

# How the implementation of the Minamata Convention requires valuable inputs from the scientific community

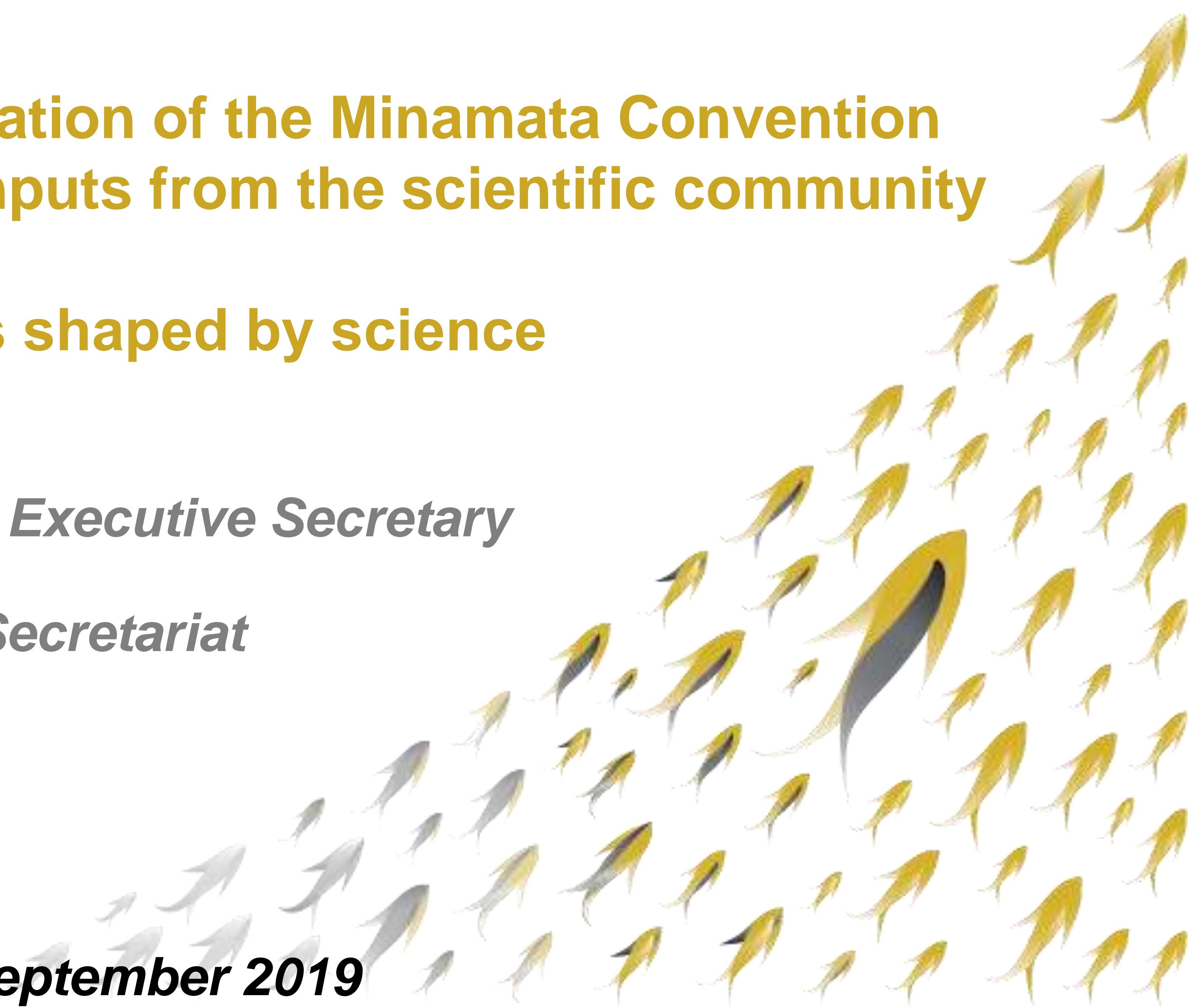
...And how it was shaped by science

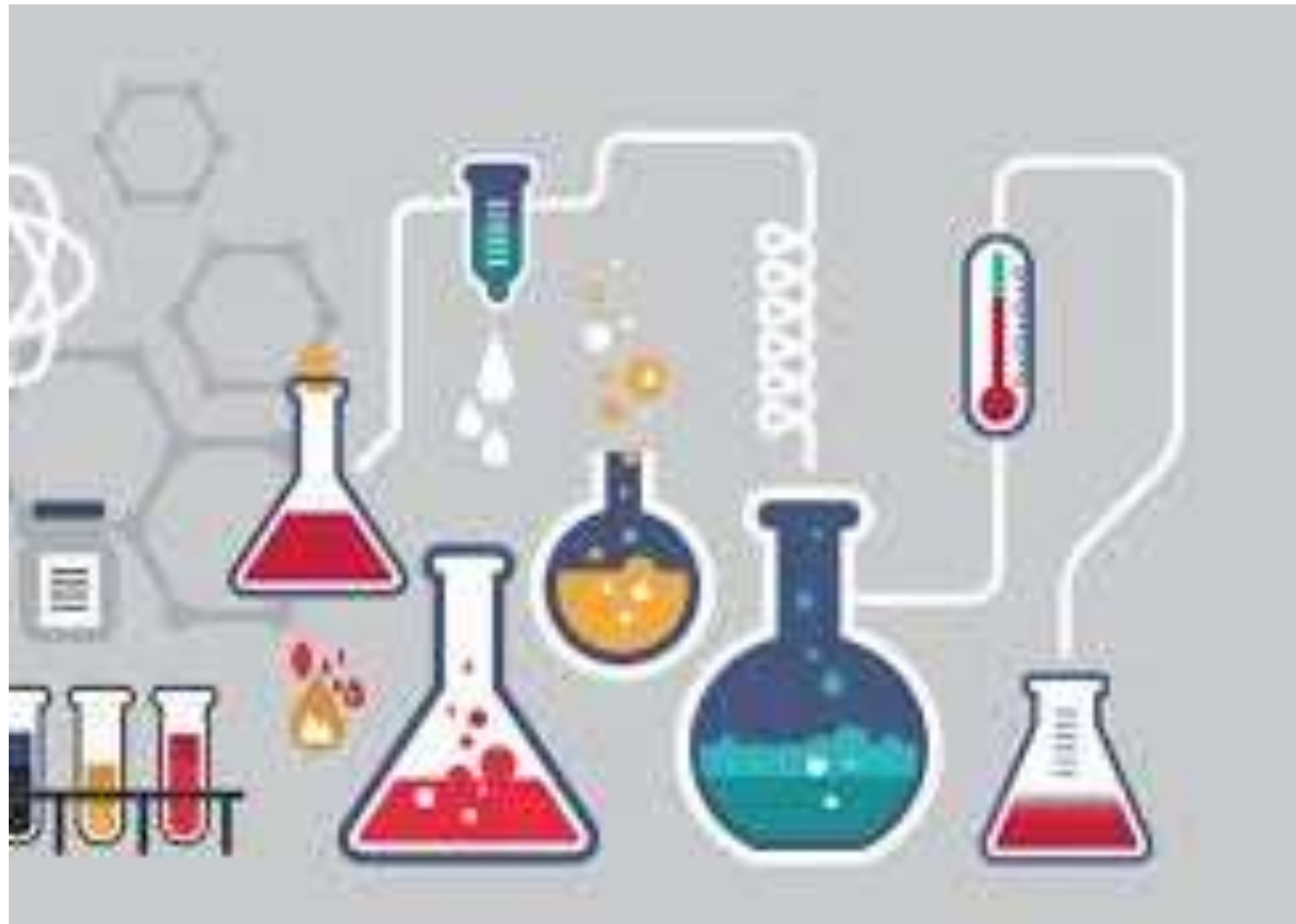
*Rossana Silva Repetto, Executive Secretary*

*Minamata Convention Secretariat*

**ICMGP 2019**

**Krakow, Poland, 8-13 September 2019**





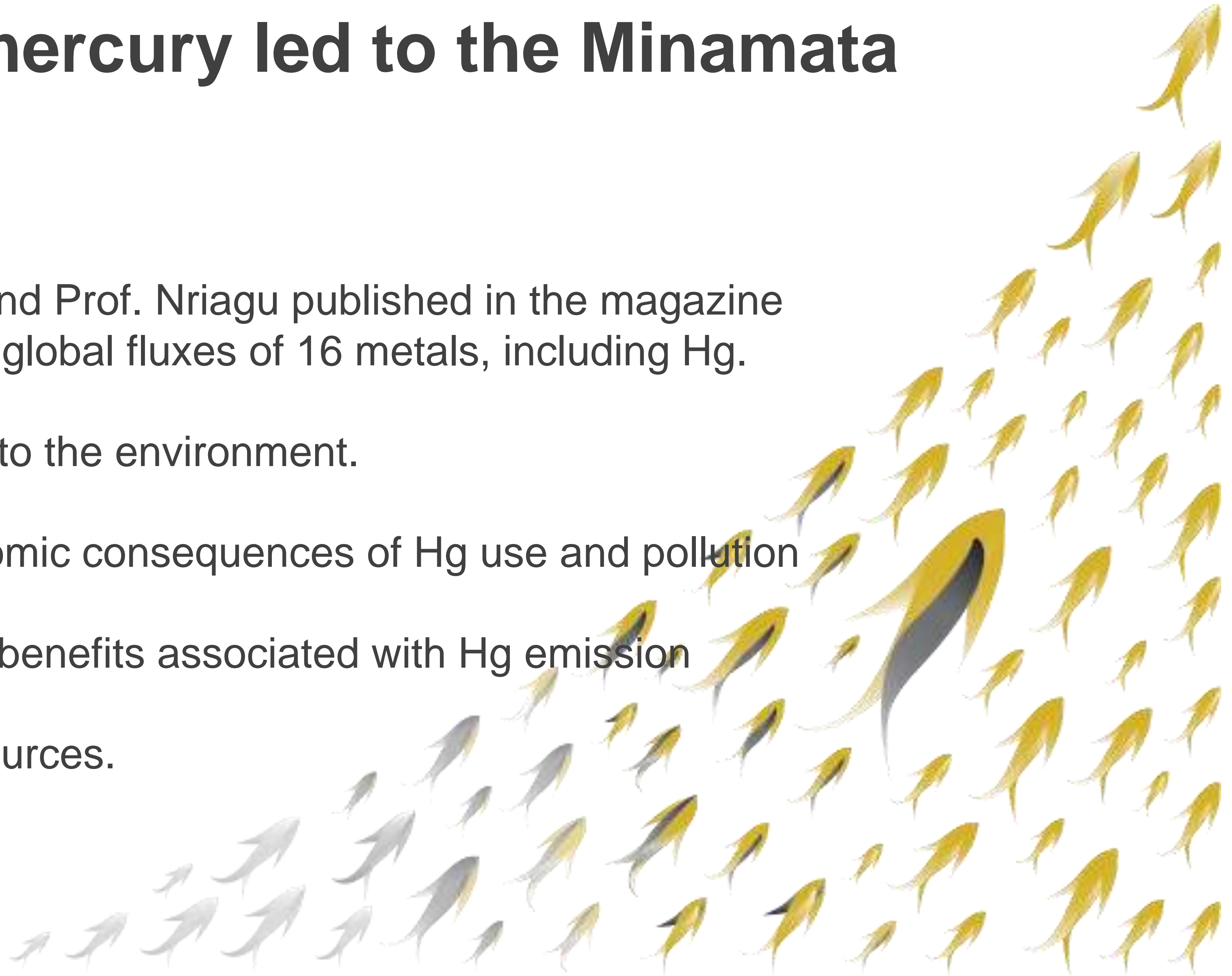
**Global mercury  
scientific research and  
assessments translated  
into policy**





