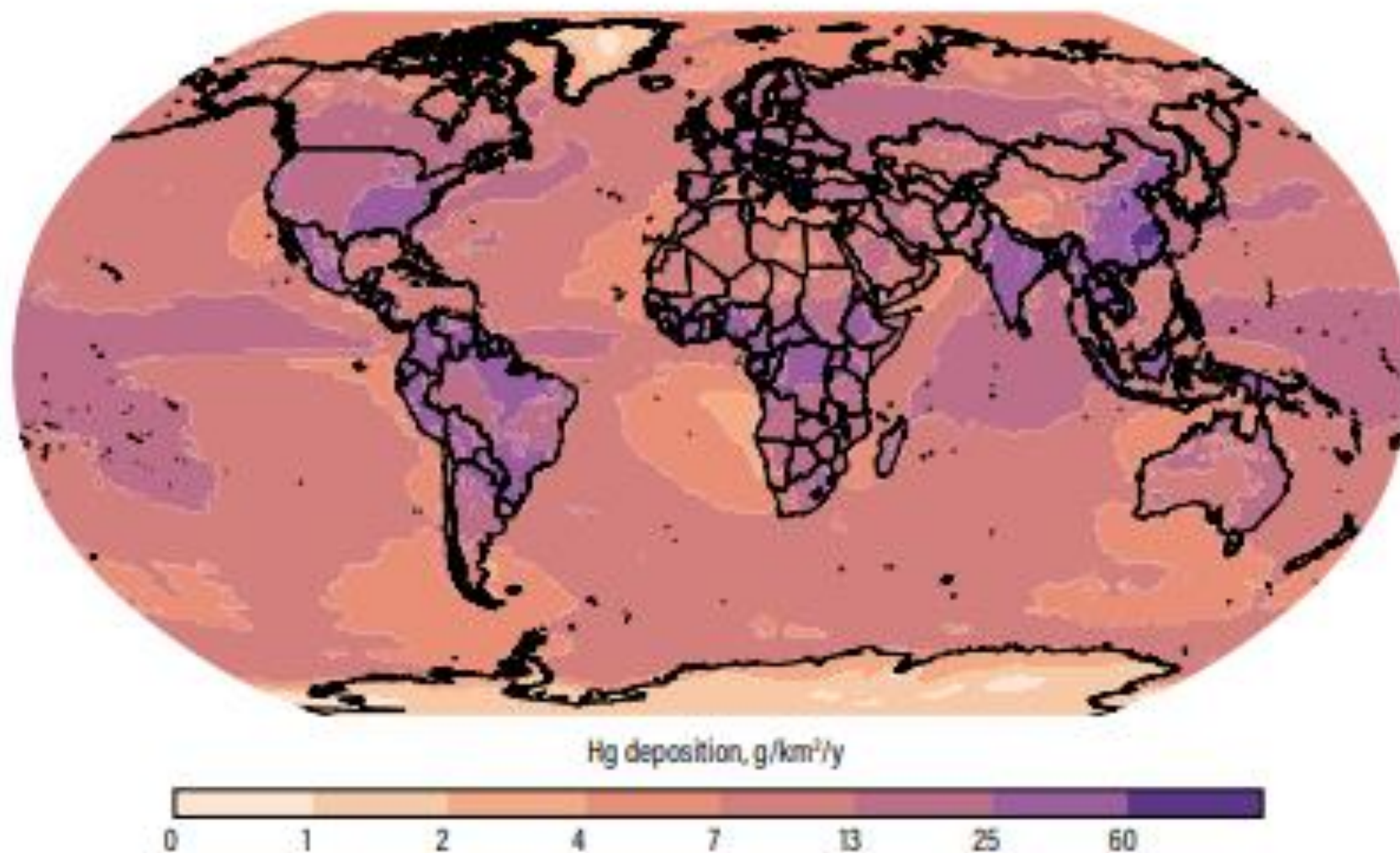
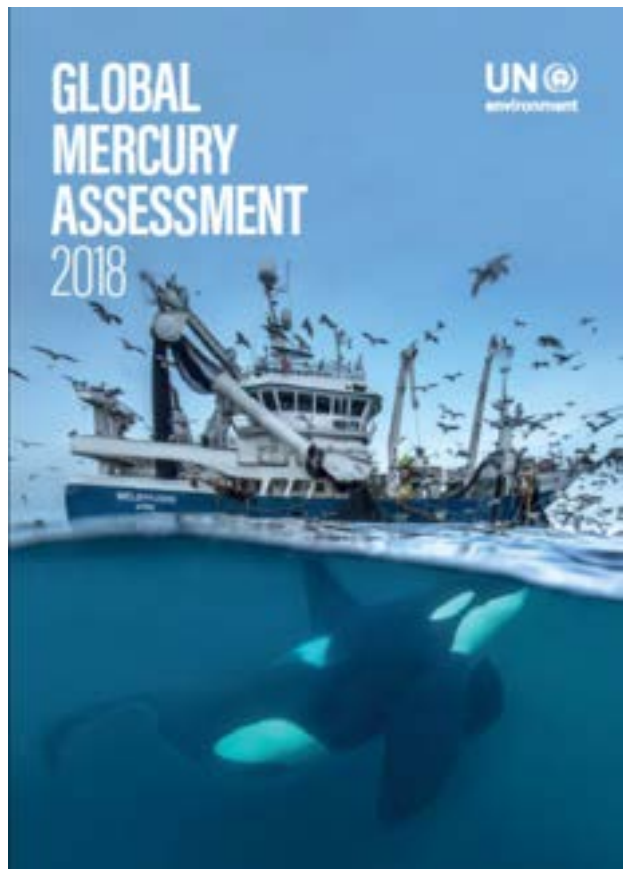
UNEP Sub-regional Office for Central Asia
& Industry and Economy Division/GEF Unit

