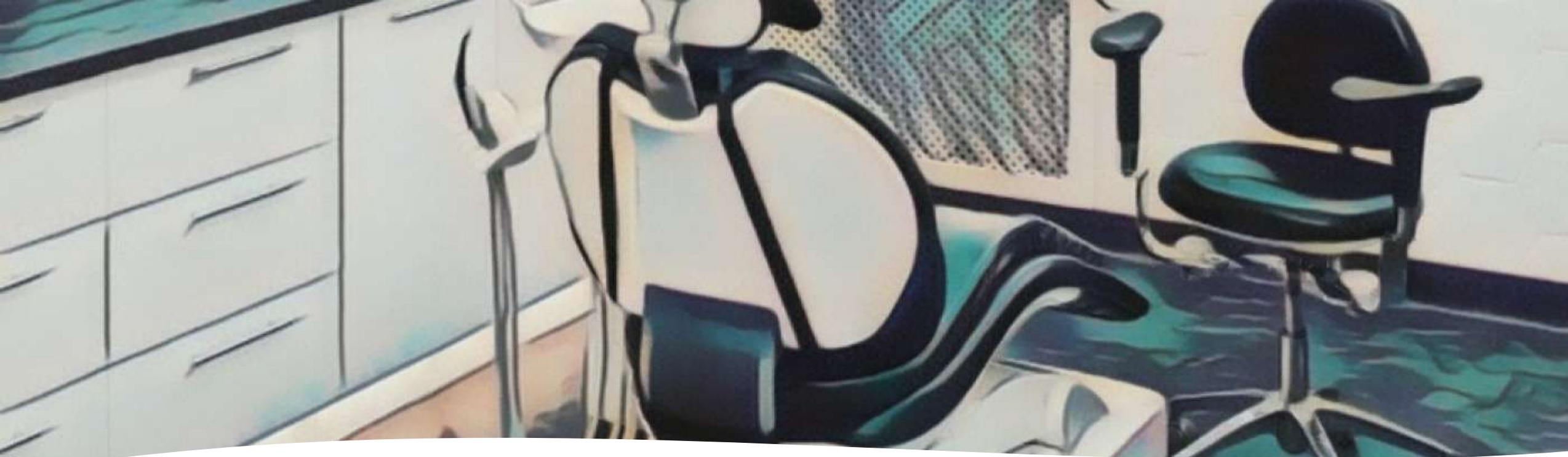




# Phasing down the use of dental amalgam and managing its associated waste: from knowledge to action



Webinar, Monday 18 December 2023



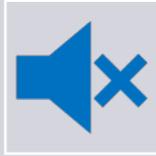
## Opening remarks and scene setting

Kenneth Davis, *Chemicals and Health Branch, UNEP*

# For the smooth running of the webinar, please :



GLOBAL  
MERCURY  
PARTNERSHIP



Keep **microphones off** unless when making an intervention, cameras are optional



Use the “**Chat**” to ask technical questions or share views



The **meeting will be recorded**. Please indicate if you have any objection

# AGENDA

Opening remarks and scene setting (2:30 pm), [Kenneth Davis](#), *Chemicals and Health Branch, UNEP*

Available knowledge and existing actions (2:35 pm), *facilitated by* [Benoit Varenne](#), *World Health Organization*

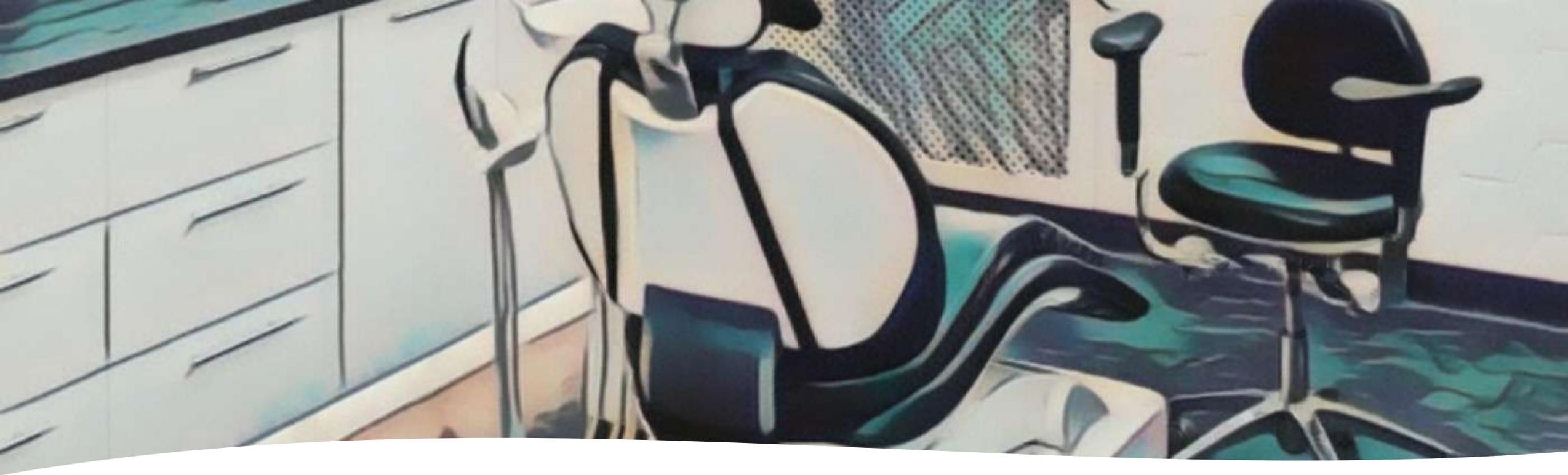
- Dental amalgam and the Minamata Convention: latest updates pursuant to COP5, [Eisaku Toda](#), *Minamata Convention Secretariat*
- Best practices for dental amalgam waste management in health facilities, [Nicolas Martin](#), *Sheffield University*
- International developments in policies and regulatory framework and momentum building towards a global phase out of dental amalgam, [Michael Bender](#), *Zero Mercury Working Group*, [Florian Schulze](#), *European Network for Environmental Medicine*

## Questions and Answers

- Phasing down the use of dental amalgam: project overview and current progress, [Gabriela Sardon](#), *World Health Organization*
- Challenges in the management of dental amalgam waste, [Kumar Rajan](#), *World Health Organization South-East Asia Regional Office*
- Best practices and current approaches for the sound transport, treatment and final disposal of mercury in dental wastes, [David Hunter](#), *BATREC*

## Questions and Answers

Closing remarks (3:55 pm), [Grace Halla](#), *GEF Chemicals and Waste Unit, UNEP*



# Available knowledge and existing actions

*facilitated by [Benoit Varenne](#), World Health Organization*

# Fifth meeting of the Conference of the Parties



## Fifth meeting of the Conference of the Parties to the Minamata Convention on Mercury (COP-5)

Geneva, Switzerland, 30 Oct 2023 - 03 Nov 2023



More than 800 participants and 115 Parties represented

21 decision adopted

- ❖ The effects of mercury pollution on Indigenous Peoples and on local communities
- ❖ Mercury supply sources and trade
- ❖ Study of the global supply, trade and use of mercury compounds
- ❖ Amendments to annexes A and B
- ❖ Preparation of a report on cosmetics listed in part I of annex A to the Minamata Convention on Mercury
- ❖ Information on the Economic and Technical Feasibility of Mercury-Free Catalysts in VCM Production
- ❖ Artisanal and small-scale gold mining
- ❖ Mercury emissions
- ❖ Guidance on BAT/BEP to control releases
- ❖ Mercury waste thresholds
- ❖ Review of the financial mechanism
- ❖ Capacity building, technical assistance and technology transfer
- ❖ National reporting
- ❖ First effectiveness evaluation of the Minamata Convention on Mercury
- ❖ Gender action plan
- ❖ Knowledge management
- ❖ Contribution of the Minamata Convention to the Kunming-Montreal Global Biodiversity Framework
- ❖ Enhanced international cooperation and coordination
- ❖ Cooperation between the secretariat of the Minamata Convention on Mercury and the BRS secretariat
- ❖ Programme of work and budget for 2024-2025
- ❖ Dates and venue of COP-6

# Decision MC-5/4: Amendments to annexes A and B and feasibility of mercury-free alternatives for manufacturing processes listed in annex B



## Annex A Part II

Mercury-added products	Provisions
Dental Amalgam	<p>Measures to be taken by a Party to phase down the use of dental amalgam shall take into account the Party's domestic circumstances and relevant international guidance and shall include two or more of the measures from the following list: (i)..... (ix)...</p> <p>In addition, Parties shall: (i)... (ii)...</p> <p>In addition, Parties that have not yet phased out dental amalgam shall: (i) Submit to the secretariat a national action plan or a report based on available information with respect to progress they have made or are making to phase down or phase out dental amalgam every four years as part of national reporting.</p>

# Decision MC-5/4: Amendments to annexes A and B and feasibility of mercury-free alternatives for manufacturing processes listed in annex B



## *The Conference of the Parties*

6. *Decides* to consider at its sixth meeting the proposal to amend part I of annex A by adding the following entry:

<i>Mercury-added products</i>	<i>Date after which the manufacture, import or export of the product shall not be allowed (phase-out date)</i>
[Dental Amalgam]	[2030]

7. *Decides* to consider at its sixth meeting the proposal to amend part II of annex A by adding the following provision:

Mercury-added products	Provisions
Dental Amalgam	In addition, Parties shall: (iv) [[Exclude or not allow] [Phase down], by taking measures as appropriate, the use of dental amalgam in government insurance policies and programmes.] (Alternative to (iv)) [Take measures, as appropriate, to exclude, not allow, [or phase down] dental amalgam in government policies or programmes]