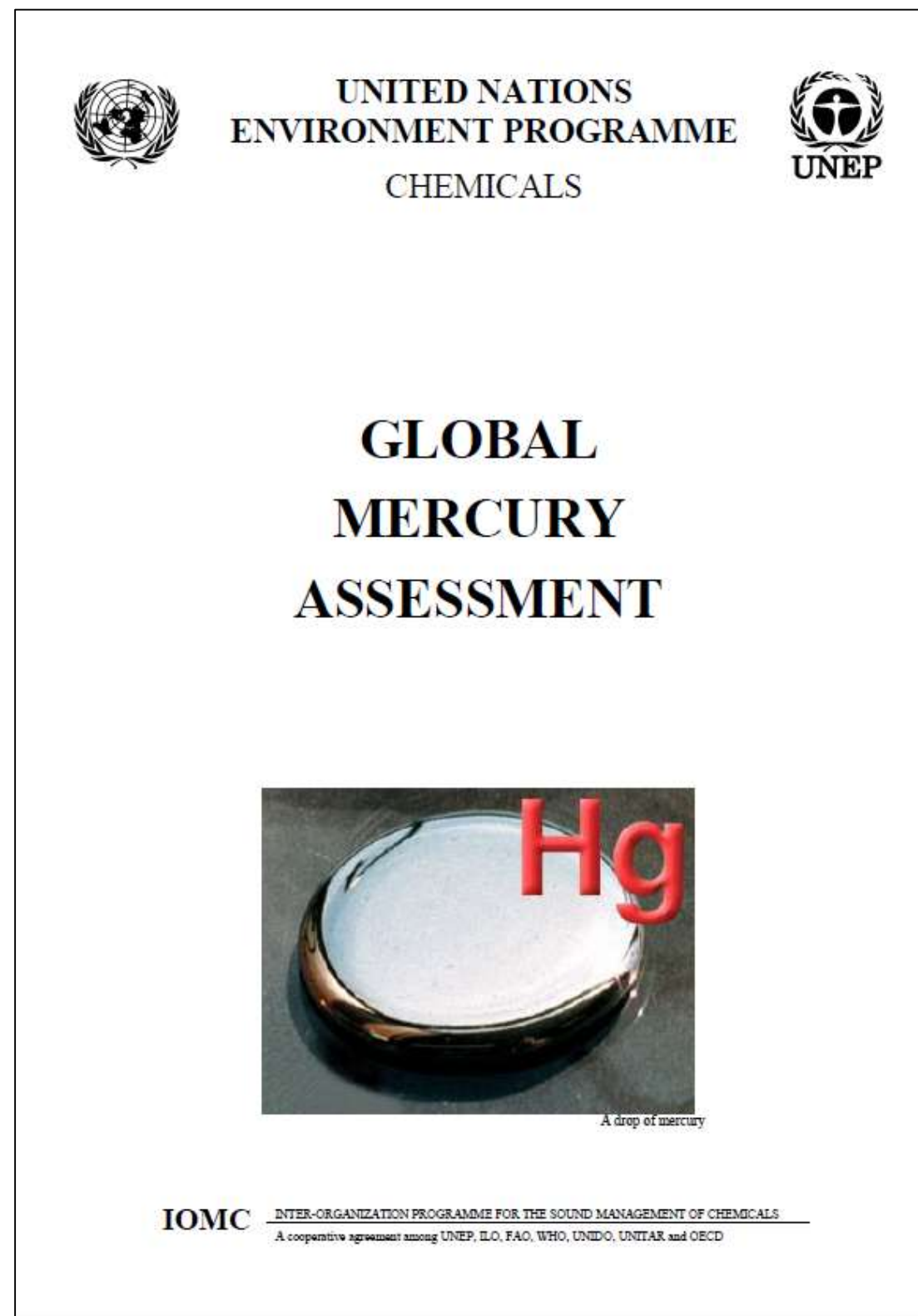
# Research on mercury led to the Minamata Convention

- 30 years ago Dr. Pacyna and Prof. Nriagu published in the magazine Nature the first estimate of global fluxes of 16 metals, including Hg.
- Reports on releases of Hg to the environment.
- Studies on the socio-economic consequences of Hg use and pollution
- Assessments of costs and benefits associated with Hg emission from major anthropogenic sources.