**Slides below are provided by the Minamata Convention Secretariat*

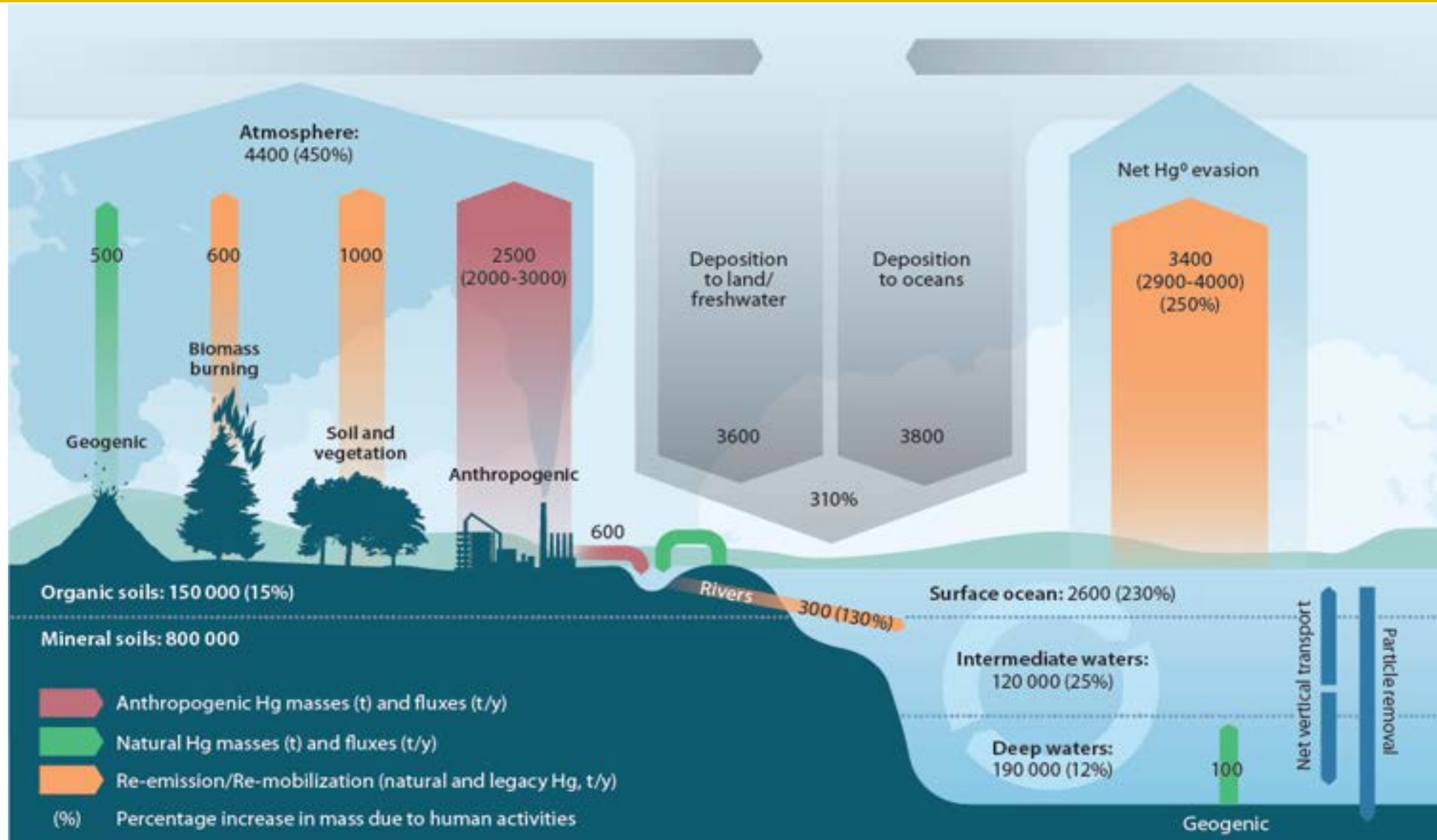
Global Mercury Assessments



Global mercury deposition (2015)



GMA 2018 - Update on global Hg pools and cycles



Global Mercury Assessment 2018 (2015 estimate, tonnes)



Total mercury emission 2,224

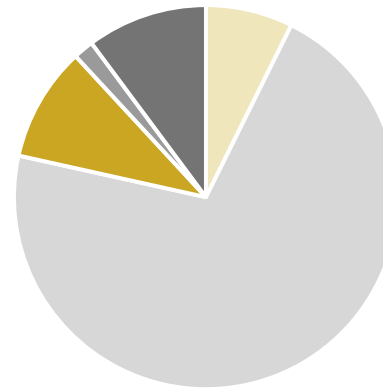
Coal combustion 474