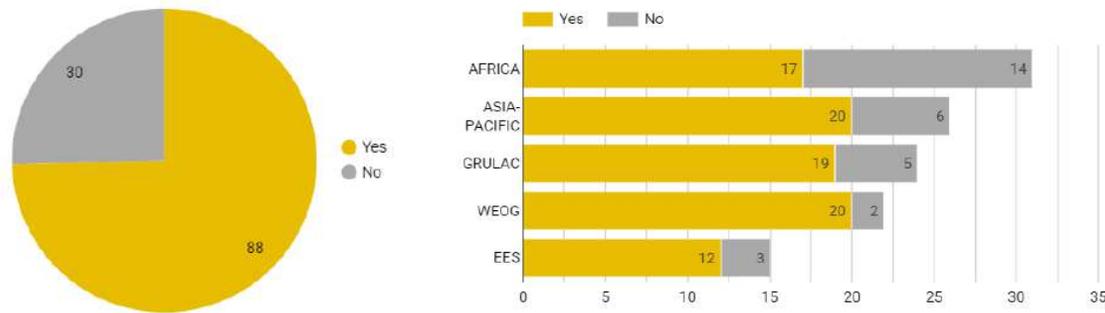
# Monitoring progress

## Article 21 national report

**Question 4.3:** Has the party taken two or more measures for the mercury-added products listed in part II of annex A in accordance with the provisions set out therein? (para. 3)

- Yes
- No

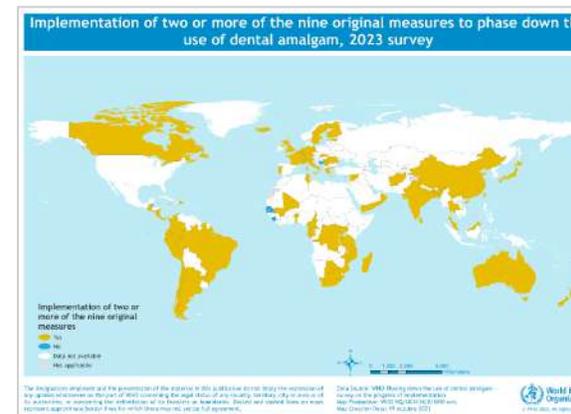
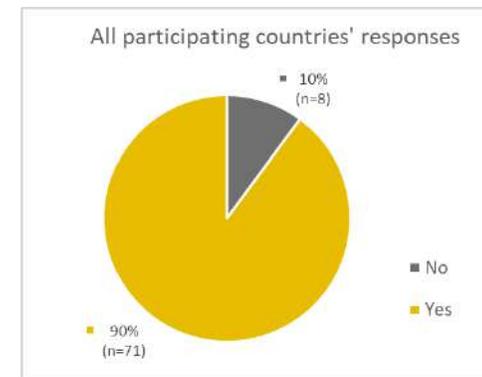
If yes, please provide information on the measures.



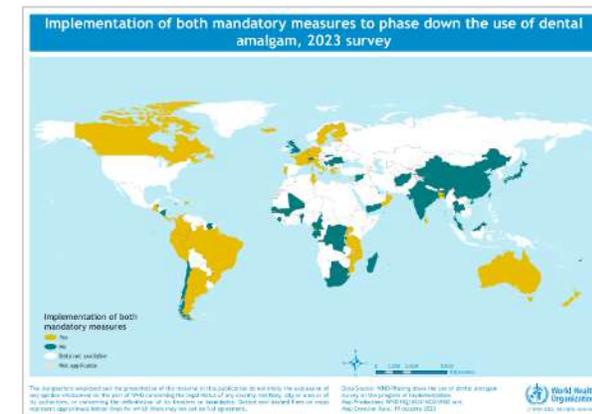
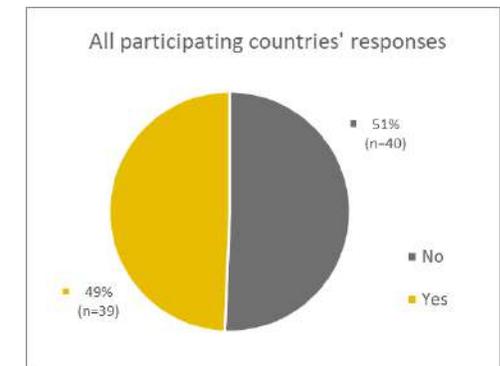
[UNEP/MC/COP.5/INF/23](#): Article 21 synthesis report

## WHO/MC Secretariat joint survey

Implementation of two or more of the nine original measures



Implementation of both mandatory measures



[UNEP/MC/COP.5/INF/30/Rev.1](#): WHO and ILO reports to COP-5



The  
University  
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Sheffield.

School  
Of  
Clinical  
Dentistry.

# Best practices for dental amalgam waste management in health facilities – Awareness & action

**Professor Nicolas Martin**

18th December 2023



## Waste Dental Amalgam

- The need for careful and safe management
- The fate of waste amalgam
- The fate of waste mercury
- Best Practice



## Partnership Objective:

“to minimize and, where feasible, eliminate unintentional mercury releases to air, water, and land from waste containing mercury and mercury compounds by following a Life Cycle Management approach”

- Identify and disseminate information on environmentally sound collection, transportation, **treatment and disposal techniques and practices** for different types of **mercury wastes** to reduce mercury releases from waste by following a Life Cycle Management approach.
- **Assess environmental impacts of current waste management practices and processes**, including providing support to countries to assess their national situation and needs.
- Promote public **awareness of the hazards associated with mercury wastes and their management** and support community engagement in the activities of the Partnership Area.

## Partnership Objective:

“to minimize and, where feasible, eliminate unintentional mercury releases to air, water, and land from waste containing mercury and mercury compounds by following a Life Cycle Management approach”

- **placement and removal** of fillings
- **dental waste** - degradation of amalgam in setting and release of human excretion
- **end of life** following burial and emissions from cremation

- **Air** – Cremation or incineration of medical waste
- **Earth** – Interment, landfill and sewage sludge spreading
- **Water** – Indirect discharges via wastewater treatment



## Waste Dental Amalgam at chairside

- Amalgam particles
- Dissolved elemental mercury
- Inorganic mercury
- Methyl mercury



## Amalgam in wastewater streams

### Accumulation in:

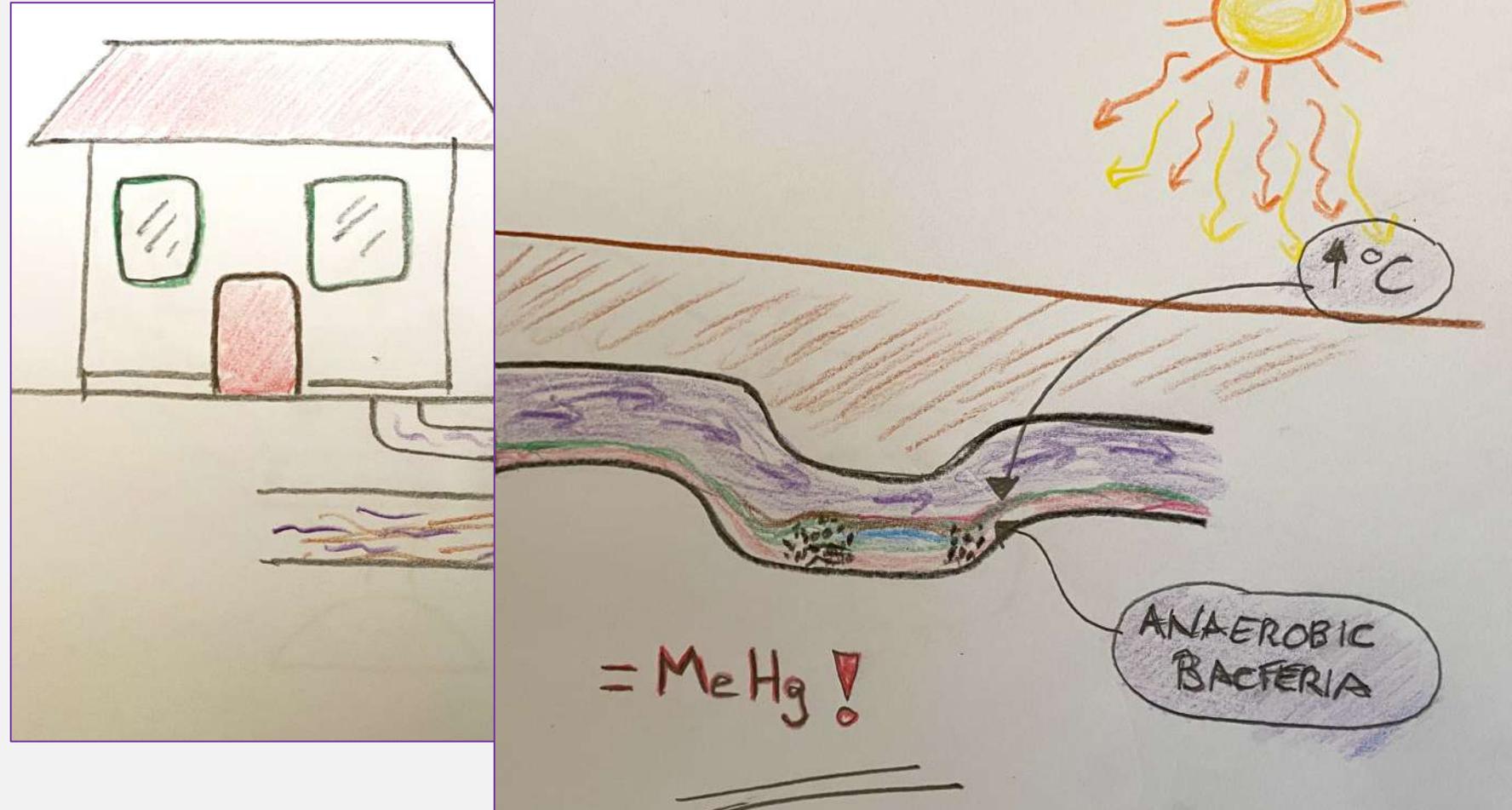
- Wastewater lines
- Tanks and pipework
- Potential for biogenesis of MeHg

(anaerobic bacteria, temperature, pH, Oxygen levels, organic matter, sulphate levels and speciation of Hg)

Dental wastewater lines  
are an ideal environment  
for **methyl mercury**  
genesis

## Amalgam in waste water –

- Sedimentation and accretions
- Anaerobic bacteria
- Higher temperatures



## Amalgam separators –

The most  
effective way to  
mitigate the  
effect of waste  
Hg from  
Amalgam

- A minimum mercury removal efficiency of 95% of particulate mercury (ISO 11143)
- Effective clinical governance:
  - Local waste collection
  - ICP guidelines and protocols
  - Municipal water management legislation

## IPC –

### Infection Prevention Control

- International standards (ISO 11143 and ISO 45006)
- National legislation (e.g. UK: HTM 01-05)
- Engagement with waste disposal services
- Water lines flushed with non-detergent enzymatic vacuum cleaners

The waste ‘sludge’ in the amalgam separator is now ‘safe’ for collection and disposal

Use of appropriate PPE and waste containers



## IPC – National Legislation

e.g. In the UK:  
HTM 01-05

### (HTM 01-05) Decontamination in primary care dental practices

Document first published: 26 March 2013

Page updated: 13 November 2023

Topic: [Estates](#)

Publication type: [Guidance](#)

HTM 01-05 is intended to raise the quality of decontamination work in primary care dental services by covering the decontamination of reusable instruments within dental facilities.