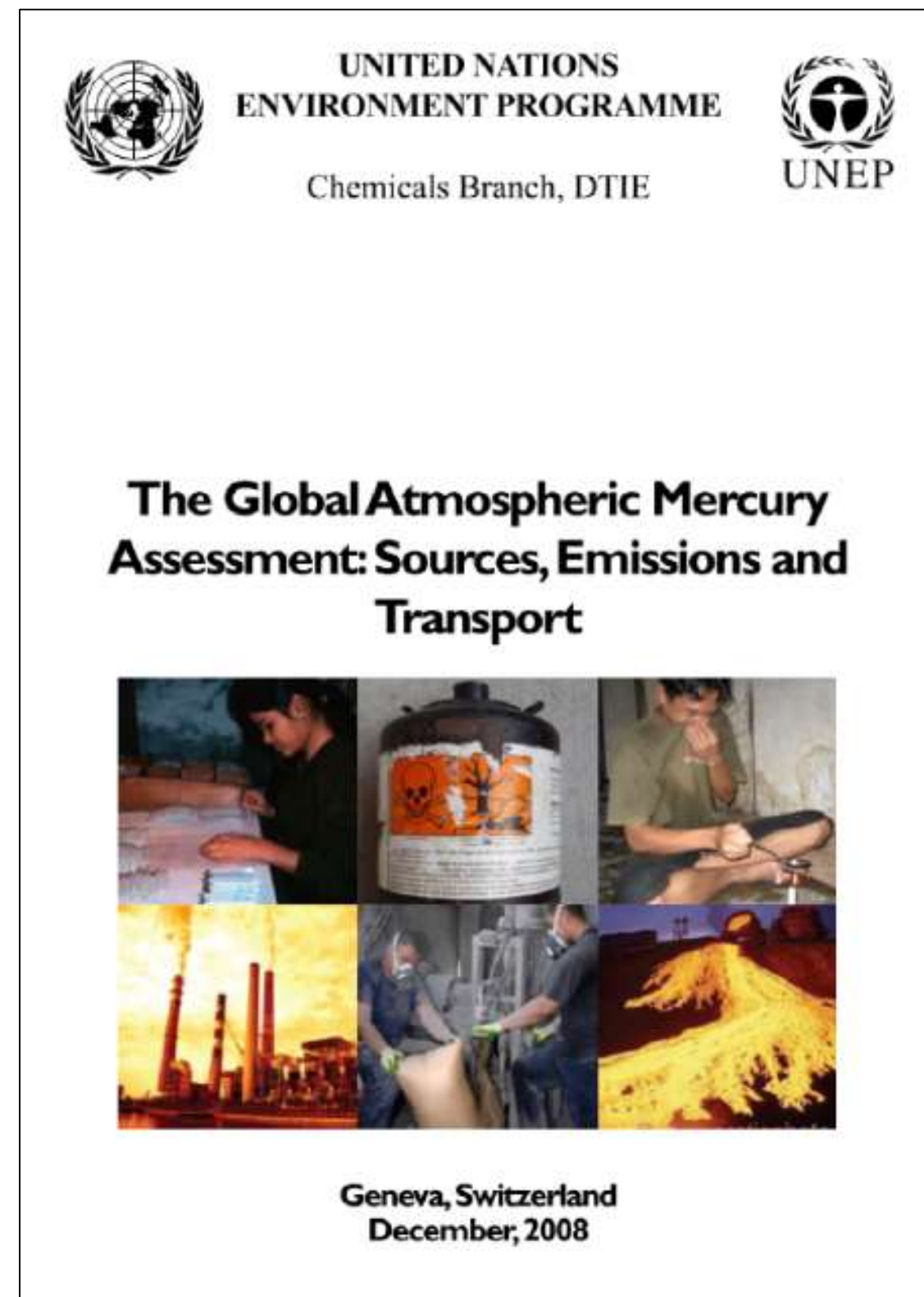




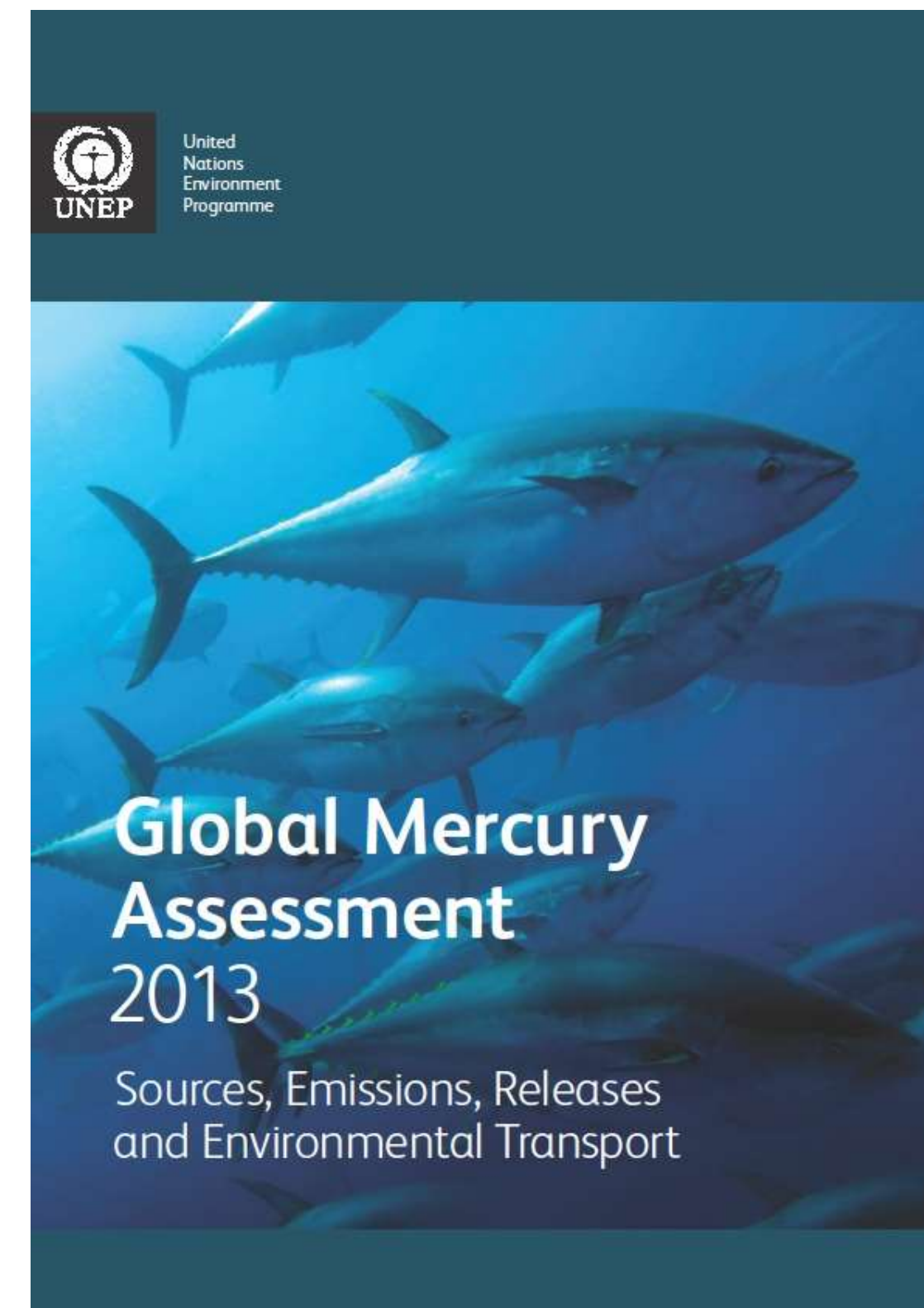
# Global Mercury Assessments



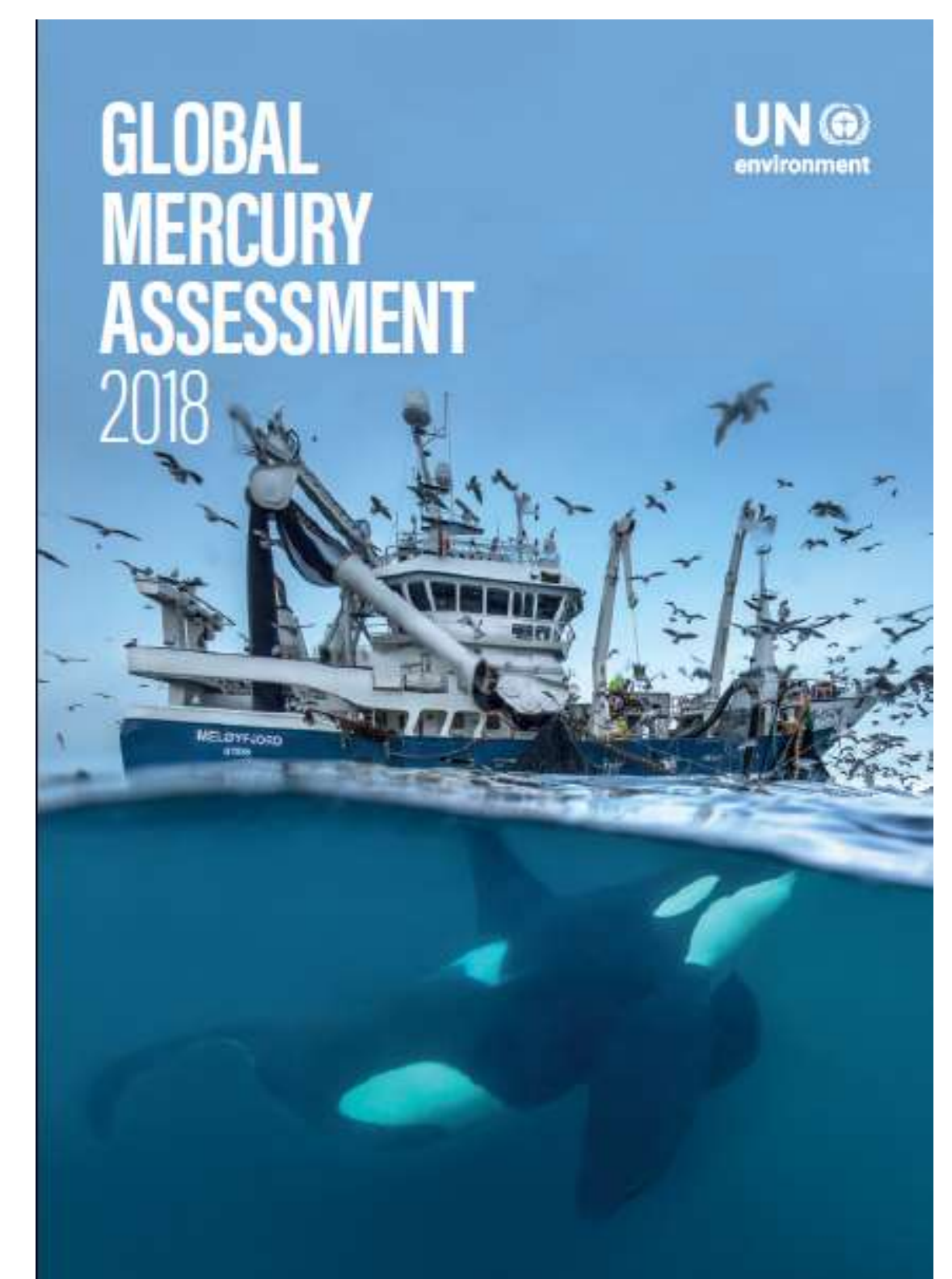
2002



2008



2013



2018

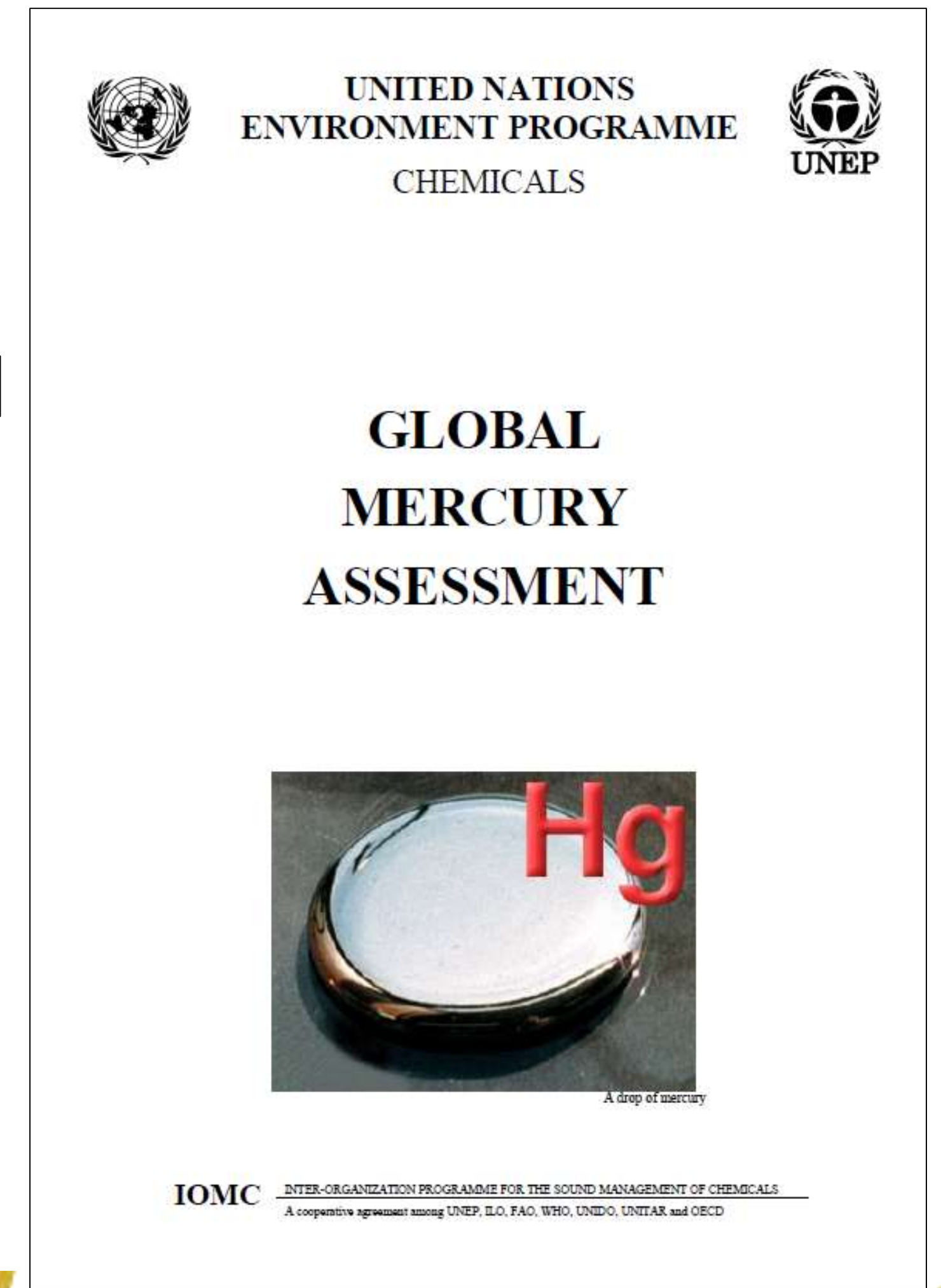




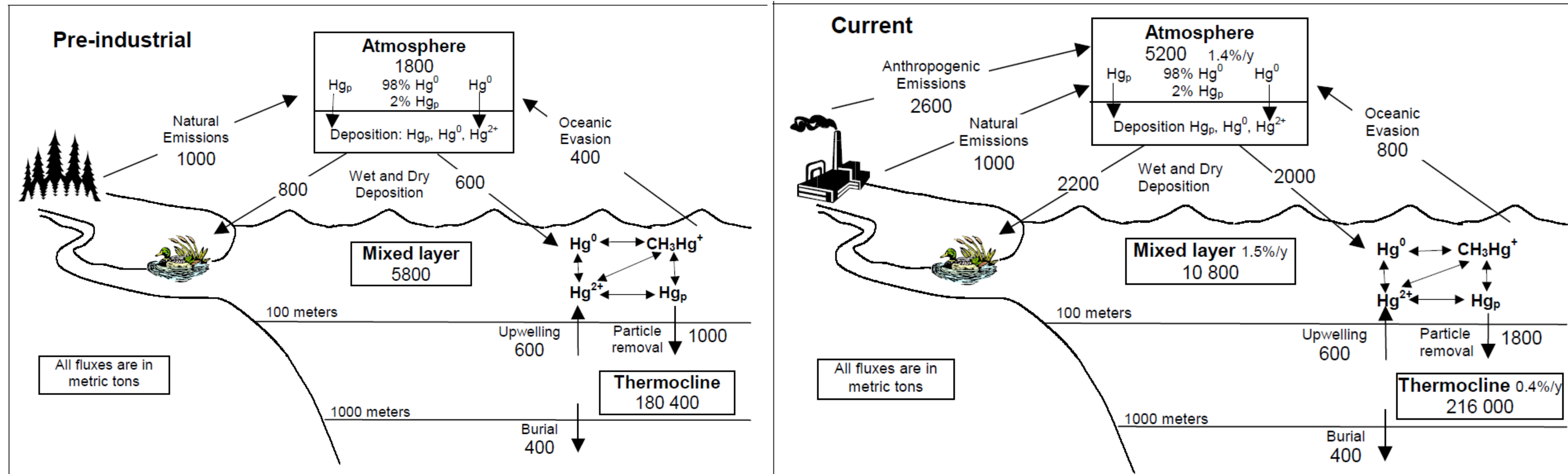
# Global Mercury Assessment 2002

## UNEP Governing Council in 2003:

- Accepted the key findings of the assessment and found that there was sufficient evidence of significant global adverse impacts from mercury to warrant further international action.
- Decided that national, regional and global actions, both immediate and long-term, should be initiated as soon as possible to protect human health and the environment.



# Global Mercury Assessments 2002–2018: Global cycle

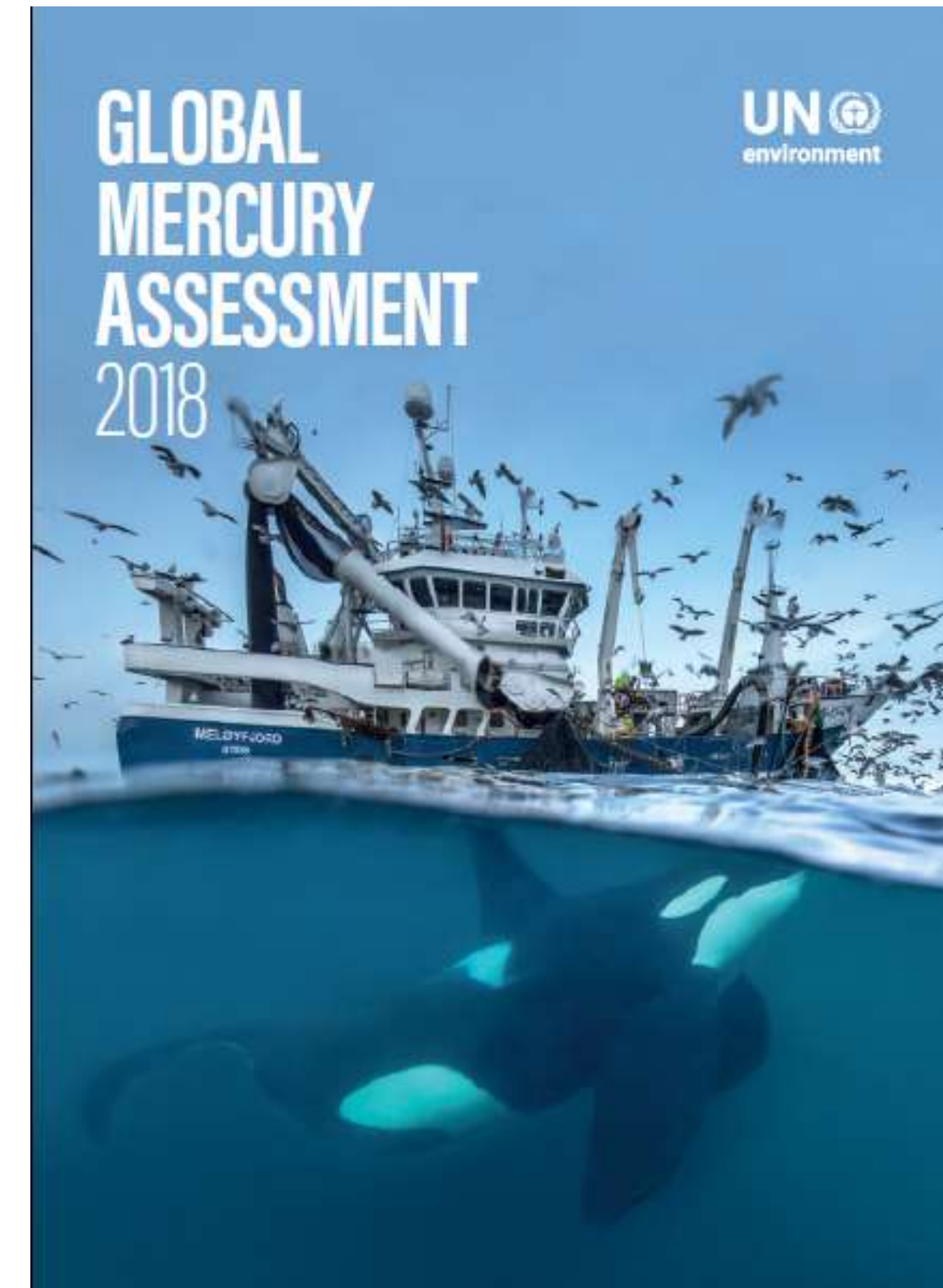


- GMA 2002 estimated that the level of global mercury cycle was about three times that of the pre-industrial era level.
- GMA 2018 estimates a global mercury level 5.5 times higher than what it should be without human activities, i.e., at its natural level.