Non-ferrous metals 327

Cement production 233

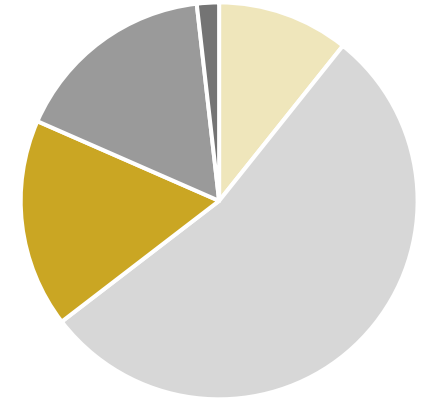
Waste incineration 15

Coal Combustion



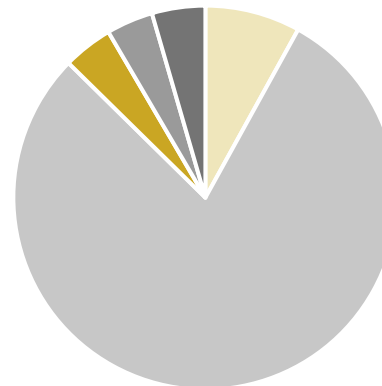
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Non ferrous metals



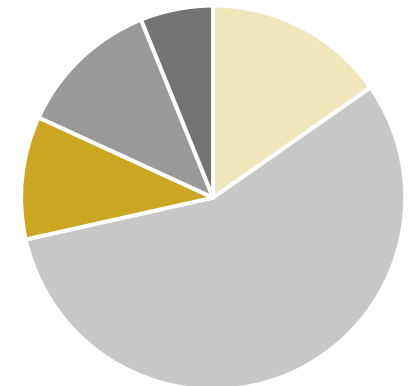
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Cement production