The Infection Prevention Society have produced a [dental audit tool](#) to help practices to self-assess compliance with HTM 01-05.

HTM 01-05 is not available to order in hard copy. It is intended to be read online or for private print purposes only.

Some of these documents are not fully accessible. If you require any of these documents in a different format, please contact: [england.estatesandfacilities@nhs.net](mailto:england.estatesandfacilities@nhs.net)



## Good Waste Management is Key

- Good management
  - Separators
  - Regulated collection system
  - Simple guidelines essential
- **The environmental impact** of dental mercury is mainly **due to the poor management of dental amalgam waste.**
  - The use of **amalgam separating devices reduces** the amount of **amalgam-contaminated water released from dental clinics.**
  - **A regulated collection system for mercury-contaminated solid waste,** especially extracted teeth with amalgam fillings, will prevent mercury vapour release during the combustion of mercury-contaminated solid waste.
  - **The application of simple guidelines for mercury waste** handling will reduce the environmental concerns of dental waste to an insignificant level without compromising dental amalgam's important role in dentistry.



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Of  
Clinical  
Dentistry.

Thank you for your kind attention



**Professor Nicolas Martin**  
n.martin@sheffield.ac.uk

International developments in policies and regulatory framework and momentum building towards a global phase out of dental amalgam

**UNEP Global Mercury Partnership  
Webinar on:**

**Phasing down the use of dental  
amalgam and managing its  
associated waste: from knowledge  
to action**

**18 December 2023**

**Michael Bender**

**Co-Lead, Mercury in Products Partnership Area of  
the Global Mercury Partnership**

Executive Director, Mercury Policy Project

Co-Coordinator of the Zero Mercury Working Group

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

**Florian Schulze**

Managing Director

European Network for Environmental Medicine

<http://environmentalmedicine.eu>



## Who we are:

### **Zero Mercury Working Group:**

- An international coalition of more than 110 public interest, environmental and health non-governmental organizations from over 55 countries from around the world.
- Aim: Reduce/eliminate mercury supply, use, emissions, exposure, implementing the Minamata Convention



### **European Network for Environmental Medicine:**

- We are committed to reduce environmental exposures, promoting research into health links and treatments, better aligning medical care with these findings, and facilitating patient access to analysis.

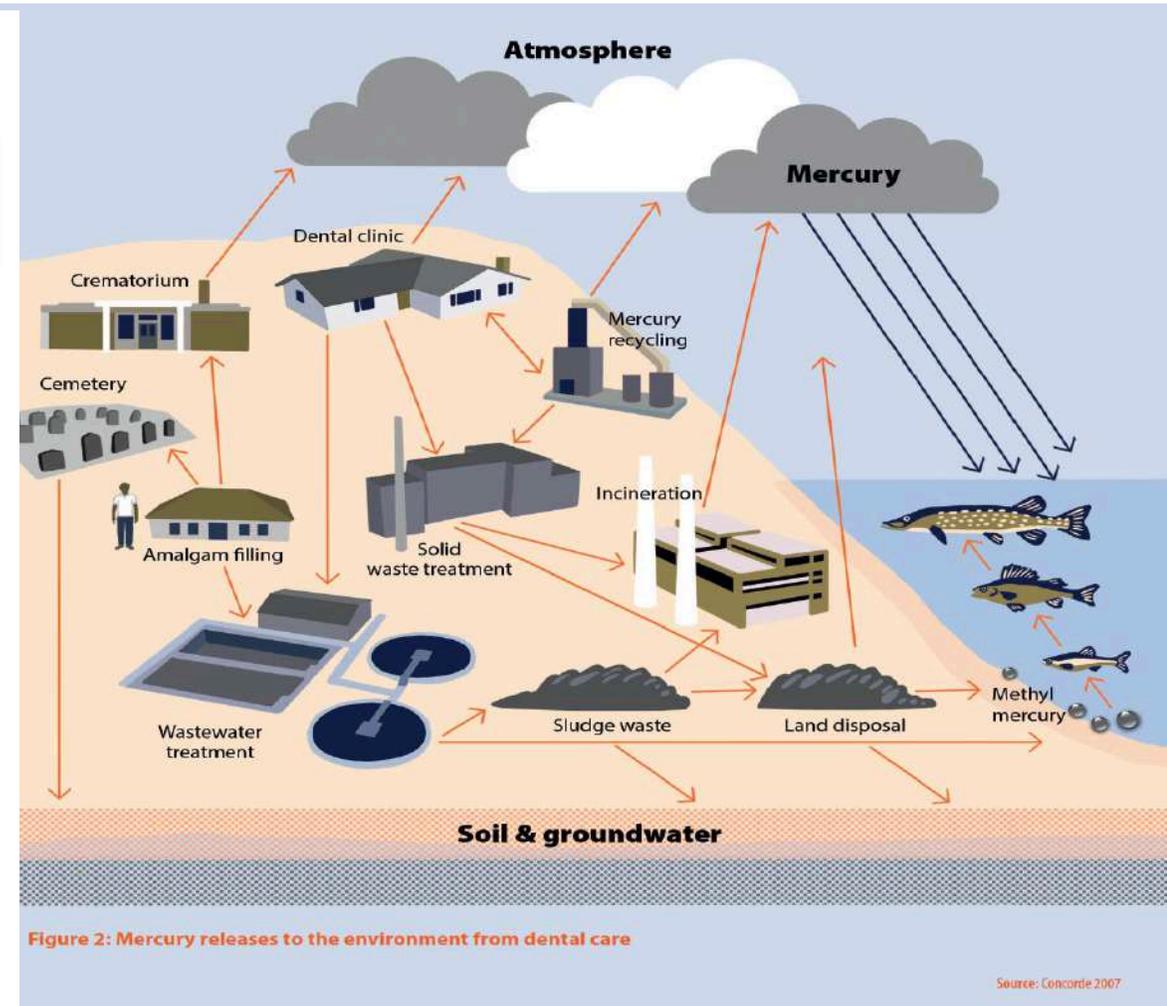


# Challenges of managing amalgam especially without hazardous waste infrastructure in place

**Table 1: Mercury used in dentistry - pathways to the environment**

Global releases/ pathways	Mercury (metric tons/year)
Atmosphere	50-70
Surface water	35-45
Groundwater	20-25
Soil	75-100
Recycling of dental amalgam	40-50
Sequestered, secure disposal	40-50
<b>Total</b>	<b>260-340</b>

Sources: Maxson 2009, as cited in WHO 2011 and AMAP/UNEP 2013



<https://www.unep.org/globalmercurypartnership/resources/report/lessons-countries-phasing-down-dental-amalgam-use>

# Tons of mercury released each year from cremation, crematoria

**Table 4: Country statistics on controlling mercury releases from cremation**

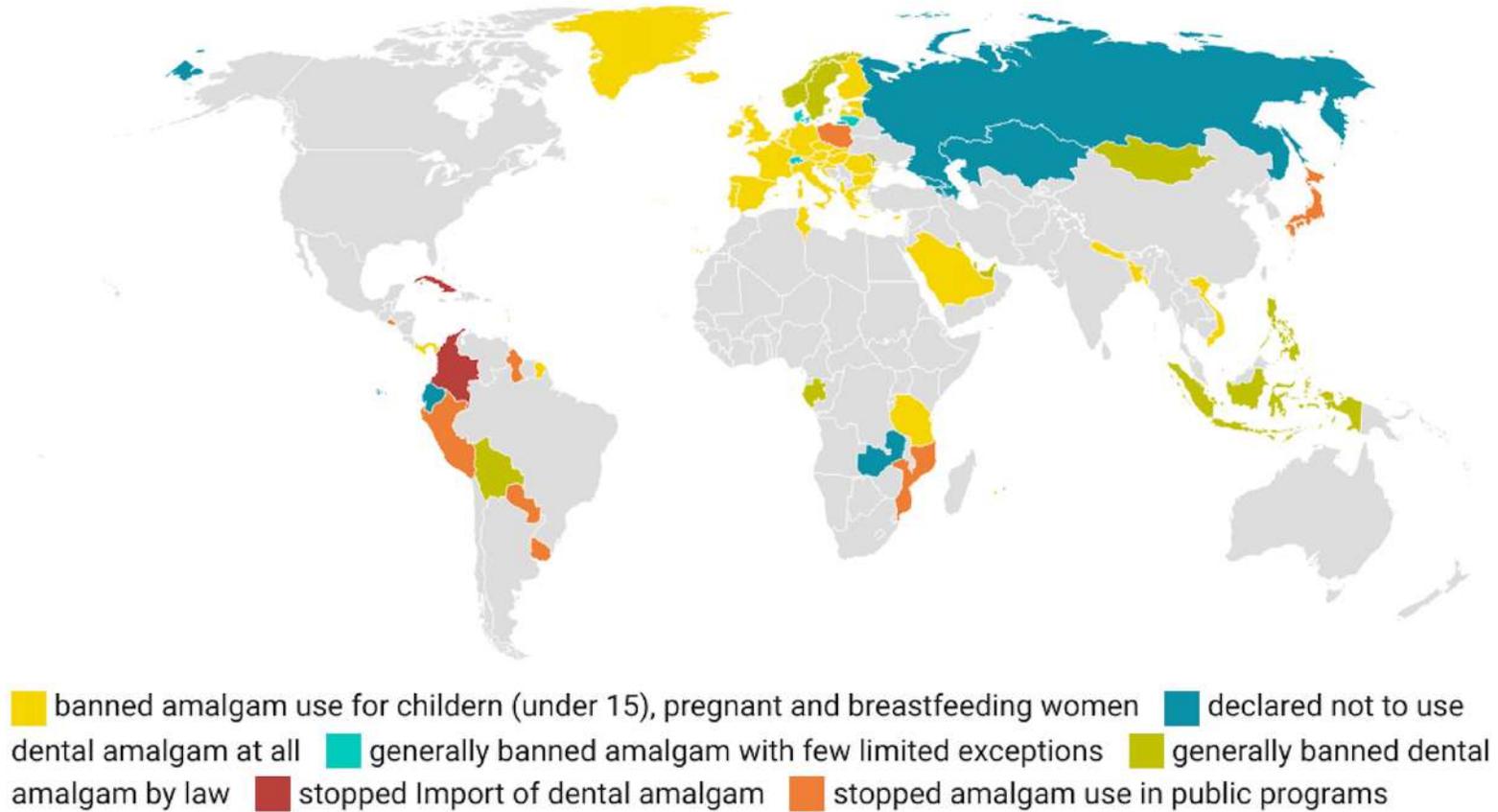
Country	% units with mercury controls	Requirements and/ or date required	Cremations per year	Installation costs per crematorium
Sweden	64% (2009)	95% removal rate required at large units	70,000 (82% at facilities with mercury removal)	Around 100,000 USD, 10% cost for mercury contaminant removal
Switzerland			20,000 (2011)	Ranges from 1,000,000 USD to 1,500,000 USD
Finland		23% of units by 2015-2016		
Norway	62.5% (2012)	Large crematoriums (>200 cremations- /yr.) regulated in 2007	15,544 (2012) 37% at facilities with mercury removal	Investment cost mercury filter (144,000 USD)
Denmark		2011		
Netherlands	>90%	Requirements on large units first: smaller ones required by 2012	75,000 (2008) 55.8% at facilities with mercury removal	Costs for installing devices for 50 crematoria estimated at 32 million USD