# Global Mercury Assessment 2018 – Key messages

- A new global inventory of Hg emissions to air from anthropogenic sources in 2015 quantifies global emissions from 17 key sectors at about 2220 tons.
- Emissions patterns in 2015 were very similar to those in 2010.
- Estimated global anthropogenic emissions of Hg to the atmosphere for 2015 were 20% higher than they were in updated estimates for 2010.
- Stationary combustion of fossil fuels and biomass is responsible for about 24% of the estimated global emissions, primarily from coal burning (21%).
- Human activities have increased total atmospheric Hg concentrations by about 450% above natural levels.
- The re-emission of mercury from land and sea originates from historical anthropogenic emissions.





## Key messages cont'd



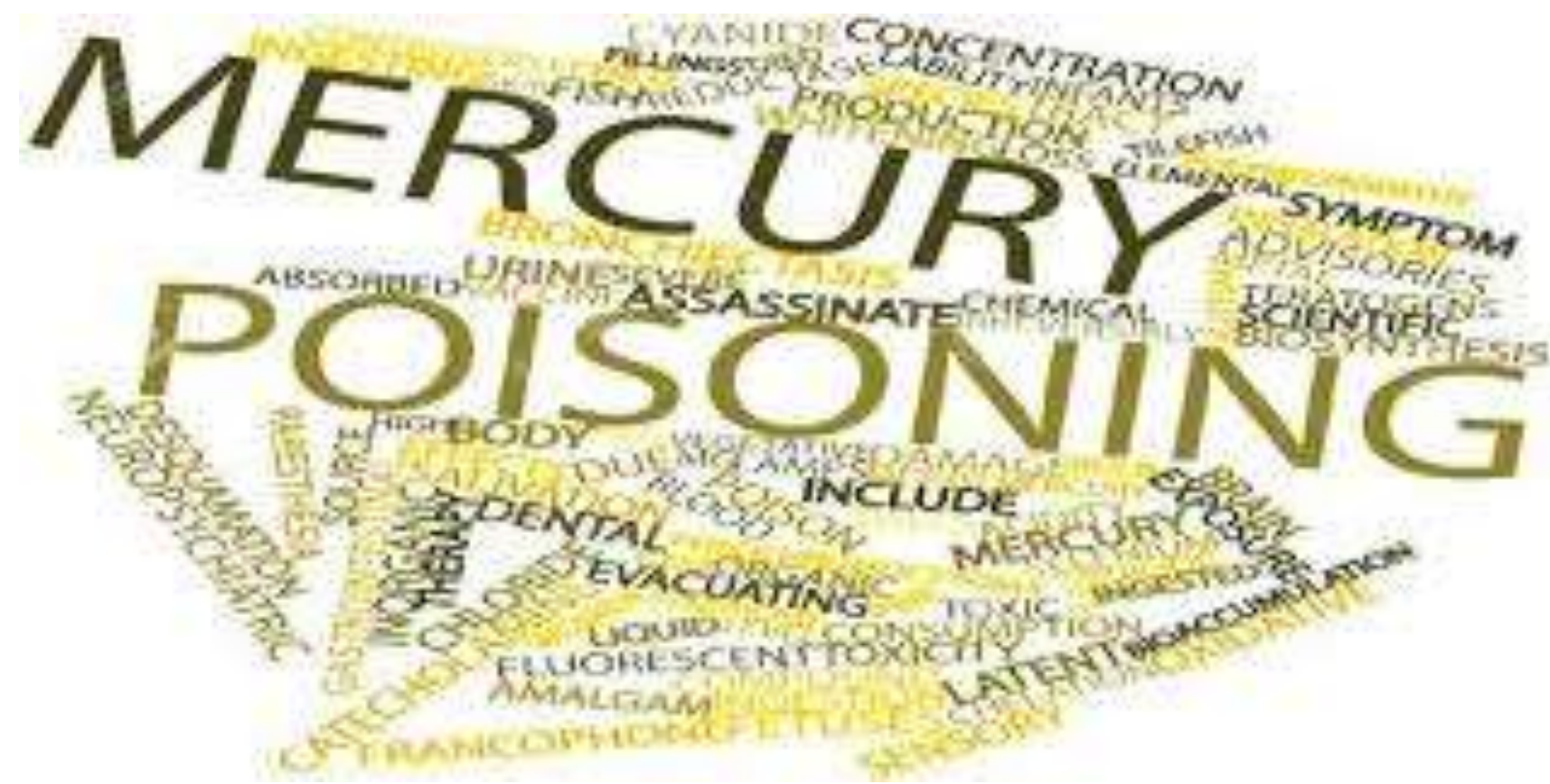
- ASGM introduced about 1220 tons of mercury into the terrestrial and freshwater environments in 2015.
- Reductions in Hg emissions and resulting declines in atmospheric concentrations may take time to show up as reductions of Hg concentrations in biota.
- Natural production of methylmercury in the oceans and in some lakes is often not limited by the input of inorganic Hg.
- Mercury loads in some aquatic food webs are at levels of concern for human and ecological health.
- All people are exposed to some amount of Hg.





*Mercury pollution is a global problem and thus requires global action. Mercury is emitted in the air and is transported very long distances in the atmosphere.*

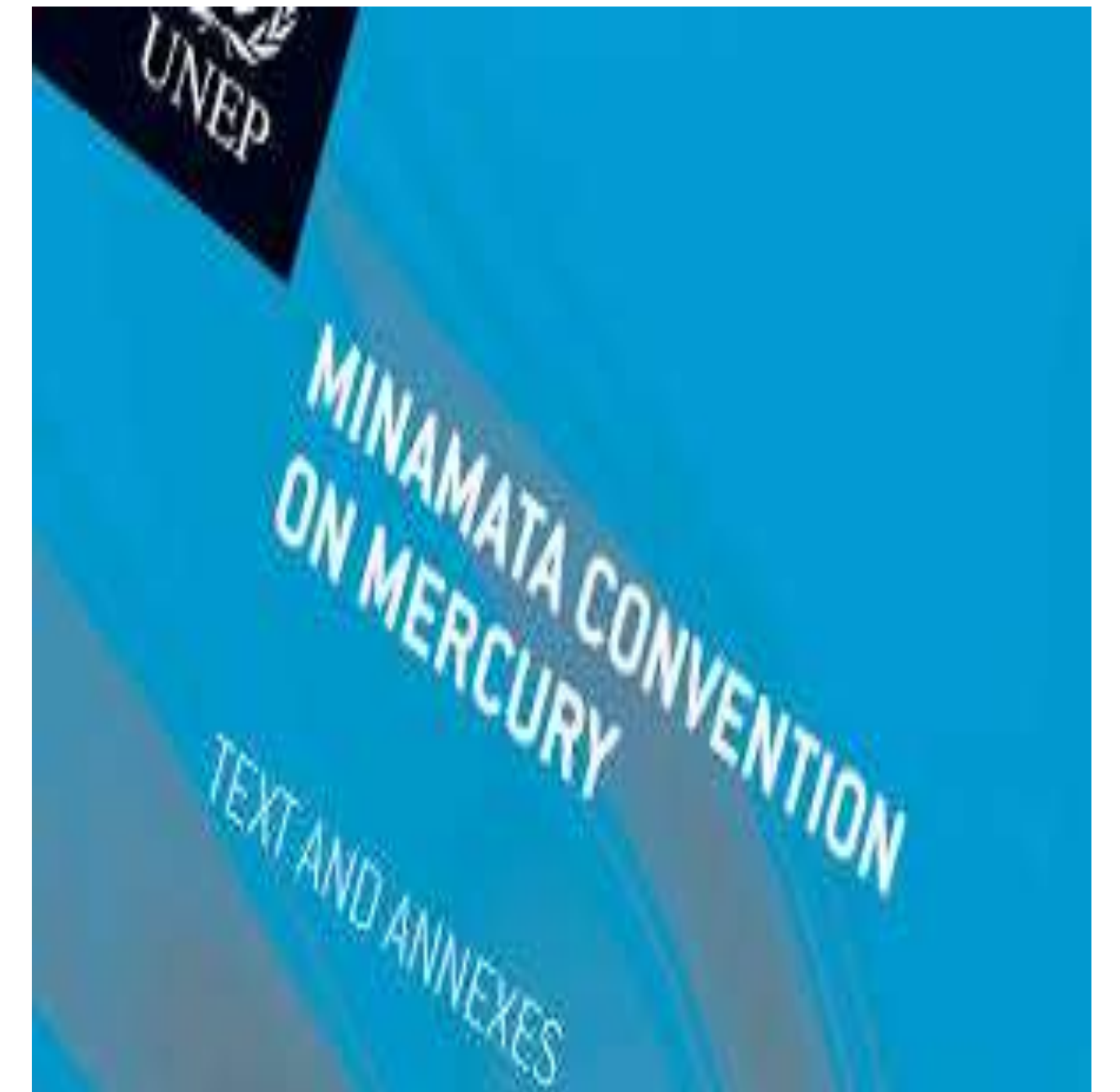
*Mercury is also released in water and soil, and do not respect geographical or political borders.*





# Action taken by the UNEP Governing Council

- In Feb 2009 adopted the historical decision agreeing to develop a legally-binding instrument to fight against mercury pollution.
- The Intergovernmental Negotiating Committee (INC) was established, and expeditiously worked over five sessions: The text was agreed at INC 5, in Jan 2013, after only 4 years of negotiations and 5 INC meetings.





# Minamata

Conference of Plenipotentiaries  
on the Minamata Convention  
on Mercury



2013  
Oct.7<sub>Mon.</sub> → 11<sub>Fri.</sub>



think! H<sub>g</sub> free world

Organized by United Nations Environment Programme

Host Nation Japan

Preparatory Meeting<sup>1</sup> Oct.7<sub>Mon.</sub> → 8<sub>Tue.</sub>

Conference of Plenipotentiaries

• Ceremonial Opening Oct.9<sub>Wed.</sub>

• Adoption and Signing Oct.10<sub>Thu.</sub> → 11<sub>Fri.</sub>

Many people, including the representatives of the governments and NGO's from about 140 nations, will be expected to participate. Your cooperation towards the success of the conference will be greatly appreciated.

Special Minamata Card



**The Minamata Convention  
was adopted in Kumamoto,  
Japan, by a Conference of  
Plenipotentiaries in October  
2013**





The Minamata Convention is a demonstration of the power that the international community, when determined to act together, can show.