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Waste incineration

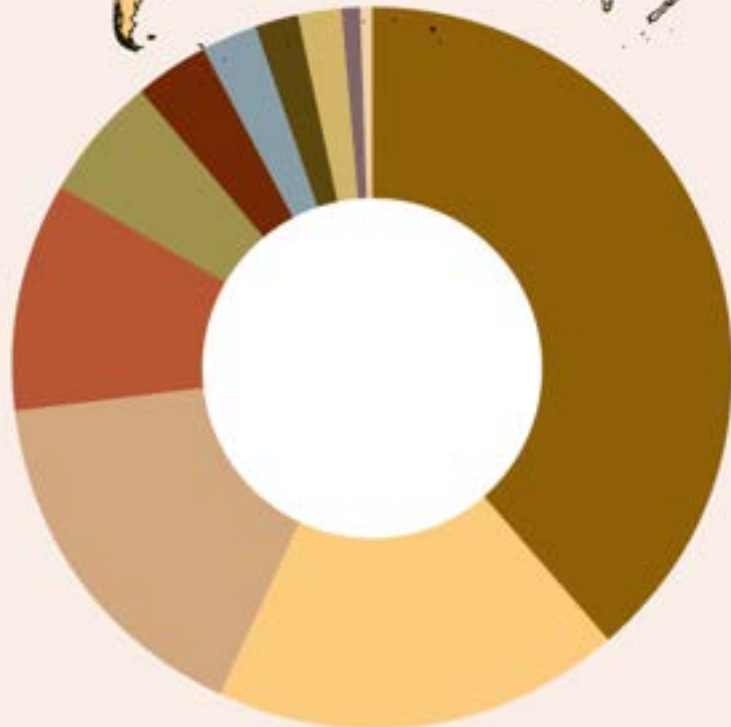
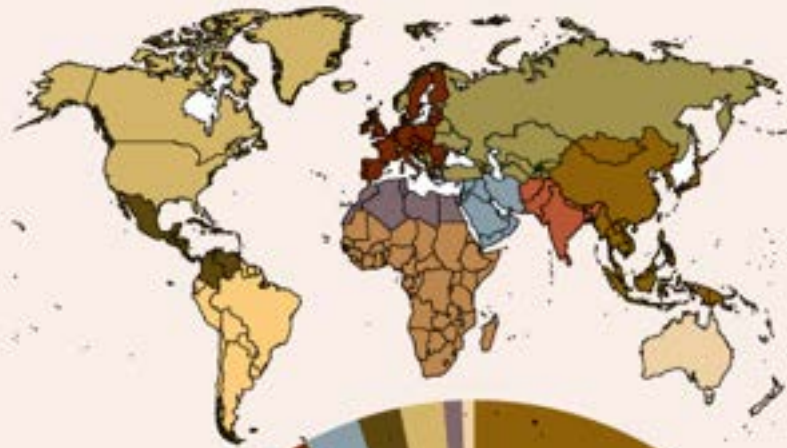


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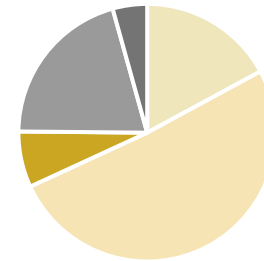
Global Mercury Assessment 2018 – Regional breakdown



Breakdown into UN five regions



- East and Southeast Asia
- South America
- Sub-Saharan Africa
- South Asia
- CIS & other European countries
- EU28
- Middle Eastern States
- Central America and the Caribbean
- North America
- North Africa
- Australia, New Zealand & Oceania



- AF
- AP
- CEE+CA
- LAC
- WEOG

Article 8 of the Minamata Convention



- ▶ Controls the emissions of total mercury to air from
 - Coal-fired power plants
 - Coal-fired industrial boilers
 - Smelting and roasting processes used in the production of non-ferrous metals (lead, zinc, copper and industrial gold)
 - Waste incineration facilities
 - Cement clinker production facilities.
- ▶ Parties with relevant sources shall take measures to control emissions and may prepare a national plan, which is to be submitted **within 4 years after the entry into force** if prepared.
- ▶ For **new sources**, each Party shall require the use of BAT/BEP to control and reduce emissions, as soon as practicable but **no later than 5 years after the date of entry into force**.
- ▶ For **existing sources**, each Party shall include in any national plan, and shall implement, one or more of the following measures, as soon as practicable but **no more than 10 years after the date of entry into force**:
 - A quantified goal
 - Emission limit values
 - The use of BAT/BEP
 - A multi-pollutant control strategy that would deliver co-benefits
 - Alternative measures to reduce emissions from relevant sources
- ▶ Each Party shall establish, as soon as practicable and no later than **5 years after the date of entry into force** of the Convention for it, and maintain thereafter, an **inventory of emissions from relevant sources**.