**NOTE: As you can see in the last column, crematoria installation costs are quite high and for most countries, they are cost prohibitive**

Sources: Survey questionnaire responses from Sweden, Switzerland, Finland, Norway, Denmark and the Netherlands

<https://www.unep.org/globalmercurypartnership/resources/report/lessons-countries-phasing-down-dental-amalgam-use>

## Global overview of countries phasing out dental amalgam



## Global overview of countries phasing out dental amalgam



Global Dental Amalgam Tracker -  
EnvMed Network  
According to the Minamata Conventions...  
environmentalmedicine.eu

[https://  
environmentalmedicine.eu/  
mercury-free-dentistry-for-  
planet-earth/](https://environmentalmedicine.eu/mercury-free-dentistry-for-planet-earth/)

- 👉 **19** Countries ban Dental Amalgam by law (incl. 4 EU countries, 4 with narrow exceptions, for 4 countries the ban has yet to enter into force)
- 👉 **8** Countries declared not to use Dental Amalgam at all
- 👉 **9** Countries have withdrawn Dental Amalgam from public programs, effectively phasing it out
- 👉 The EU 27 are currently discussing the COM proposal for an overall dental amalgam ban by 1 January 2025, which will affect **23 EU** Countries.
- 👉 **37** Countries have phased out Dental Amalgam for Children up to 15 years, pregnant and breastfeeding Women

## Countries banning dental amalgam use

**Norway:** 2008 with limited exemption period for **3 years**

**Sweden:** 2009 (exemptions ceased in 2018)

**Mongolia:** 2011

**New Caledonia (FR territory):** September 2019 (**immediate\***)

**Moldova:** 2020 (**15 month**)

**Kuwait:** January 2020 (**11 month**)

**Qatar:** July 2021 (**9 days**)

**Bahrain:** Reported without specification (Ban on use of mercury 2002)

**UAE:** Reported without specification (UAE Cosmetics Control System)

**Indonesia:** December 2021 (**14 month**)

**Philippines:** June 2023 (**3 Years**)

**Gabon:** October 2023 (**immediate**)

**Nepal:** August 2024 (**5 Years**)

**Panama:** January 2025 (**4 Years**)

**Tanzania:** December 2029 (**8 Years**)

**Slovakia:** December 2030 (**11 Years**)

**with narrow exemptions**

**Switzerland:** September 2015

**Liechtenstein:** September 2015

**Denmark:** July 2018

**Lithuania:** May 2021

\*time between the adoption and the entering into force of a regulation

## Implementing the COP4 “Children’s Amendment”

By **28 September 2023** parties shall:

Exclude or not allow, by taking measures as appropriate, or recommend against the use of dental amalgam for the dental treatment of deciduous teeth, of patients under 15 years and of pregnant and breastfeeding women, except when considered necessary by the dental practitioner based on the needs of the patient.

**Countries not allowing the use of Dental Amalgam for Children up to 15 years, pregnant and breastfeeding Women:**

<b>Soviet Union:</b>	<b>1982</b> (due to direct health risks)
<b>Sweden:</b>	<b>1995</b>
<b>23 EU:</b>	<b>July 2018</b> ( <b>1 year*</b> + Phase Out Plans)
<b>Bangladesh:</b>	<b>July 2018</b> ( <b>4 month</b> )
<b>Vietnam:</b>	<b>April 2019</b> ( <b>6 days</b> + Phase Out Plan)
<b>Iceland:</b>	<b>July 2019</b> ( <b>3 weeks</b> + Phase Out Plan)
<b>Nepal:</b>	<b>August 2019</b> ( <b>immediate</b> + <b>Phase Out: 21 August 2024</b> )
<b>Philippines:</b>	<b>June 2020</b> ( <b>2 weeks</b> + Import Stop + <b>Phase Out: June 2023</b> )
<b>Saudi Arabia:</b>	<b>2021</b> according to first full Reports
<b>Albania:</b>	<b>July 2021</b> ( <b>2 years</b> + Phase Out Plan)
<b>Tanzania:</b>	<b>September 2021</b> ( <b>20 month</b> + <b>Phase Out: December 2029</b> )
<b>Panama:</b>	<b>January 2021</b> ( <b>immediate</b> + <b>Phase Out: January 2025</b> )

\*time between the adoption and the entering into force of a regulation

## National Action Plans for dental amalgam required by COP5

### Minamata Convention Requirements for Parties that have not yet phased out dental amalgam shall:

Submit to the secretariat a national action plan or a report based on available information with respect to progress they have made or are making to phase down or phase out dental amalgam every four years as part of national reporting.

The next full national reporting is due by **31 December 2025**

### Examples of National Action Plans from the EU (2019)

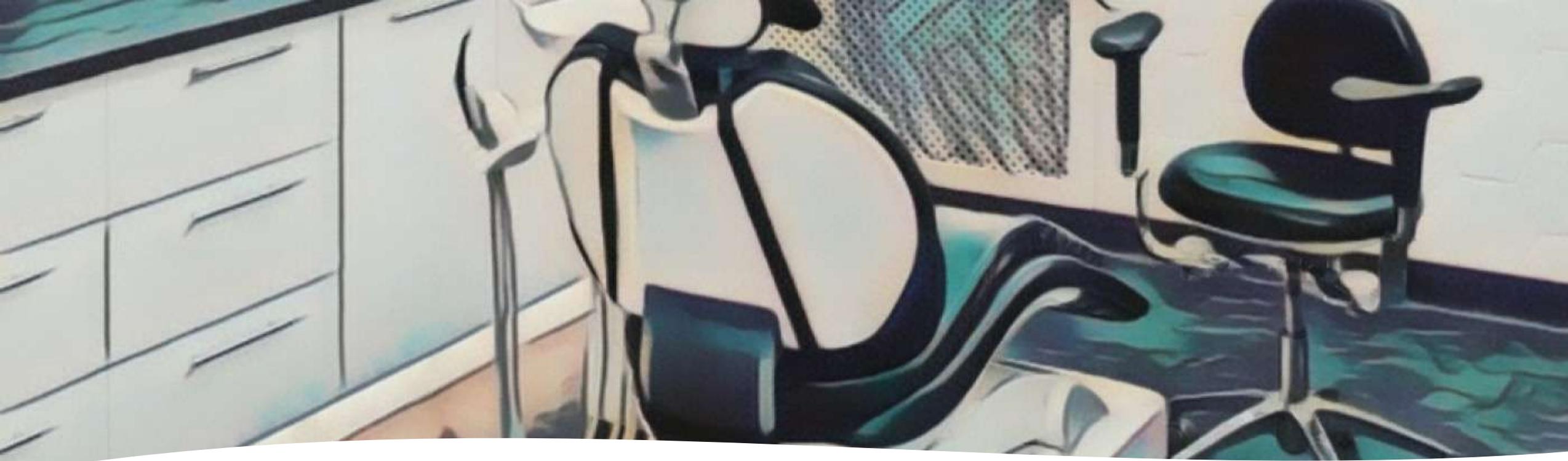
- **12** Member States presented a general phase-out plan
- **7** Member States plan to provide insurance reimbursement for alternative restorations in the same amount as amalgam.
- **Poland** directly replaced dental amalgam in the public health insurance
- **Portugal** and **Romania** planned to require informed consent to use dental amalgam
- **Germany, Latvia** and the **Netherlands** ended the teaching of amalgam placement in its dental schools.

<https://circabc.europa.eu/sd/a/4fd46a0f-54aa-48c6-8483-288ad3c1c281/Dental%20Amalgam%20feasibility%20study%20-%20Final%20Report.pdf>

<https://environmentalmedicine.eu/national-action-plans-to-phase-out-the-use-of-dental-amalgam-in-the-eu-2/>

Thank you!