Through the INC, governments, international organisations, industry, the private sector, NGOs, academia and civil society at large, overcame their differences and acted united towards a common objective of global benefit, i.e., *to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.*





**The Convention  
entered into force  
on 16 August 2017**

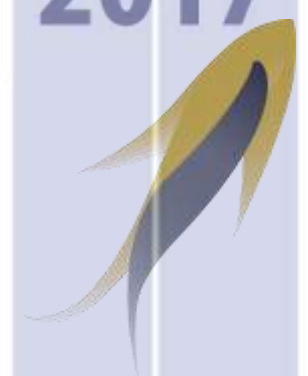


**August 16, 2017**  
**The Minamata Convention on Mercury  
went into effect**





2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017



# Adoption of the Minamata Convention

UNEP GC 25

Diplomatic Conference

INC 6

INC 7

INC1 - INC 5

Intergovernmental Negotiating Committee

COP / 1

UNEP GC 24

UNEP Global Mercury Partnership

Global Mercury Assessment

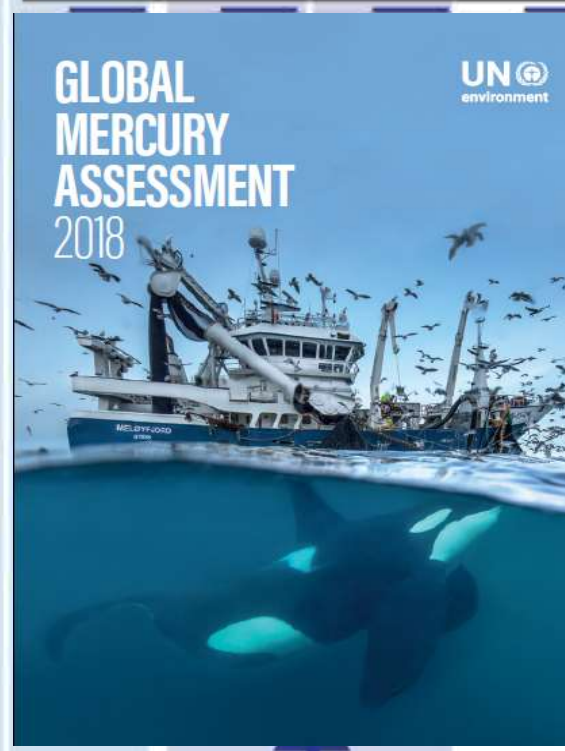
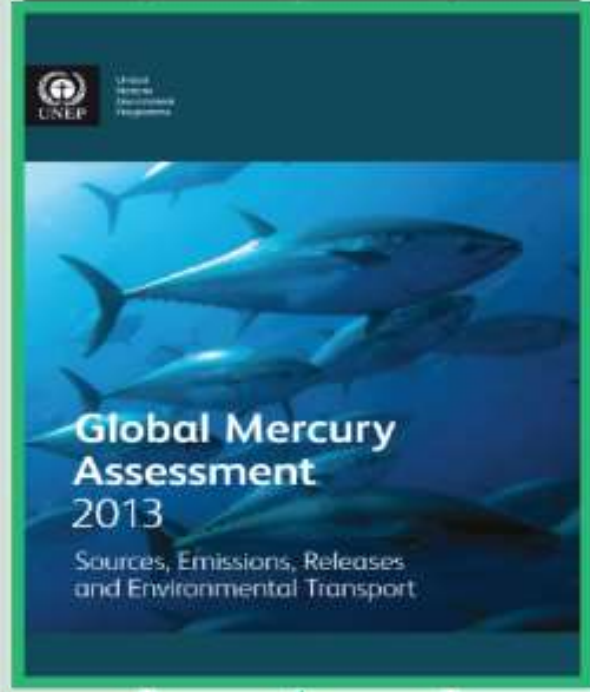
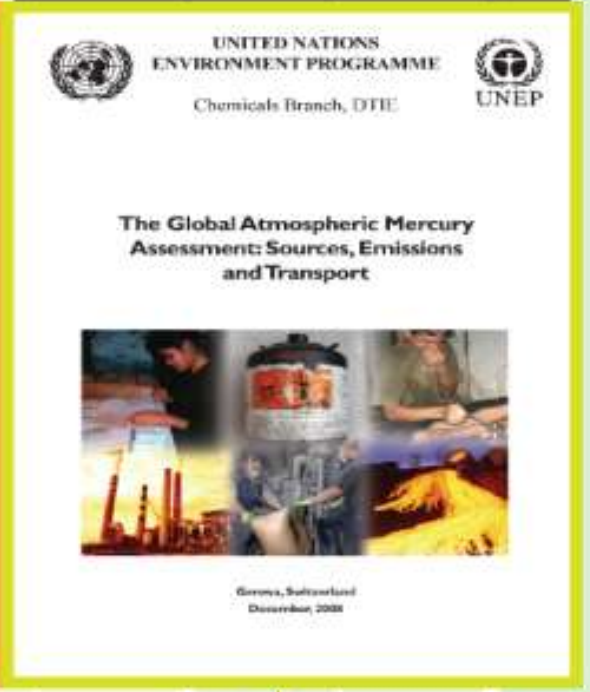
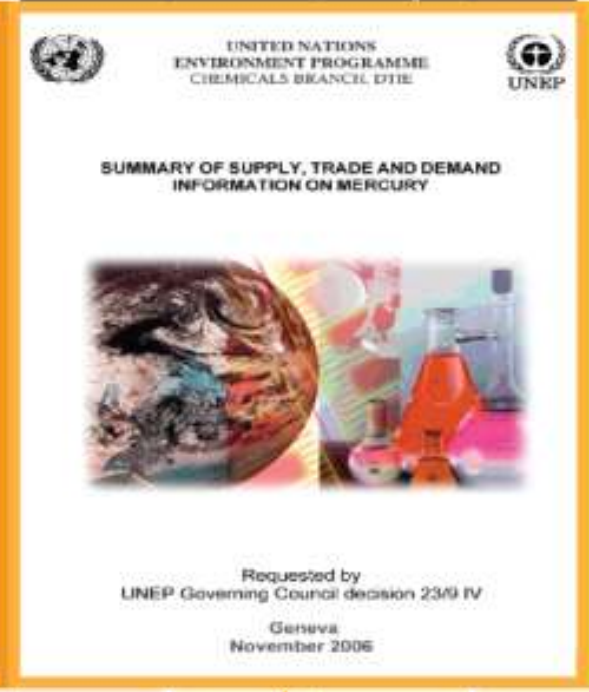
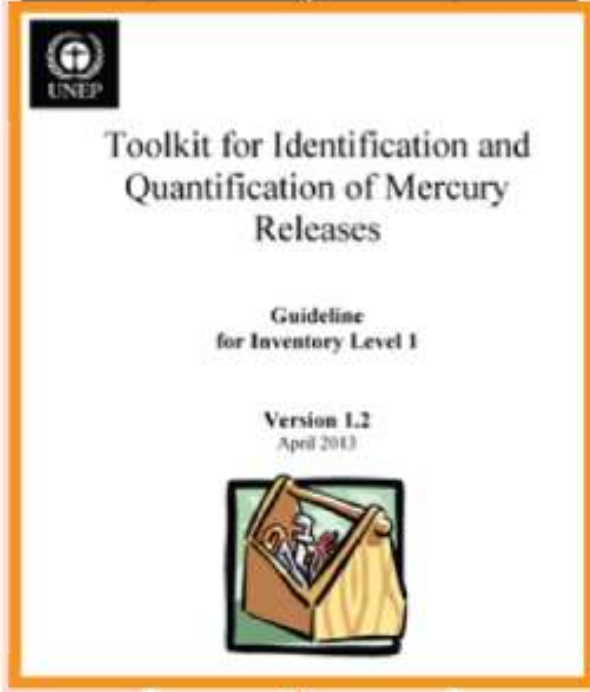
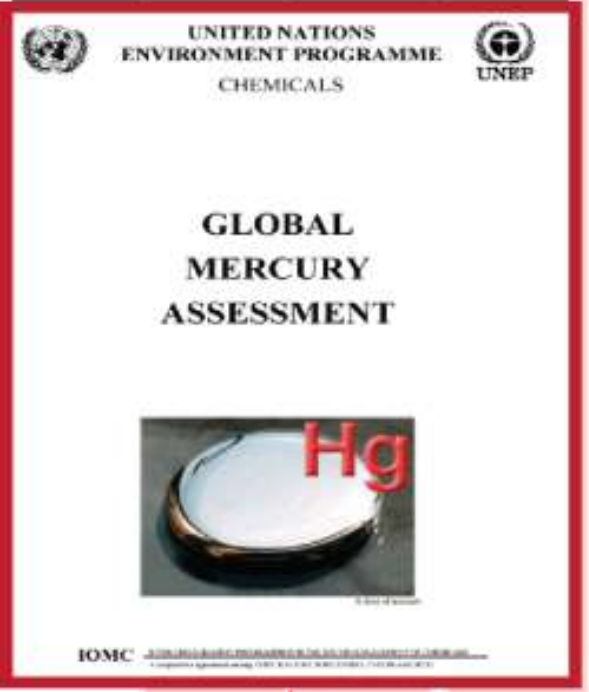
Mercury Inventory Toolkit

Supply, Demand and Trade Report

Global Mercury Assessment

Global Mercury Assessment

Global Mercury Assessment



2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017



FIRST CONFERENCE OF THE PARTIES

# MINAMATA CONVENTION



Geneva, 24-29  
September  
2017



**Second Conference of the Parties (COP-2)-Geneva, 19-23 November 2018**

**Third Conference of the Parties (COP-3)-Geneva, 25-29 November 2019**



International  
Conference Centre  
Geneva





**The Convention aims at addressing the devastating effects of mercury by tackling this natural element throughout its life cycle.**







**The Minamata Convention addresses the whole life cycle of mercury**

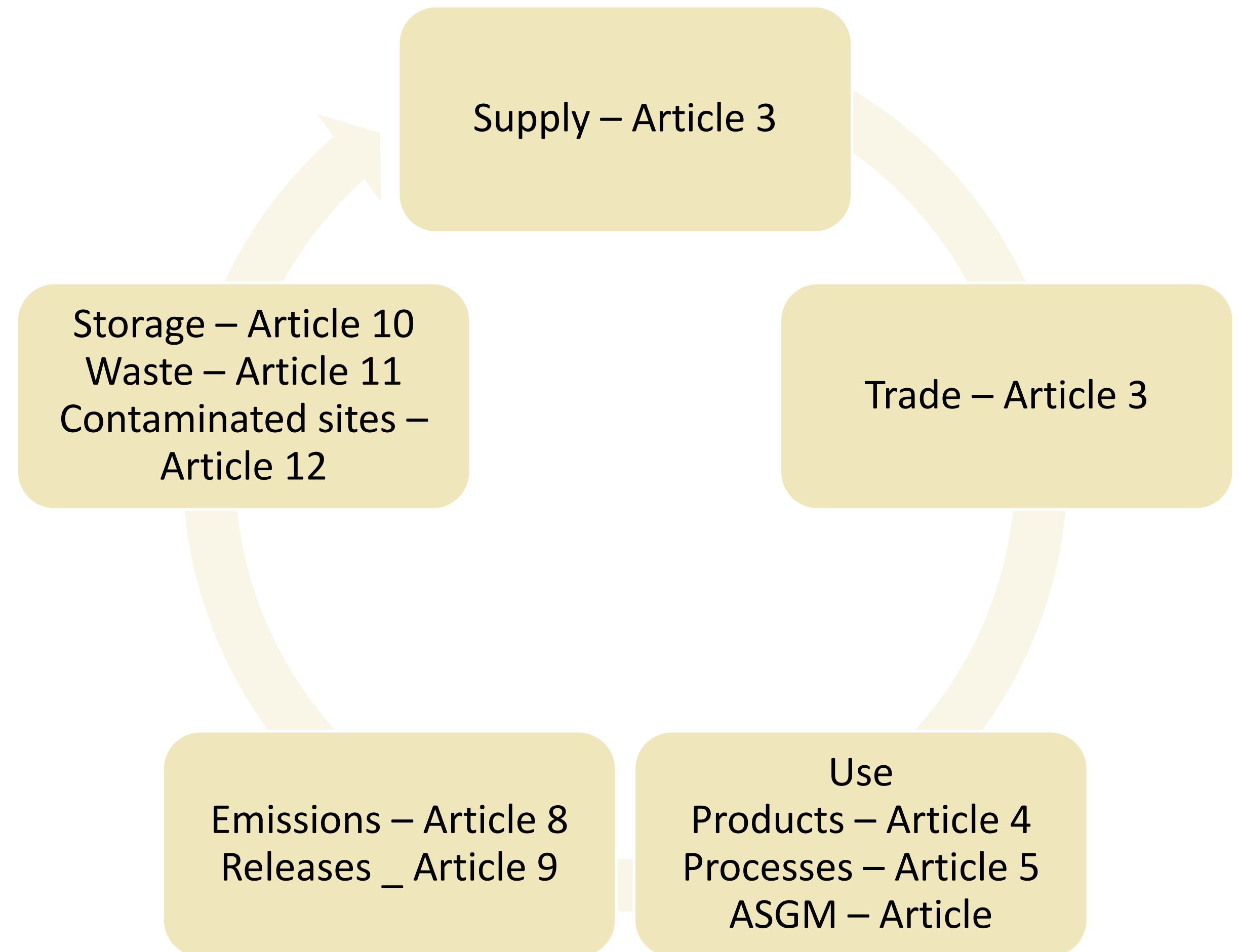
**Scientific and technical knowledge is essential in managing each step of the mercury life cycle**





# Minamata Convention on Mercury

- **Provisions cover the entire life cycle of mercury**, including supply, trade, mercury-added products, industrial processes using mercury, ASGM, emissions to air, releases to land and water, interim storage, waste and contaminated sites.