Guidance under article 8 – COP-1 decisions in 2017



▶ Decision MC-1/4

- Adopted the [guidance](#) on BAT/BEP and on support for parties in implementing the measures
- Recognized that some of the measures described in the guidance may not be available to all parties for technical or economic reasons,
- Requested parties with experience in using such guidance to provide the secretariat with information on that experience, and the secretariat to compile such information and to update the guidance as necessary.

▶ Decision MC-1/16

- Adopted the guidance on criteria that parties may develop to identify emission sources, and on the [methodology for emission inventories](#).



Guidance under article 8 – COP-1 decisions in 2017



- ▶ Chapter I: Introduction
- ▶ Chapter II: Common Techniques
- ▶ Chapter III: Monitoring
- ▶ Chapter IV: Coal-fired power plants and coal-fired industrial boilers
- ▶ Chapter V: Smelting and roasting processes used in the production of non-ferrous metals (lead, zinc, copper and industrial gold)
- ▶ Chapter VI: Waste incineration facilities
- ▶ Chapter VII: Cement clinker production facilities
- ▶ Appendix: New and emerging techniques



BAT/BEP Guidance – Introduction



The process for selecting and implementing BAT could be expected to include the following general steps.

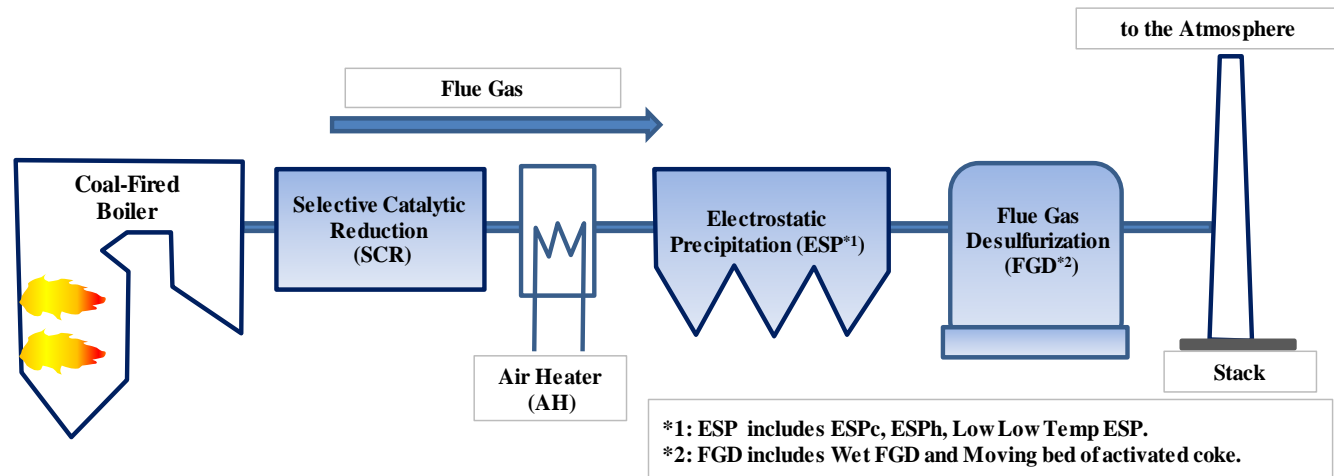
- Step 1: establish information about the source, or source category.
- Step 2: identify the full range of options of emission control techniques.
- Step 3: identify technically viable control options.
- Step 4: select the control technique options which are the most effective for the control and reduction of emissions.
- Step 5: determine which of these options can be implemented under economically and technically viable conditions.

BAT and BEP for coal combustion



Best available techniques

1. Primary measures to reduce the mercury content of coal - **Coal washing, selection or blending**
2. Measures to reduce mercury emissions during combustion - **Fluidized bed boiler**, resulting in much higher percentages of particulate mercury in flue gas, which leads to high mercury removal efficiency of downstream fabric filters (FF) or electrostatic precipitators (ESP)
3. Mercury removal by **co-benefit of conventional air pollution control system** - mainly used for the removal of PM (**ESP, FF** or a combination of both), SO₂ (dry or wet flue gas desulfurization, **FGD**), and NO_x (Selective catalytic reduction, **SCR**), but can result in substantial reductions in mercury emissions as a co-benefit.
4. Dedicated mercury control technologies - including **activated carbon injection** technology or the use of additives.