# Questions and Answers

*facilitated by [Benoit Varenne](#), World Health Organization*



# GEF7 PHASING DOWN DENTAL AMALGAM PROJECT

GEF ID: 10936

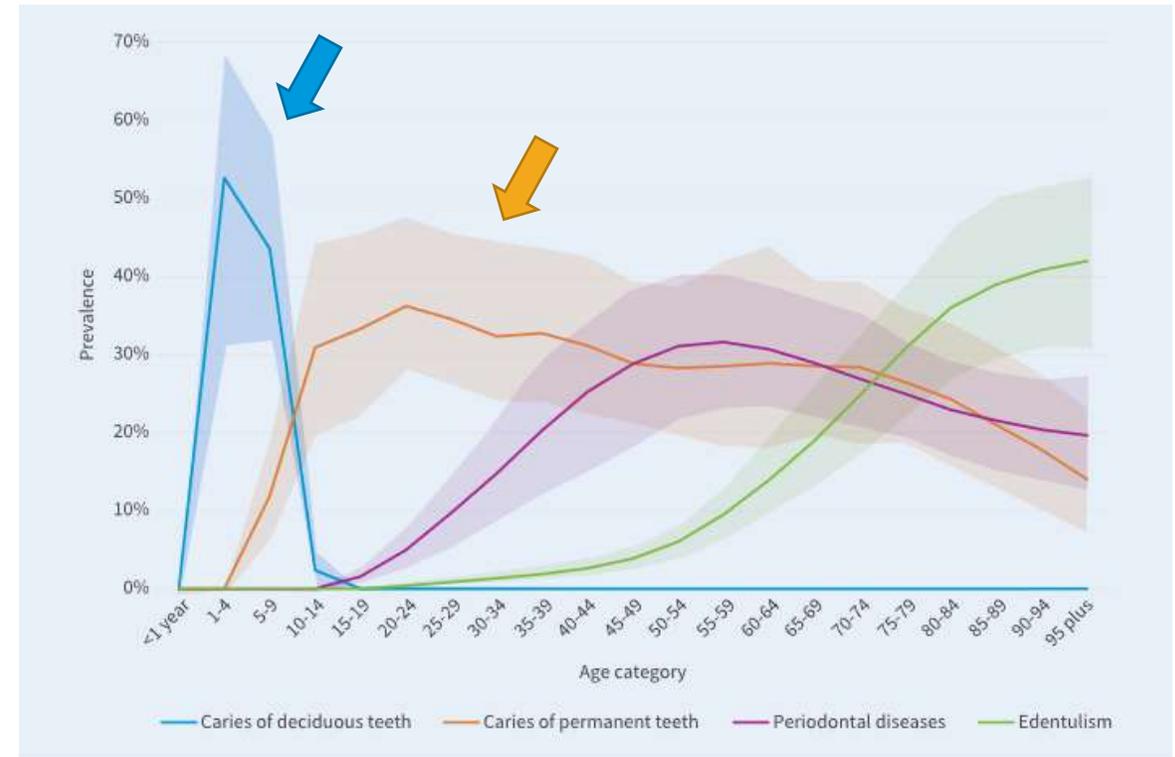
Gabriela Sardon Panta

Oral Health Programme, NCD Department, WHO



# BACKGROUND

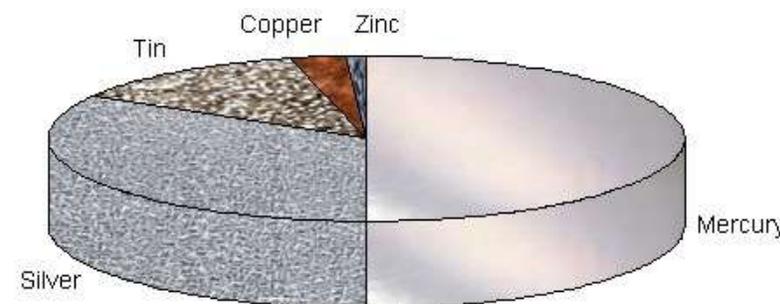
- Dental caries (tooth decay) is the most common non-communicable disease worldwide and a major public health problem, affecting more than 2.5 billion people, including 514 million school-aged children.
- Dental caries across the life-course, affecting **deciduous** and **permanent** teeth
- Dental caries is preventable



Note. Data are from GBD 2019 (4).

# BACKGROUND

- Dental amalgam is
  - a filling material used to treat cavities caused by dental caries for over a 175 years.
  - composed of a mixture of metals, consisting of elemental mercury (~50%) and a powdered alloy composed of silver, tin, and copper, therefore, it is a significant source of mercury pollution.
- Estimates suggest that approximately two thirds of dental amalgam is eventually released to the environment. <sup>1</sup>
- The consumption of mercury in the dental amalgam sector for 2019 was estimated to be in the range of 200 – 500 metric tons. <sup>2</sup>



# MONITORING PROGRESS IN PHASING DOWN DENTAL AMALGAM USE

## Annex A Part II, Dental amalgam provisions:

Measures to be taken by a Party to phase down the use of dental amalgam shall take into account the Party's domestic circumstances and relevant international guidance and shall include two or more of the measures from the following list:

- (i) Setting national objectives aiming at dental caries prevention and health promotion, thereby minimizing the need for dental restoration;
- (ii) Setting national objectives aiming at minimizing its use;
- (iii) Promoting the use of cost-effective and clinically effective mercury-free alternatives for dental restoration;
- (iv) Promoting research and development of quality mercury-free materials for dental restoration;
- (v) Encouraging representative professional organizations and dental schools to educate and train dental professionals and students on the use of mercury-free dental restoration alternatives and on promoting best management practices;
- (vi) Discouraging insurance policies and programmes that favour dental amalgam use over mercury-free dental restoration;
- (vii) Encouraging insurance policies and programmes that favour the use of quality alternatives to dental amalgam for dental restoration;
- (viii) Restricting the use of dental amalgam to its encapsulated form;
- (ix) Promoting the use of best environmental practices in dental facilities to reduce releases of mercury and mercury compounds to water and land.

In addition, Parties shall:

- (i) Exclude or not allow, by taking measures as appropriate, the use of mercury in bulk form by dental practitioners;
- (ii) Exclude or not allow, by taking measures as appropriate, or recommend against the use of dental amalgam for the dental treatment of deciduous teeth, of patients under 15 years and of pregnant and breastfeeding women, except when considered necessary by the dental practitioner based on the needs of the patient.

## Implementation of two or more of the nine original measures and both mandatory measures adopted at COP4 to phase down the use of dental amalgam, September 2023



The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

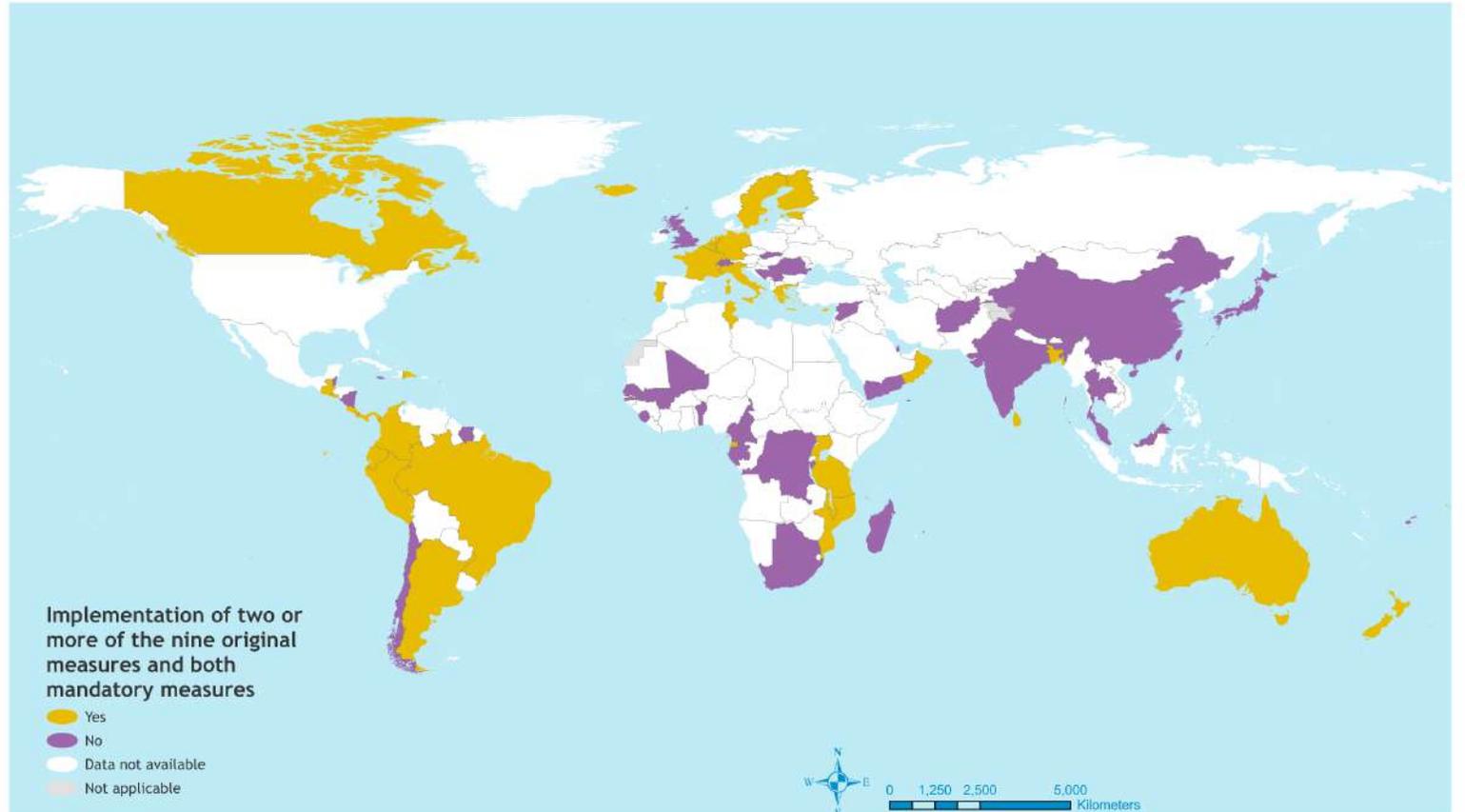
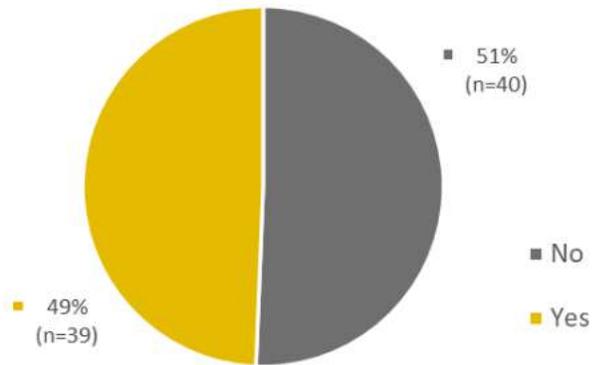
Data Source: WHO Phasing down the use of dental amalgam - survey on the progress of implementation  
Map Production: WHO HQ/UCN/NCD/MND unit  
Map Creation Date: 19 octobre 2023

 **World Health Organization**  
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# MONITORING PROGRESS IN PHASING DOWN DENTAL AMALGAM USE