# Article 3: Mercury supply sources and Trade



**Parties shall not allow primary Hg mining** that was not conducted within its territory when the Convention entered into force for them.

**Parties shall dispose of excess Hg from decommissioning of chlor-alkali facilities** in accordance with the guidelines on environmentally sound management developed under the Basel convention.

**The provision regulates import and export of Hg.**

Regional workshops on mercury trade planned in 2019. First one in La Paz, Bolivia.



# Article 4: Mercury-added products



**Parties shall not allow manufacture, import or export** of mercury-added products in part I of Annex A after the phase out date (2020, which may be extended to 2025)

- Batteries
- Switches and relays
- Lamps
- Cosmetics
- Pesticides, biocides and topical antiseptics
- Measuring devices (barometers, hygrometers, manometers, thermometers, sphygmomanometers)

**Parties shall take measures** for products in Part II of Annex A

- Dental amalgam



# Article 4: Mercury-added products



## **COP-3 in November 2019 will consider:**

- Review of annexes A – to be undertaken by COP no later than five years after the entry into force of the Convention
- Proposal to amend annex A – proposed by a group of parties
- The use of Harmonized System codes to distinguish mercury-added products and non-mercury-added products



# Article 5: Manufacturing processes



Controls the **manufacturing processes** using mercury.

- Phase out the use of mercury in **chlor-alkali production** by 2025
- Phase out the use of mercury in **acetaldehyde production** by 2018
- **Vinyl chloride monomer production**: reduce the use of mercury in terms of per unit production by 50 per cent by the year 2020 against 2010 use;
- **Sodium or potassium methylate or ethylate and production of polyurethane**: take measures to reduce the use of mercury aiming at the phase out of this use as fast as possible and within 10 years of the entry into force



# Article 8: Emissions



Controls the **emissions** of total mercury 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.

Each party shall address **new and existing emission sources** no later than 5 and 10 years after the entry into force respectively.

Each Party shall establish and maintain an **emissions inventory**.



# Article 8: Emissions

- The Conference of Plenipotentiaries in 2013 established a group of technical experts to develop the guidance on best available techniques (BAT), best environmental practices (BEP) and emission inventory.
- The guidance was adopted by COP-1
- Regional workshops on emissions planned in 2019-2020 – first one in Hanoi, Viet Nam, in October 2019



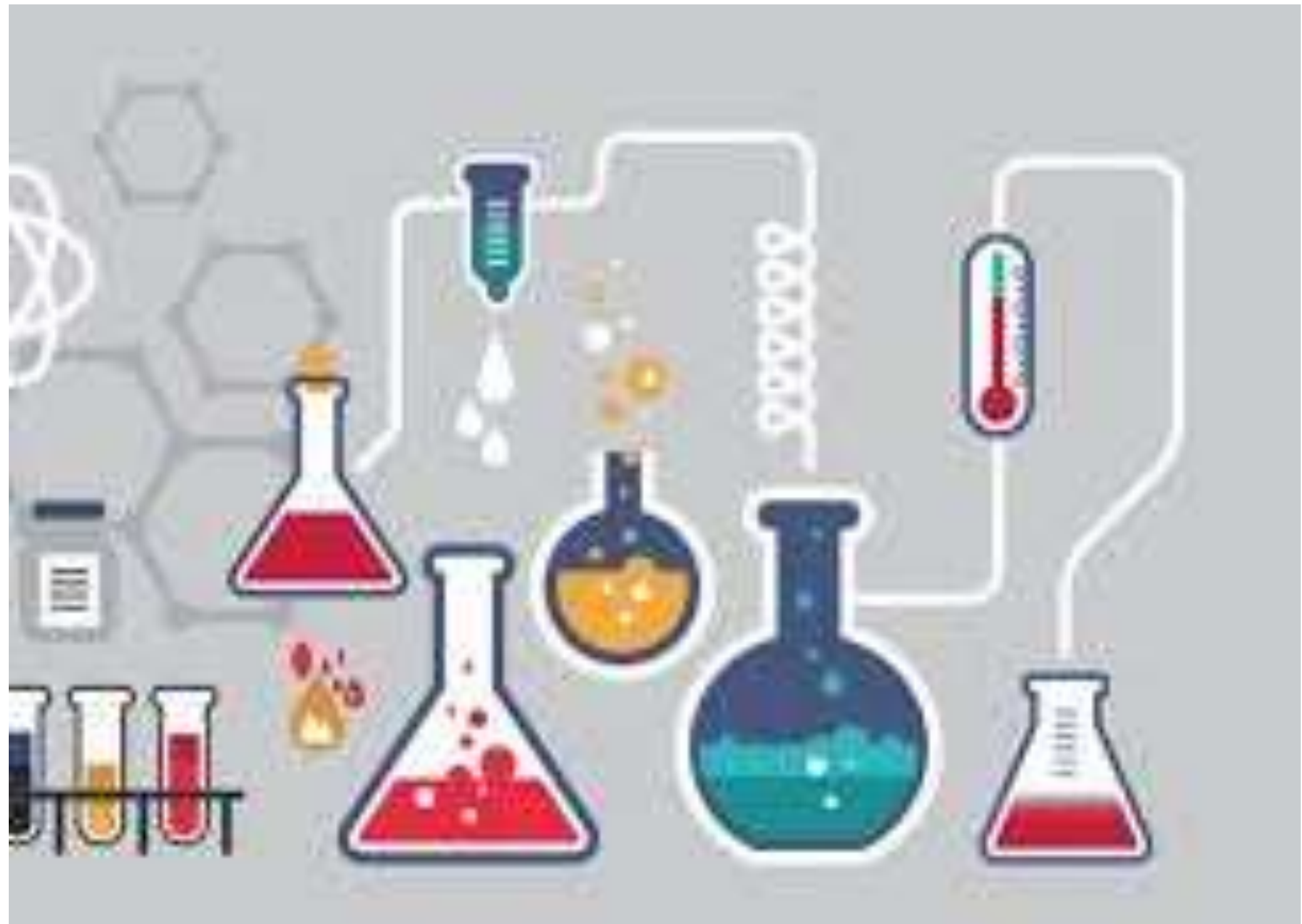


# Guidance under article 8



- BAT/BEP- - Introduction
- BAT/BEP- - Common Techniques
- BAT/BEP- - Monitoring
- BAT/BEP- - Coal-fired power plants and coal-fired industrial boilers
- BAT/BEP- - Smelting and roasting processes used in the production of non-ferrous metals (lead, zinc, copper and industrial gold)
- BAT/BEP- - Waste incineration facilities
- BAT/BEP- - Cement clinker production facilities
- BAT/BEP- - New and emerging techniques
- Support for parties in implementing the measures for existing sources of mercury emissions
- Guidance on criteria that Parties may develop on a relevant source
- Guidance on the methodology for preparing inventories of emissions





**Science is also needed  
to implement the  
Minamata Convention**





## **Intersessional work mandated by COP-2**

- **Releases**
- **Mercury waste thresholds**
- **Contaminated sites**
- **Effectiveness evaluation**



# Article 9: Releases



Article 9 concerns controlling and reducing **releases of Hg and Hg compounds to land and water** from the relevant point sources not addressed in other provisions of the Convention.

COP-2 established a group of technical experts to prepare a **list of any significant anthropogenic point source of release categories**, along with a suggested roadmap and structure for the development of draft guidance on methodologies for preparing its inventories, for possible adoption by COP-3.

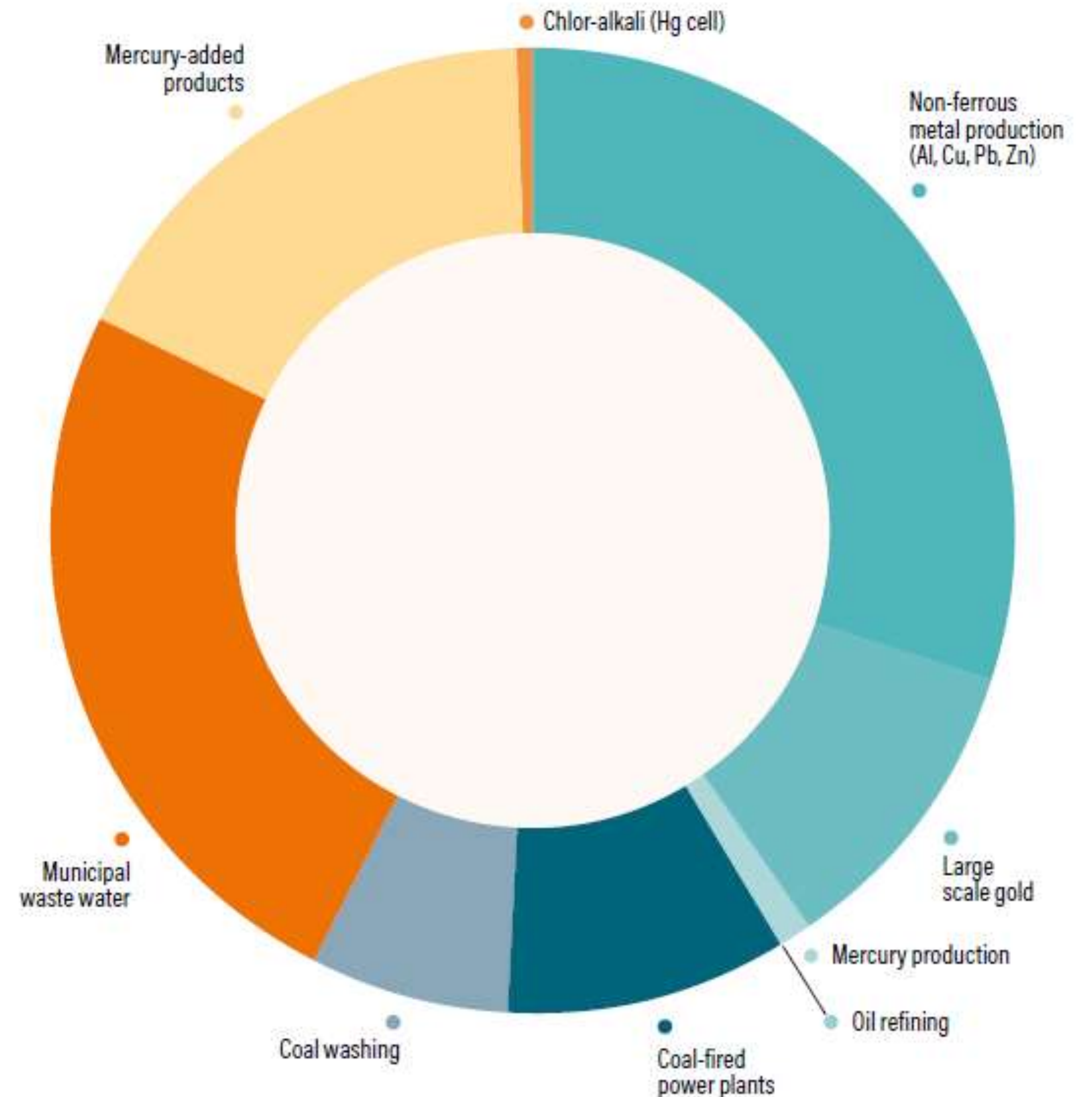


# Article 9: Releases



The Technical Expert Group has developed a preliminary list of potentially relevant point source categories.