Best environmental practices

1. Identifying key process parameters - including mercury input control in coal and related monitoring
2. Consideration of energy efficiency for whole plant
3. Maintenance of air pollution control system and removal efficiency
4. Environmentally sound management of the plant
5. Environmentally sound management of coal combustion residues

Guidance under article 9 – Decision MC-4/5

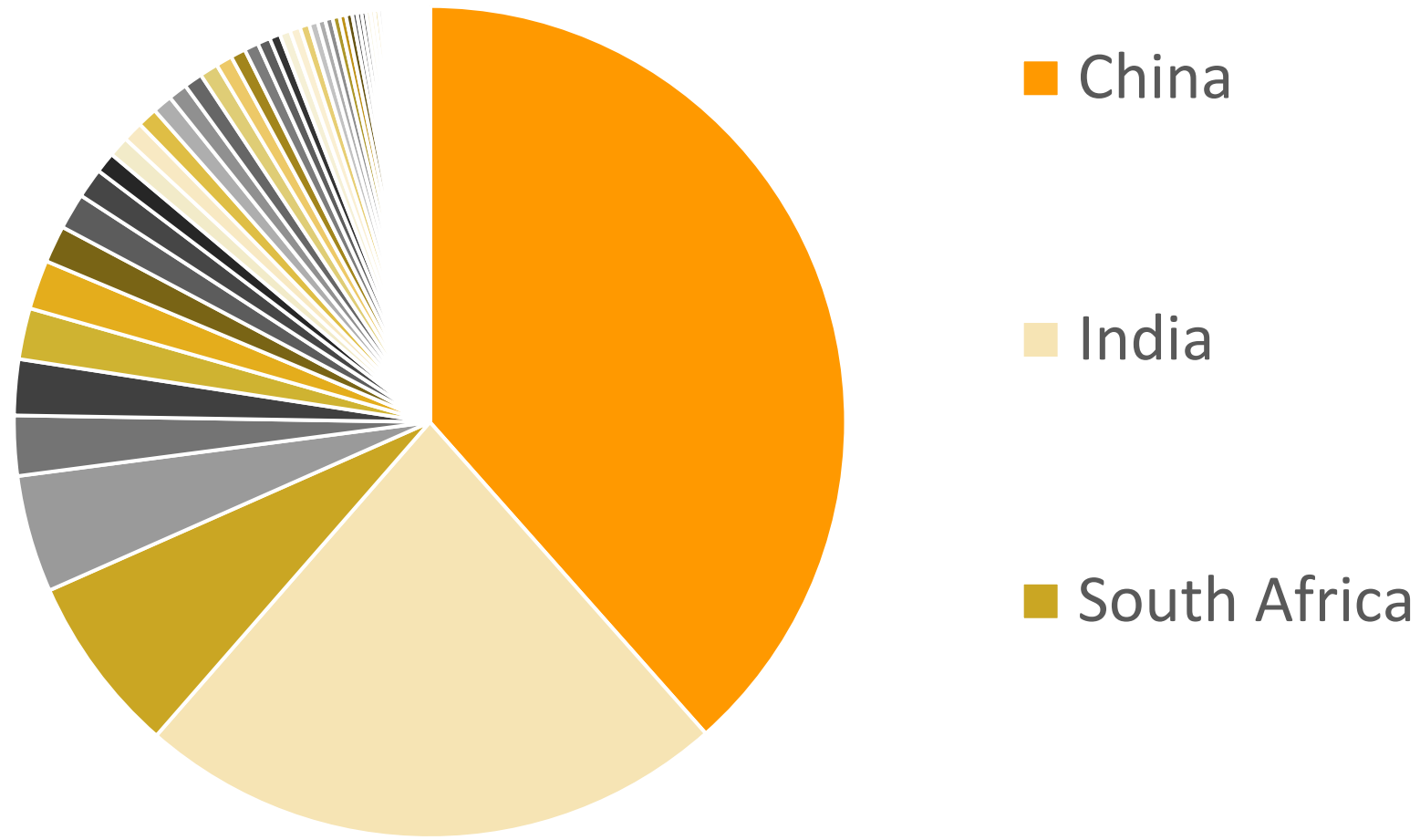


- ▶ COP-4 Decision [MC-4/5](#)
 - Adopted the [guidance](#) on methodologies for release inventories, including a list of potentially relevant point source categories.
 - Requested the group of technical experts (established by COP-2) to develop guidance on BAT/BEP in line with a [road map](#).
- ▶ Group of technical experts on mercury releases
 - Reviewed the information on national regulations or industry practices relating to the control of mercury releases from relevant sources.
 - Aims to post the first draft of the guidance on the website in December 2022 with a commenting period until February 2023, and finalize the draft as COP-5 document based on the comments and input.