Implementation of two or more of the nine original measures and both mandatory measures adopted at COP4 to phase down the use of dental amalgam, September 2023

All participating countries' responses



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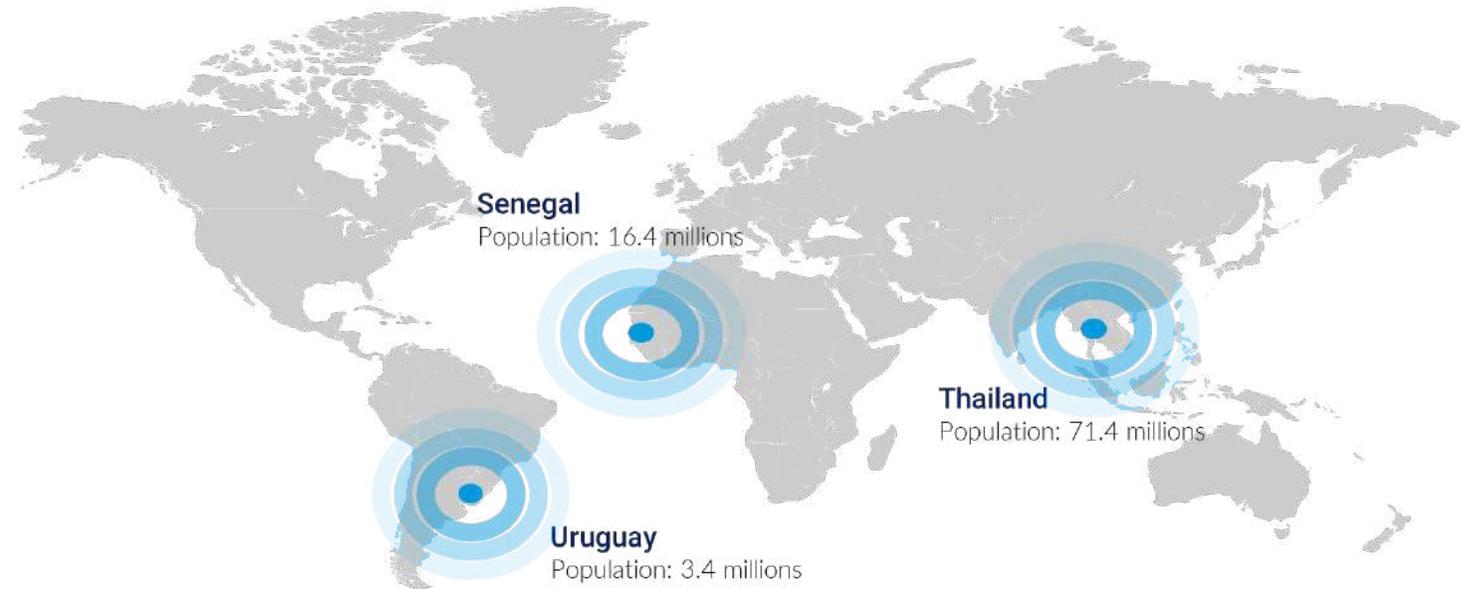
Data Source: WHO Phasing down the use of dental amalgam - survey on the progress of implementation  
 Map Production: WHO HQ/UCN/NCD/MND unit  
 Map Creation Date: 19 octobre 2023



# GEF7 PHASING DOWN DENTAL AMALGAM PROJECT SCOPE: OBJECTIVE AND COMPONENTS

## Project objective

To protect human health and the environment from harmful effects of mercury through implementation of policies and improved practices to phase down the use of dental amalgams



**Timeline:**  
March 2023 – February 2026



Multisectoral collaboration between Ministry of Health and Ministry of Environment in project countries



World Health Organization



HEALTH FOR ALL

# GEF7 PHASING DOWN DENTAL AMALGAM PROJECT SCOPE: OBJECTIVE AND COMPONENTS

## 1 Phase down of dental amalgam use through improved policies and technical capacity



Conduct national situational assessment on regulations, insurance policies, oral health workforce model and curricula – and make improvements in line with the Minamata Convention on Mercury



Establish an inventory of dental amalgam and mercury-free alternatives



Develop case studies that demonstrate the feasibility to phase down the use of dental amalgam

## 2 Improve management of mercury and hazardous waste from dental use



Conduct a national situational assessment on the dental amalgam/mercury waste management schemes and the possibility of a health system-wide approach on mercury management



Select dental/health facilities to demonstrate sound management practices to handle dental amalgam and their wastes



Manage and dispose of dental amalgam waste collected in an environmentally sound manner

## 3 Knowledge management and global awareness



Disseminate project results through the Project Knowledge Hub (UNEP Global Mercury Partnership) and WHO project webpage.



Conduct awareness raising events, present project results at national, regional and international events.



Development of global products:

- 1) Global database to inform project outputs/results, relevant decisions of Conference of the Parties and reporting
- 2) Technical guidance on environmentally friendly and less invasive dentistry.



---

## KEY MESSAGE

- WHO strongly advocates for close collaboration between Ministry of Health and Ministry of Environment to effectively phase down the use of dental amalgam and, in some cases when appropriate, even a phase out.
- This can be achieved by creating a national roadmap with a time-bound agenda including clear roles, deadlines, key stakeholders, and sufficient resources that should be aligned to the WHO Global Oral Health Action Plan (2023-2030)

---

# Thank you very much for your attention

For more information, contact:  
[varenneb@who.int](mailto:varenneb@who.int), [sardong@who.int](mailto:sardong@who.int)



Visit the project knowledge hub:  
[www.unep.org/phasedowntentalamalgam](http://www.unep.org/phasedowntentalamalgam)



World Health  
Organization

75

HEALTH  
FOR ALL

# Challenges in the management of dental amalgam waste: From knowledge to action

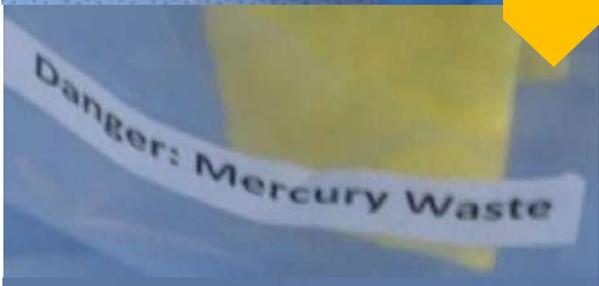
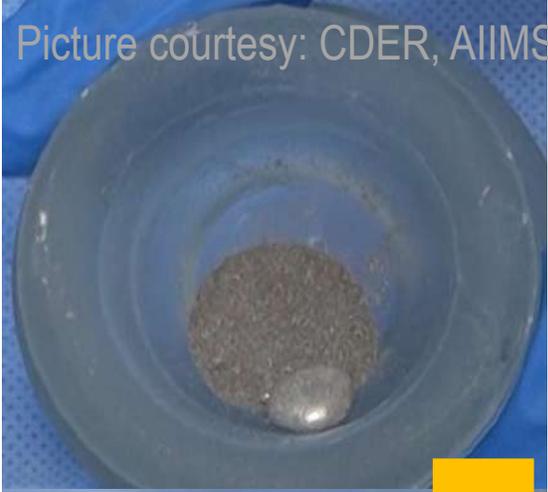
**UNEP** Global Mercury Partnership  
*18 December 2023*

**Kumar Rajan**  
WHO SE Asia Regional Office/ HPN



Picture courtesy: CDER, AIIMS & WHO SEARO

Picture courtesy: CDER, AIIMS & WHO SEARO



**Thankfully, encapsulated form and amalgamators have improved working conditions**

**Collection, safe transportation, processing, treatment & recovery**



# Stakeholders – managing mercury & dental amalgam (DA) waste

- **Educational & research institutions**
  - Course curriculum
  - Studies on impact on health
- **Oral health professionals**
  - Primary user
    - Purchase
    - Storage
    - Handling
    - Disposal
- **Laboratories – developing products**
  - Restorative materials containing mercury
- **Dental traders & suppliers**
  - Import/ export
  - Maintaining stocks for sale
- **Manufacturers of dental amalgam separators**
  - Provide necessary equipment



# Stakeholders – managing mercury & dental amalgam (DA) waste (slide - 2)

- **Regulatory agencies**
  - Governmental bodies
  - Health & safety authorities
  - Compliance monitoring
- **United Nation agencies**
  - Knowledge sharing
  - Developing guidance
- **Environmental organizations**
  - Advocacy
  - Push for stricter regulations
- **Waste management companies**
  - Collection
  - Transportation
  - Processing
- **Local communities**
  - Concerned for DA waste
  - Health & environmental impact
  - Patient safety groups

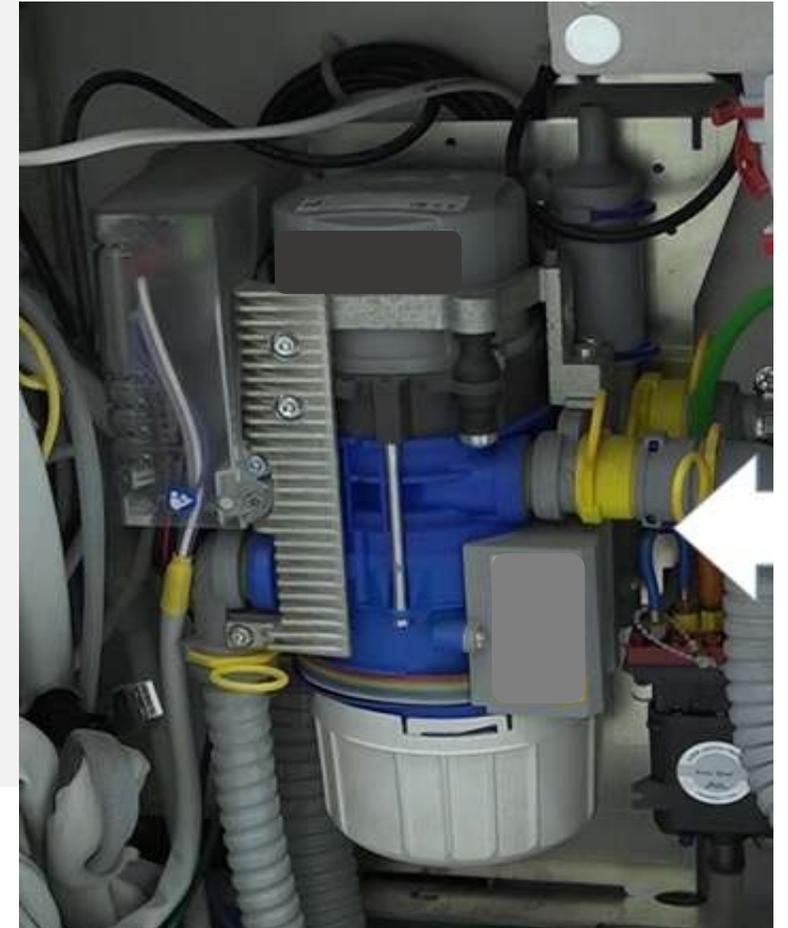
- Patient demand for most affordable treatment
- Coverage under insurance plans
- Lack of information on regulatory compliances
- Lack of national plan on phasing out dental amalgam
- Training of staff
- Limited resources - smaller dental practices (PPE, high volume suction, rubber dam application etc.)
- Record keeping
- Regular monitoring & auditing
- DA waste collection systems
- Appropriate disposal