As a next step, the group will collect information on methodologies to estimate releases from these sources.





# Article 11: Mercury waste



Each Party shall take appropriate measures so that **mercury waste** is managed in an environmentally sound manner, taking into account the Basel Convention guidelines, and in accordance with requirements that COP shall adopt in an additional annex.

Mercury wastes means substances or objects:

- (a) Consisting of mercury or mercury compounds;
- (b) Containing mercury or mercury compounds; or
- (c) Contaminated with mercury or mercury compounds,

in a quantity above the **relevant thresholds defined by COP** that are, are intended to be, or are required to be disposed of.



# Article 11: Mercury waste



The technical expert group met in Osaka, Japan in May 2019, to develop mercury waste thresholds, to be considered at COP-3.

At the invitation of the Minamata COP, the Basel Convention COP decided in 2019 to review the technical guidelines on environmentally sound management of Hg waste adopted in 2015.





# Mercury waste – report of the expert group



- No need for thresholds for:
  - “waste consisting of mercury or mercury compounds” (comprehensive list developed)
  - “waste containing mercury or mercury compounds”. (end-of-life mercury-added products)
- Threshold using total mercury content should be used for:  
“waste contaminated with mercury and mercury compounds”.



# Article 12: Contaminated sites



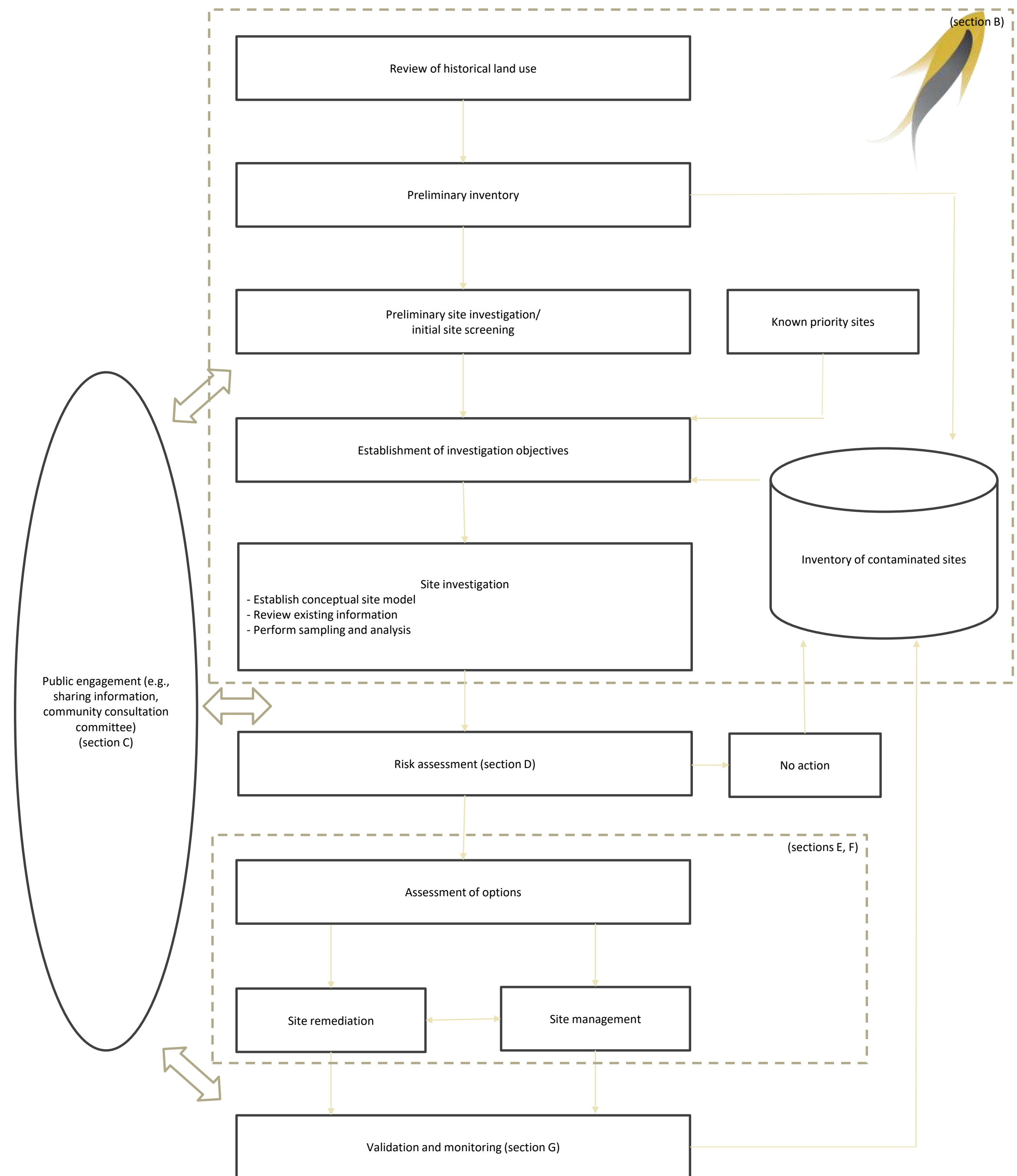
Each Party shall endeavour to develop appropriate strategies for identifying and assessing contaminated sites.

COP-2 requested the Secretariat to call for Parties and stakeholders to submit comments and information to further improve the draft guidance and prepare a revised version for consideration of COP-3.



# Draft guidance on contaminated sites

- Site identification and characterization
- Engaging the public
- Human health and environmental risk assessments
- Options for managing the risks posed by contaminated sites
  - Site management - restricting site access, restricting activities that might mobilize the contamination, etc.
  - Site remediation - soil treatment, water treatment, groundwater treatment, sediment treatment, etc
- Evaluation of benefits and costs
- Validation of outcomes
- Cooperation between and among parties





# Development of technical guidance

	COP-1 (2017)	COP-2 (2018)	COP-3 (2019)
Article 3 (supply and trade)	Guidance and formats on import consent		
Article 4 (Mercury-added produces)			Plan for review of Annex A
Article 5 (Manufacturing processes)			Plan for review of Annex B
Article 7 (ASGM)	Guidance on national action plans		
Article 8 (Emissions)	Guidance on BAT/BEP and inventory		
Article 9 (Releases)			List of relevant sources
Article 10 (Interim storage)		Guidance	
Article 11 (Mercury waste)			Mercury waste thresholds
Article 12 (Contaminated sites)			Guidance





# Article 22: Effectiveness evaluation

The COP shall evaluate the effectiveness of the Convention, beginning no later than six years after the date of entry into force of the Convention (i.e., 2023 – COP-5) and periodically thereafter at intervals to be decided by it.

COP-1 established an ad-hoc expert group to discuss the effectiveness evaluation framework and global monitoring arrangements.

COP-2 extended the ToR of the group amending its mandate and membership.





# Effectiveness evaluation

The group met twice, in March 2018 and April 2019.

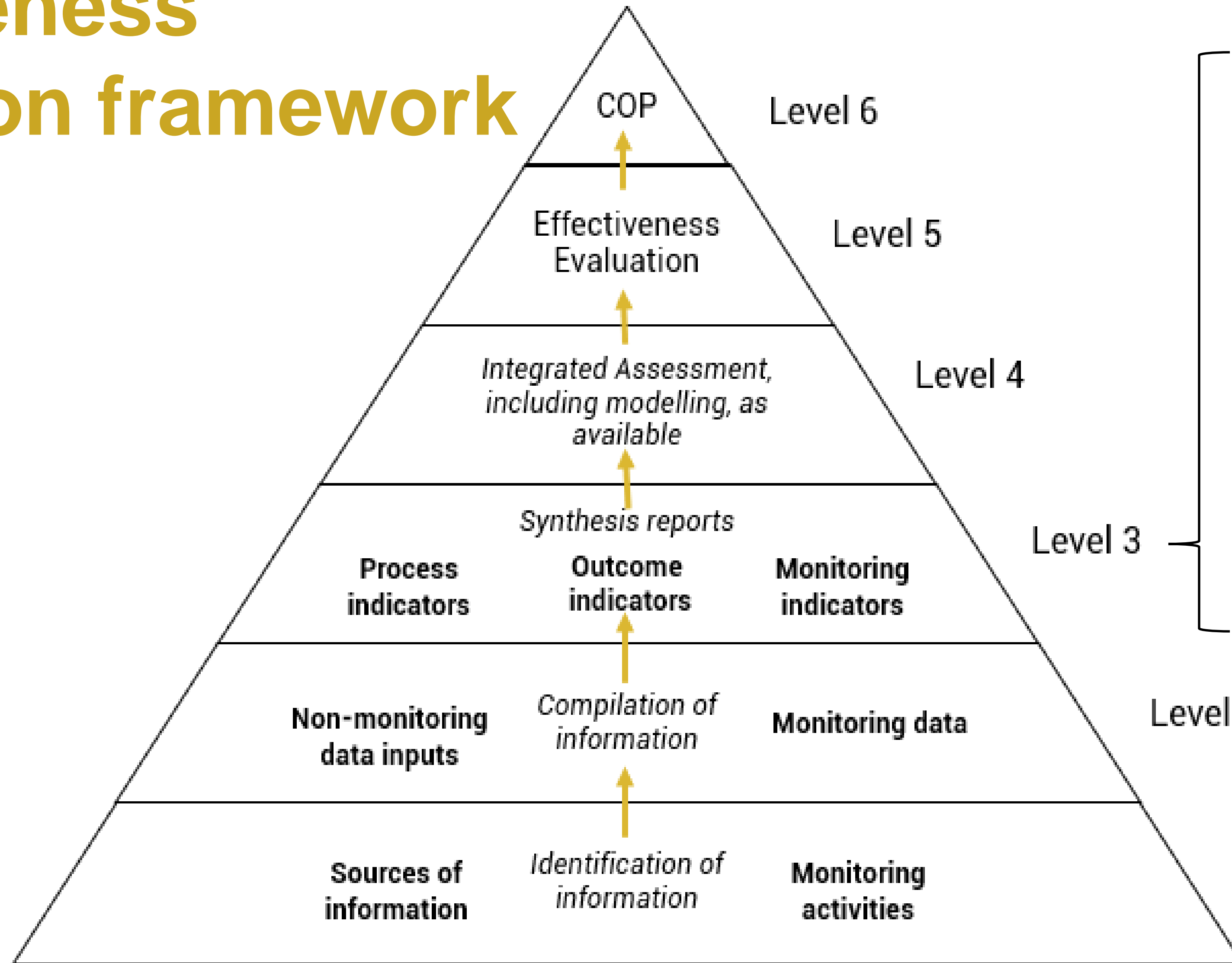
Has prepared a Draft Report, which was available on the Convention website for comments until 5 September 2019.

The current proposal is that four “synthesis reports” will be developed by collecting and analyzing scientific and technical information.