List of potentially relevant point source categories

Source category in the UNEP mercury inventory toolkit		Release sources (not addressed in other provisions of the Minamata Convention) ¹	Documentation of the releases
Source category: Extraction and use of fuels/energy sources			
5.1.1	Coal combustion in power plants	Releases to land and water from coal storage, coal washing and air-pollution-control systems.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit.
5.1.2.1	Coal combustion in coal-fired industrial boilers	Releases to land and water from coal storage, coal washing and air-pollution-control systems.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit.
5.1.2.2	Other coal use	Releases to land and water from coal storage, coal washing and air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit.
	Coal mining	Releases to land and water from wet processing methods, such as coal flotation and coal washing.	Pollutant release and transfer registers of the European Union and the United States.
5.1.3	Extraction, refining and use of petroleum	Releases to land and water from oil extraction, oil refining and air-pollution-control systems.	Global Mercury Assessment 2018. Reference report of the mercury inventory toolkit. Gollop, Darrell L. (Thermachem). Removal of mercury from water in the petroleum industry. Twenty-first International Petroleum Environmental Conference. Pollutant release and transfer registers of the European Union and the United States.
5.1.4	Extraction, refining and use of natural gas	Releases to land and water from natural-gas extraction and refining.	Reference report of the UNEP mercury inventory toolkit. Pollutant release and transfer registers of the European Union and the United States.
5.1.6	Biomass-fired power and heat production	Releases to land and water from air-pollution-control systems.	Reference report of the UNEP mercury inventory toolkit.
Source category: Primary (virgin) metal production			
5.2.1	Mercury (primary) mining and mineral processing	Releases to land and water from mining and mineral processing.	Global Mercury Assessment 2018. Reference report of the UNEP mercury inventory toolkit.
	Mining, mineral processing, smelting and roasting of non-ferrous metals other than mercury	Releases to land and water from collected mine drainage, mineral processing, air-pollution-control systems, associated smelting and roasting and process residues.	Global Mercury Assessment 2018 (aluminium, copper, gold, lead, zinc). Reference report of the UNEP mercury inventory toolkit. Pollutant release and transfer registers of Australia, Canada, the European Union, Norway and the United States.

Mercury Emission from coal combustion (estimated)