# Challenges



## Dental amalgam separators

- Availability
- Purchase cost
- Installation
  - Feasibility
  - Renovation
- Maintenance
- Replacement



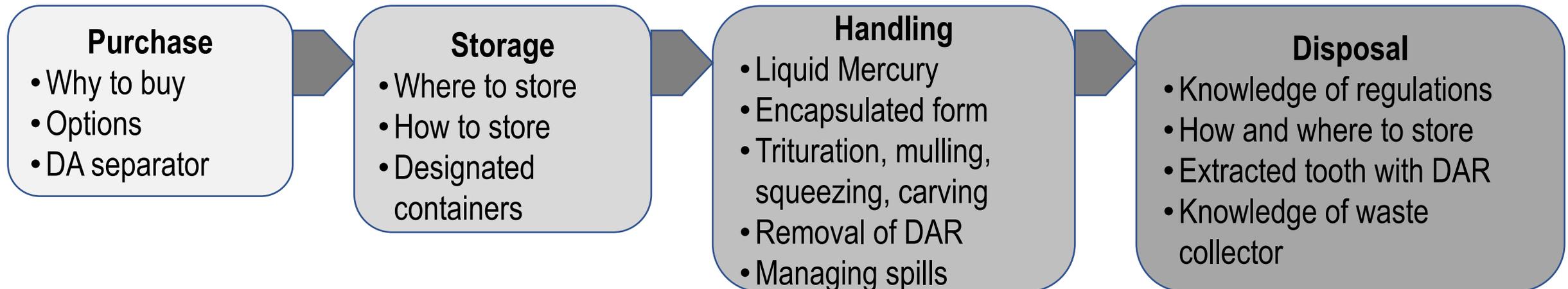
# Awareness & educating oral health professionals on Mercury

**Dental school/college students**  
(dentist, specialist, hygienist, laboratory technician, dental nurse, dental therapist, dental assistant)

Institutions,  
National  
Dental  
Associations  
& Specialty  
Associations

## **Dental practitioners**

1. Older professionals – usage
2. Newer professionals – removal of dental amalgam



## Online link

Hazardous Waste Management  
Series: HAZWAMS/39/2011-2012

### Environmentally Sound Management of Mercury Waste Generated From the Health Care Facilities



#### CENTRAL POLLUTION CONTROL BOARD

(Ministry of Environment & Forests)

Parivesh Bhawan, East Arjun Nagar

DELHI - 110 032

Website: [www.cpcb.nic.in](http://www.cpcb.nic.in)

January 31, 2012



## Press Information Bureau

Government of India



Advance Search 2003  
Onwards



English Release February 2018

Ministry of Environment, Forest and C



Februarj



201:



#### Management of e-Waste

Centre Sanctions New Project to  
Control Pollution of River Sal at  
Navelin, Goa

Celebration of World Wetlands Day at  
Deepor Beel in Assam

Workshop on Technological Innovation  
for Mitigation of Pollution as Part of  
clean air Campaign

Drying up of Rivers

Cabinet approves Ratification of the  
Minamata Convention on Mercury

'It is our duty to Give Back Clean and  
Green Environment to Next  
Generation': Dr Harsh Vardhan

Ministry of Environment, Forest and Climate Change.

07-February, 2018 20:49 IST

### Cabinet approves Ratification of the Minamata Convention on Mercury

The Union Cabinet chaired by the Prime Minister Shri Narendra Modi has approved the proposal for ratification of Minamata Convention on Mercury and depositing the instrument of ratification enabling India to become a Party of the Convention.

The approval entails Ratification of the Minamata Convention on Mercury along with flexibility for continued use of mercury-based products and processes involving mercury compound up to 2025.

The Minamata Convention on Mercury will be implemented in the context of sustainable development with the objective to protect human health and environment from the anthropogenic emissions and releases of mercury and mercury compounds.

The Convention protects the most vulnerable from the harmful effects of mercury and also protects the developmental space of developing countries. Therefore, the interest of the poor and vulnerable groups will be protected.

The Minamata Convention on Mercury will further urge enterprises to move to mercury-free alternatives in products and non-mercury technologies in manufacturing processes. This will drive research & development, and promote innovation.

\*\*\*

AKT/VBA/SH

(Release ID :176356)

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**Central Pollution Control Board**  
Ministry of Environment, Forest and Climate Change  
Government of India

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  - Quality Assurance/Quality Control
  - Waste Management
    - Hazardous Waste
      - Rules
      - Technical guidelines
      - Inventory
      - Orders of Hon'ble NGT & Action taken
    - E-Waste
    - Municipal solid waste
    - Bio Medical Waste
    - Plastic Waste
    - Batteries
    - Construction waste
    - Waste Management Technology
  - Contaminated Sites
  - Industrial Pollution
  - Noise Pollution
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**Messages**

**Chairman**  
Sh. Tanmay Kumar, IAS

**Member Secretary**  
Sh. Bharat Kumar Sharma

**Important Announcements**  
36th AOC Despatched

SKIP TO MAIN CONTENT | SCREEN READER ACCESS | LANGUAGE

**DPCC** **Delhi Pollution Control Committee**  
Government of NCT of Delhi

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**MERCURY WASTE**  
HOME / WASTE MANAGEMENT / MERCURY WASTE

WASTE MANAGEMENT

Bio Medical Waste

**Mercury Waste**

Mercury Waste Management in the Health Care Establishments in Delhi

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Ministry of Environment, Forest and Climate Change  
Government of India

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Hazardous Waste

Common HW T

Air Quality Management



Water Quality Management



Quality Assurance/Quality Control



Waste Management



Contaminated Sites



## Common HW TSDFs

Information on Common Hazardous Waste TSDFs

- ▶ Protocol for reporting quarterly performance
- ▶ Availability of Common TSDFs
- ▶ Status of Escrow Account

### **Availability of Common Integrated Treatment, Storage & Disposal Facilities (TSDFs) with Common Incinerators & Secured Landfills**

S.No.	States/UTs	Integrated TSDFs (with both SLF & Incinerator)	TSDFs with only Common Secured Landfills	TSDFs with Only Common Incinerator
1.	Andhra Pradesh	1	1	0
2.	DD&DNH	1	0	0
3.	Delhi	1	0	0
4.	Goa	1	0	0
5.	Gujarat	2	7	2
6.	Haryana	0	1	0
7.	Himachal Pradesh	0	1	0
8.	Jharkhand	1	0	0
9.	Karnataka	1	2	7
10.	Kerala	0	1	0
11.	Madhya Pradesh	1	0	0
12.	Maharashtra	3	1	0
13.	Odisha	0	1	0
14.	Punjab	1	0	0
15.	Rajasthan	0	2	1
16.	Tamil Nadu	1	1	0
17.	Telangana	1	0	0
18.	Uttar Pradesh	2	1	1
19.	Uttarakhand	1	0	0
20.	West Bengal	2	0	0
<b>Total</b>		<b>20</b>	<b>19</b>	<b>11</b>

FTS 3150818  
F.No.T-20018/38/2018-NCD  
Ministry of Health & Family Welfare  
Directorate General of Health Services  
National Oral Health Programme (NOHP)

Nirman Bhawan, New Delhi  
Dated, 7<sup>th</sup> August 2018

### Meeting Notice

**Subject: Invitation for Workshop on Phasing Down the Use of Dental Amalgam in India on 23<sup>rd</sup> August 2018**

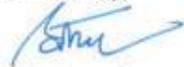
Dear Sir/ Madam,

The Directorate General of Health Services and the Ministry of Health & Family Welfare under the National Oral Health Programme is conducting a workshop on phasing down the use of dental amalgam in India. The meeting is scheduled to be held on **23<sup>rd</sup> August 2018 in Room 445, A Wing, Nirman Bhawan, New Delhi.**

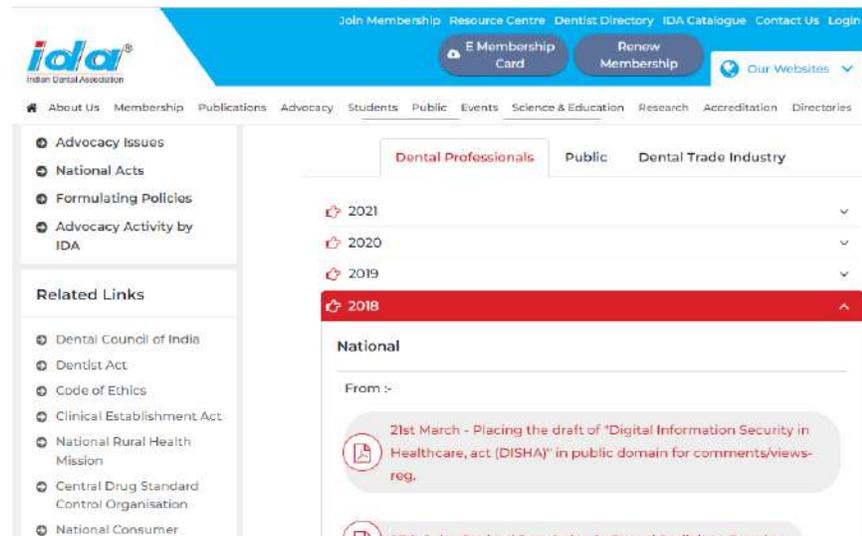
You are requested to kindly participate in the workshop. A tentative programme is as attached in Annexure A. Travel support and dearness allowance (to meet the stay arrangements and other expenditure) for outstation participants has been made available as per Government regulations. Please find attached maximum allowable TA/DA as per grade pay. Please also note that air travel must be done via Air India only (booked through the Air India website or through authorized travel agencies – M/s Balmer Lawrie and Company, M/s Ashok Travels and Tour or IRCTC). TA/DA for Delhi based participants are to be borne from source of salary.