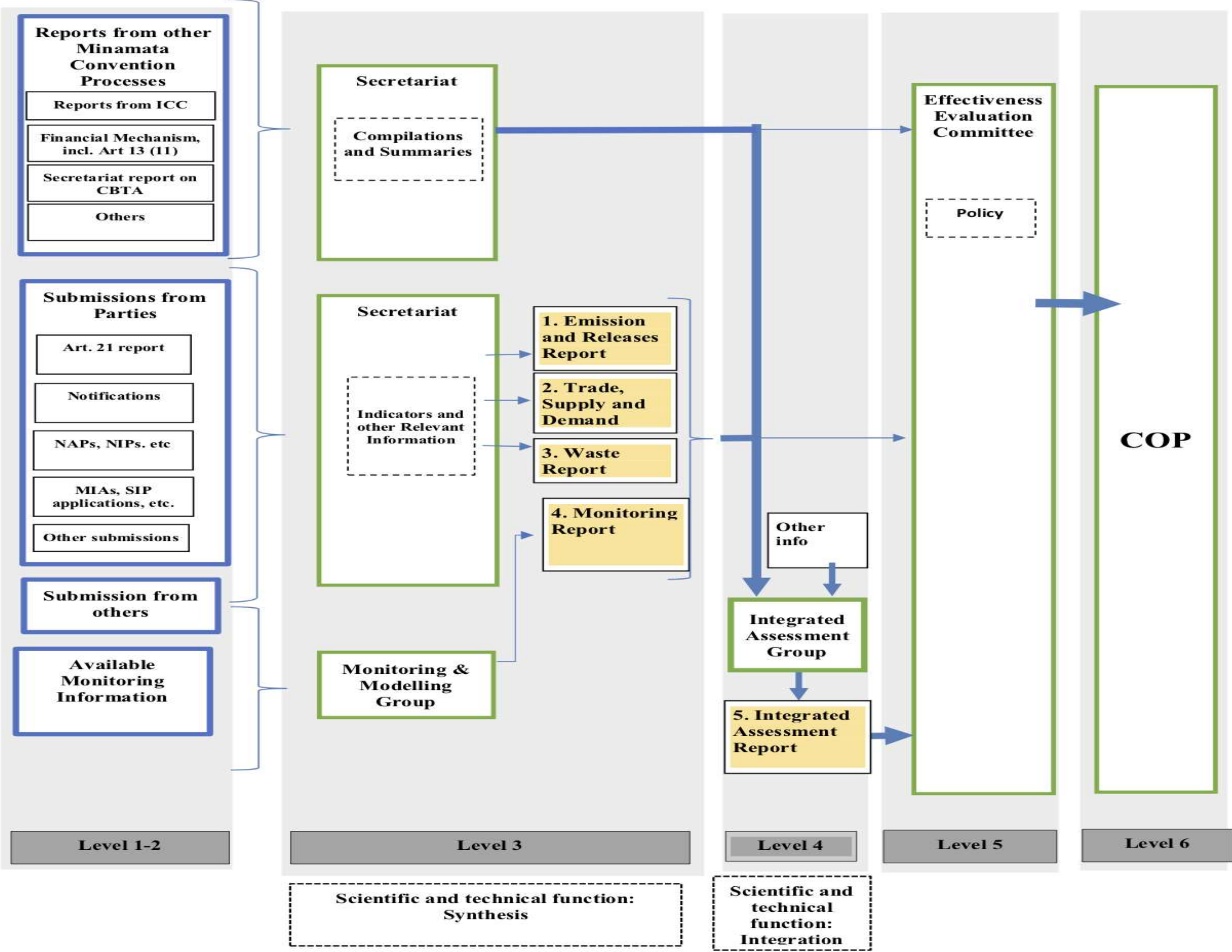
# Effectiveness evaluation framework



- Global Monitoring Report;
- Emissions and Releases Report
- Trade, Supply and Demand Report
- Waste Management Report



# Effectiveness evaluation – how the information is compiled and assessed





# Report of the ad-hoc technical expert group



## - Monitoring

- The ad hoc group concluded that data on levels of mercury in air, biota and humans either are available or would be able to be obtained and comparable on a global basis.
  - Air: Available sampling techniques are considered suitable to obtain globally comparable data, including Total Gaseous Mercury (TGM) or Gaseous Elemental Mercury (GEM) concentrations and wet deposition
  - Human: Assessment of prenatal exposure is recommended because the fetus is the most vulnerable to methyl mercury exposure. Two main biomarkers are total mercury in maternal scalp hair and total mercury in cord blood.
  - Biota: four major biomarker groups (taxa) are considered the most relevant and are most frequently used for methyl mercury monitoring: fish, sea turtles, birds and mammals
- Water
  - Levels of mercury and mercury compounds in water are collected in a number of countries. These data may be useful in tracking mercury resulting from local activities which release mercury; however, it will not provide overall trends on a global basis.
  - Levels of mercury in ocean water could be comparable on a global basis and collected by existing networks and ad hoc research programmes, but currently such work is done through research-based activities and not dedicated long-term monitoring programmes



# Report of the ad-hoc technical expert group

## - Modelling

- **Models for different media** (air, water, land, biota) vary in their ability and state of development.
  - **Atmospheric models** have been extensively evaluated and can be applied to assess spatial gradients in atmospheric mercury concentrations and deposition, as well as temporal changes.
  - Models for other media such as land are still mainly used in research applications.
- At present, **integrated modeling frameworks** are under development and available as a research product. They have not previously been applied in global assessment efforts.
  - Atmosphere-ocean and atmosphere-terrestrial should be available to begin policy-relevant analyses by 2023.
  - Models for food web bioaccumulation of methylmercury are also available from selected groups and can be used to describe accumulation patterns at the ecosystem and for global marine food webs.
  - The most difficult link in integrated modeling frameworks is to human exposure and health outcomes due to the diversity of diet and individual variability in toxicokinetics.









# National priorities described in MIA reports

101 countries have conducted or are conducting MIAs with GEF support. Initial results show:

- Most countries prioritize products (Article 4) and wastes (Article 11)
- Many countries also prioritize ASGM (Article 7) and emissions (Article 8)
- Some countries prioritize releases (Article 9), health aspects (Article 16), awareness raising (Article 18) and research and monitoring (Article 19)





# Capacity Building Gaps identified through the SIP

Applicant countries have prioritized the need to:

- Strengthen institutional capacity and legal frameworks (address lack of data on mercury emissions, releases and mercury-added products)
- Train stakeholders to build capacity, to conduct research activities, to develop technical guidelines and to prepare for strengthening legal and institutional frameworks.
- Support public awareness-raising and education on the negative impacts of Hg
- Strengthen the legal framework and develop implementation plans specifically on Hg waste management.



In addition to national projects in accordance with the COP guidance, the MIAs and NAPs on ISGM, the GEF has started two global programmes:

- **1. GEF GOLD: Global Opportunities for Long-term Development in ASGM**

- Funded by the GEF) and led by UNEP. Implemented by Conservation International, UNDP, UNEP, and UNIDO, in collaboration with a range of other partners, including members of the Global Mercury Partnership.

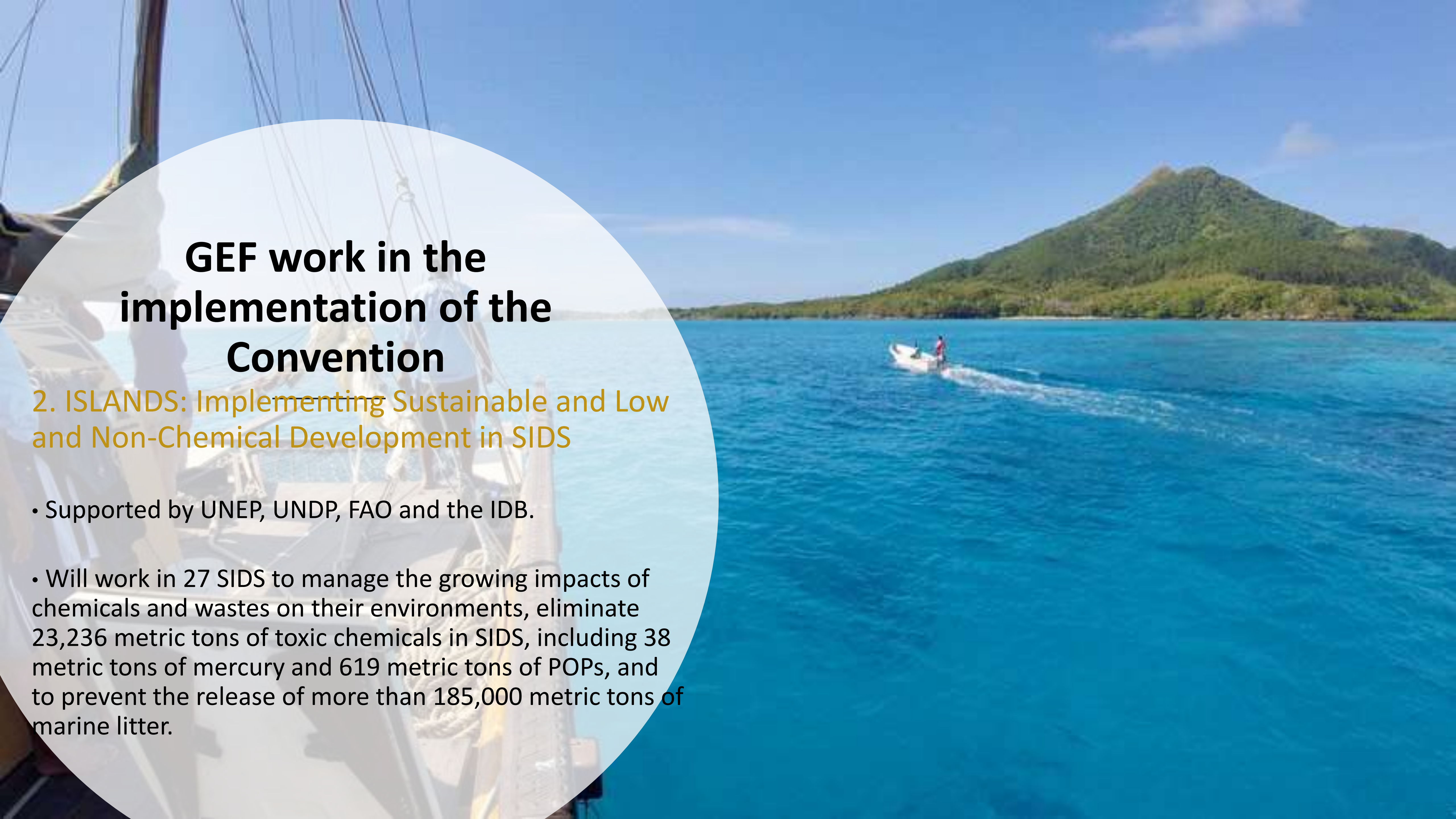
- Support miners in 8 countries (Burkina Faso, Colombia, Guyana, Indonesia, Kenya, Mongolia, Peru and the Philippines) replace toxic Hg with cleaner techniques, as well as improve access to finance and facilitate formalization of the sector.



# GEF work in addressing gaps







## **GEF work in the implementation of the Convention**

### **2. ISLANDS: Implementing Sustainable and Low and Non-Chemical Development in SIDS**

- Supported by UNEP, UNDP, FAO and the IDB.
- Will work in 27 SIDS to manage the growing impacts of chemicals and wastes on their environments, eliminate 23,236 metric tons of toxic chemicals in SIDS, including 38 metric tons of mercury and 619 metric tons of POPs, and to prevent the release of more than 185,000 metric tons of marine litter.



# Strengthening the Science-Policy Interface at the international level for the sound management of chemicals and waste

UNEA Resolution 4/9, March 2019, considering the urgent need for such strengthening to support and promote science-based action at the local, national, regional and global levels, requested UNEP to prepare by April 2020, an assessment of options.

UNEP is to take into account existing mechanisms, including under UNEP, and examples in other areas, in order to:

- Maximise cost-effectiveness,
- Make best use of new technologies,
- Track progress, and
- Improve implementation of MEAs at the national level.





# Key messages

1. Global Mercury Assessments and other scientific publications form the basis of the Minamata Convention.
2. Knowledge on health effects of mercury is critical in addressing mercury pollution nationally and globally. Further knowledge in ecological effects is needed.
3. Minamata Convention addresses the whole life cycle of mercury. Scientific and technical knowledge is essential in managing each step of the mercury life cycle.
4. Effectiveness evaluation relies on the reporting by parties on the policy measures taken, on scientific and technical knowledge about the level of mercury in the environment and on the environmental and health effects.





**WEB**

[www.mercuryconvention.org](http://www.mercuryconvention.org)

**E-MAIL**

[MEA-MinamataSecretariat@un.org](mailto:MEA-MinamataSecretariat@un.org)

**TWITTER**

[@minamataMEA](https://twitter.com/minamataMEA)

[#MakeMercuryHistory](https://twitter.com/hashtag/MakeMercuryHistory)