Total: 474t

Existing regulations on mercury emission from coal combustion

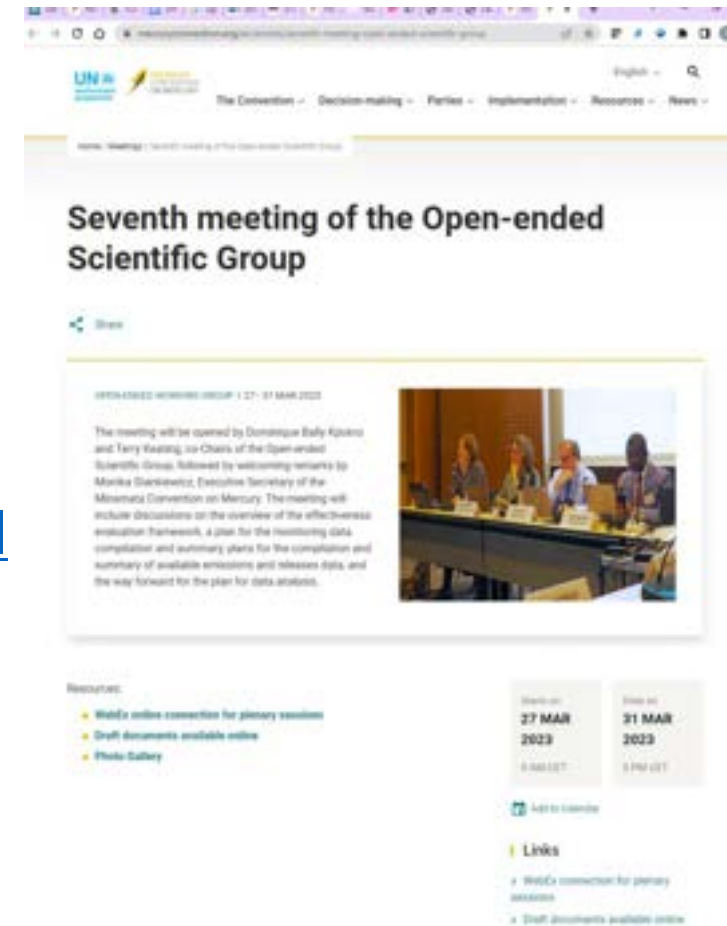


- China – 0.03mg/m³ (coal PP). Pollution permits. Technical specifications.
- India – 0.03mg/m³ (coal PP)
- Indonesia – 0.03mg/m³. Action plan developed.
- Mongolia – no limit
- Sri Lanka – 0.01mg/m³ (any process), 0.001-0.01mg/m³ for incinerators
- Thailand – no limit for coal. General limit 3mg/m³
- Viet Nam – No limit for coal. 0.5/0.2 mg/m³ for waste incineration.

Plan for emission and release data summary – data sources



- ▶ Inventories under Articles 8 and 9 – reported as part of national [reporting under Article 21](#)
 - Dedicated inventories for the Convention or mass-balance studies
 - Emission inventory under the UNECE Air Convention and other regional initiatives
 - National or regional pollutant releases and transfer registers (PRTR)
 - National inventories developed also as part of [Minamata Initial Assessments \(MIA\)](#).
- ▶ Inventories from scientific initiatives
 - Global Mercury Assessment
 - Arctic Monitoring and Assessment Programme (AMAP)
 - Emission Database for Global Atmospheric Research (EDGAR)
 - Streets et.al. (2017, 2019)
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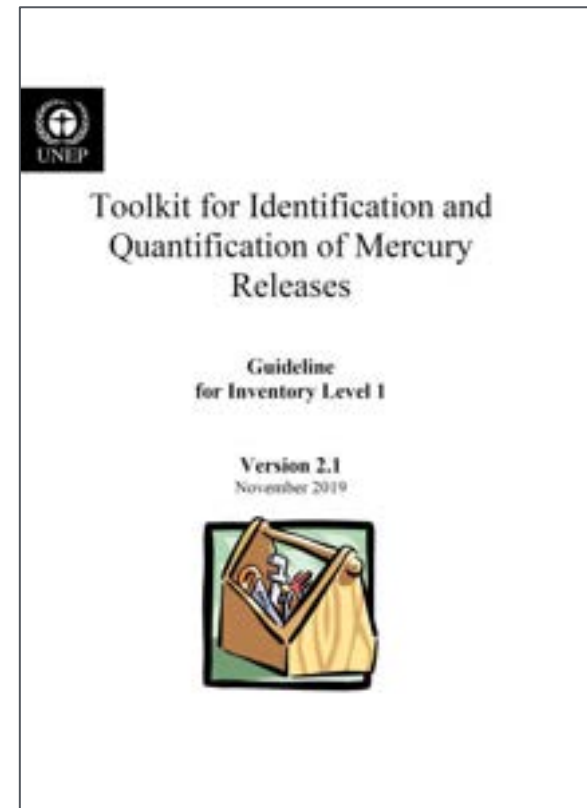
Guidance on the methodology for preparing inventories of emissions pursuant to Article 8



Methodology to establish an emissions inventory typically involves many or all of the following steps:

- Plan the approach for development of inventory, within available resources, and consider how to collect, handle and review data, including any quality control and quality assurance processes
- Collect existing emissions data as a useful starting point
- Identify relevant sources within each source category
- Establish facility-based emissions reporting requirements
- Collect the emissions reports from facilities on a periodic basis (e.g. annually)
- Develop a database to store the reported emissions data
- Facilitate analysis of the results
- Make the data publicly accessible and searchable.

UNEP inventory toolkit could be a good starting point for parties developing their own emissions inventories.





MINAMATA
CONVENTION
ON MERCURY

Thank you for your attention

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