For any queries, please reach out to Dr. Akriti Mehta, National Consultant – NOHP at [nohpindia@gmail.com](mailto:nohpindia@gmail.com) or at 011-23063537.

Yours sincerely,



(Dr. L. Swasticharan)  
Chief Medical Officer



## Mercury Hygiene Practices in Dentistry



**Protocol for Safe Removal of a  
Dental Amalgam Restoration**



**Protocol for Management of Mercury  
Spill in Dental Operator**

# safer working conditions & environme nt

## Report of the informal global WHO consultation with policymakers in dental public health, 2021

*Monitoring country progress in phasing  
down the use of dental amalgam*



*Thank you*

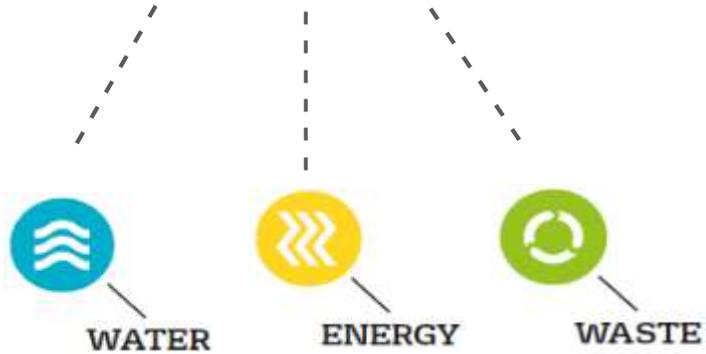
**Setting a  
timeline** for  
achieving the  
Minamata  
Convention on  
Mercury  
measures to  
phase down  
the use of  
dental  
amalgam

# Global Mercury Partnership Phasing down dental amalgam

Treatment of Mercury wastes  
including Dental Amalgam  
& Stabilisation of Mercury

Batrec Industrie AG  
18th Dec 2023  
David Hunter

# Batrec is part of the VEOLIA group



European leader for the treatment and recovery of hazardous industrial waste



Specialists in treatment of Batteries, Activated Carbon and Mercury Wastes



220,000  
No. of  
Employees



6  
Geographical  
zones



28,500  
Million €  
revenue



48  
Million tons of  
waste treated



1991 year of Foundation



19.47 M €  
2022 Turnover



90 employees

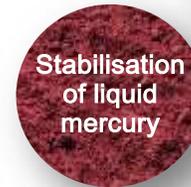
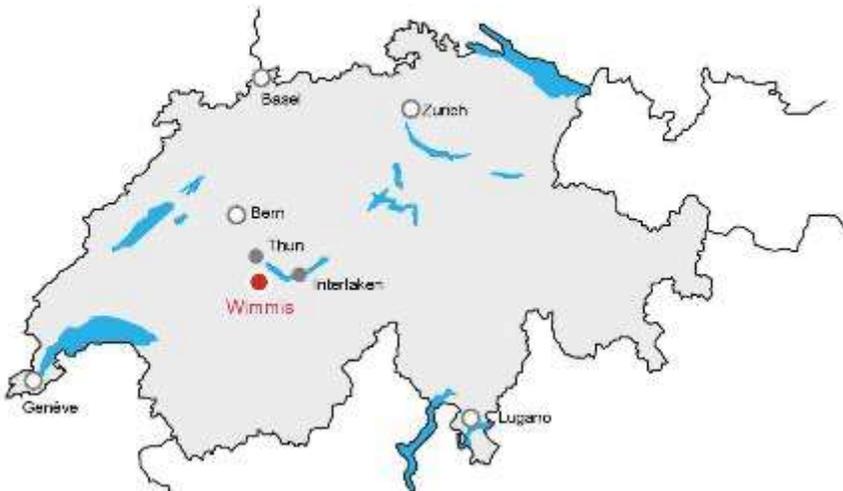


ISO 9001, ISO 14001 & OSHAS 18001  
Certifications



## BATREC

Swiss quality recycling solutions



## BATREC's capability

Treating all kinds of mercury wastes from all over the world





# GEF-7 Project – Phasing Down Dental Amalgam Project



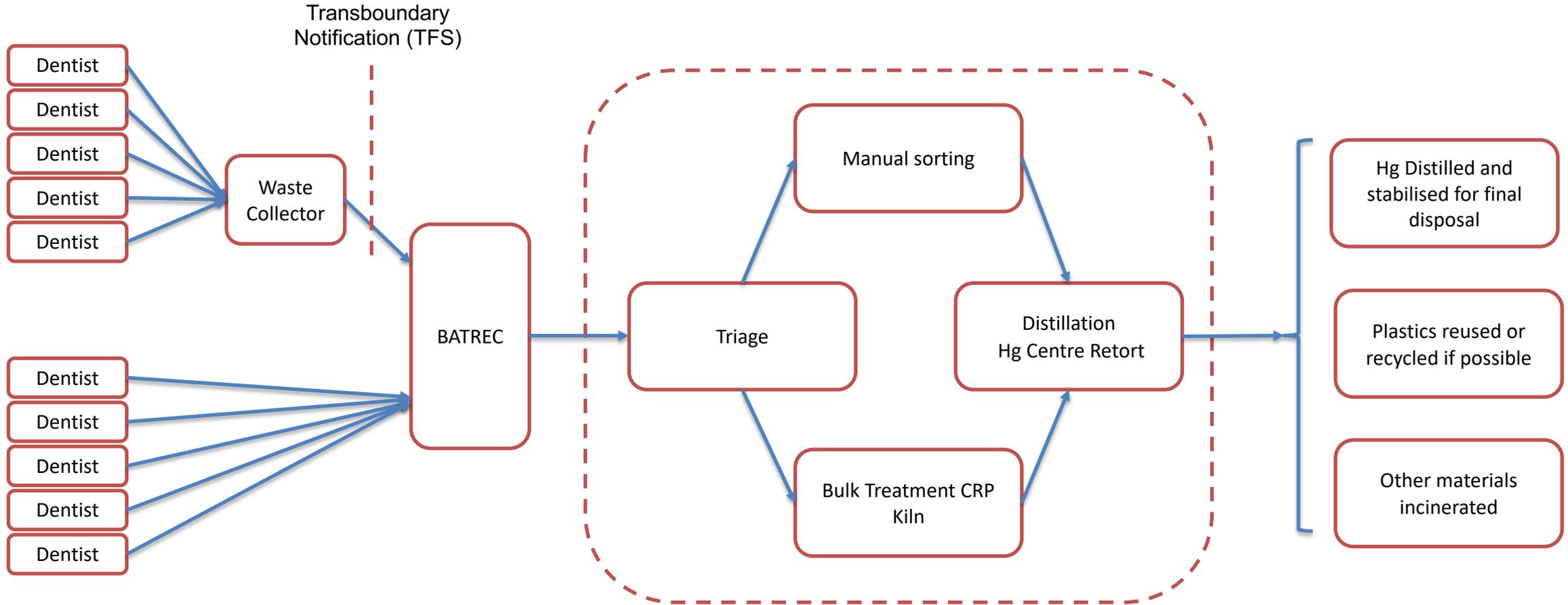
# Dental Amalgam – Mercury Waste Examples



# Dental Amalgam – Mercury Waste Examples



# Dental Amalgam Treatment – Process



# Dental Amalgam Treatment – International Transport

International Transportation of Mercury Waste - **Batrec has experience to support our Partners**

## Packing and labelling

- UN Approved Packaging
- Correct Labelling – ADR/IMDG/IATA/National regulations
- Batrec can provide guidance

## Transboundary Notification Application

- Basel Convention Rules
- 2-6 months
- Batrec has team to support with this process

## Road Shipping

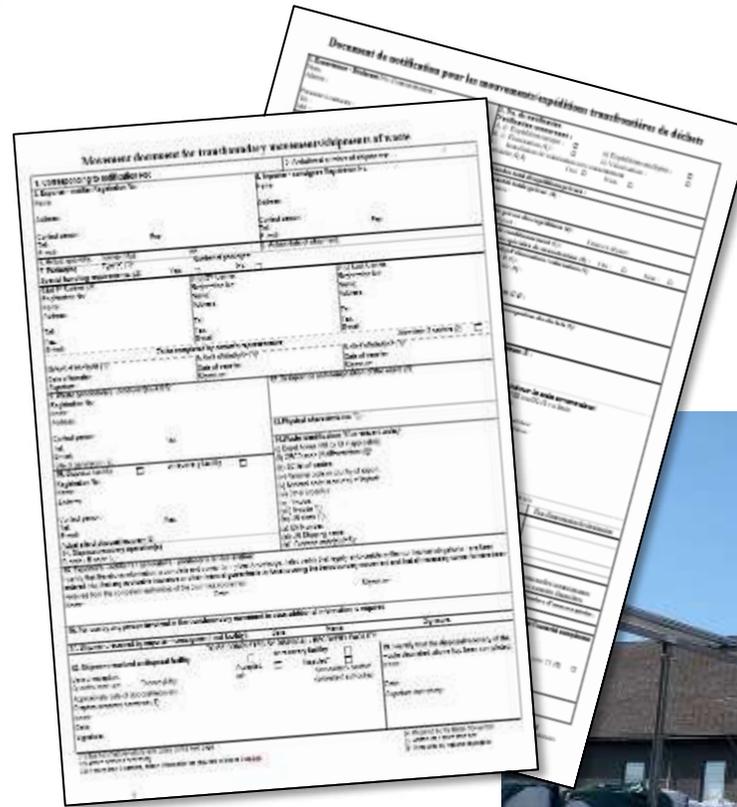
- Must Follow ADR Regulations
- 40 ft Truck Load
- Local Overland Transport

## Maritime and Road Shipping

- Must Follow ADR and IMDG Regulations
- 20 ft ISO Shipping Container
- Large volume – cheap transport if volume is used

## Air and Road Shipping

- Must Follow ADR and IATA Regulations
- Palletised loads
- Small volume – expensive transport



# Treatment Process

## Decontamination Kiln



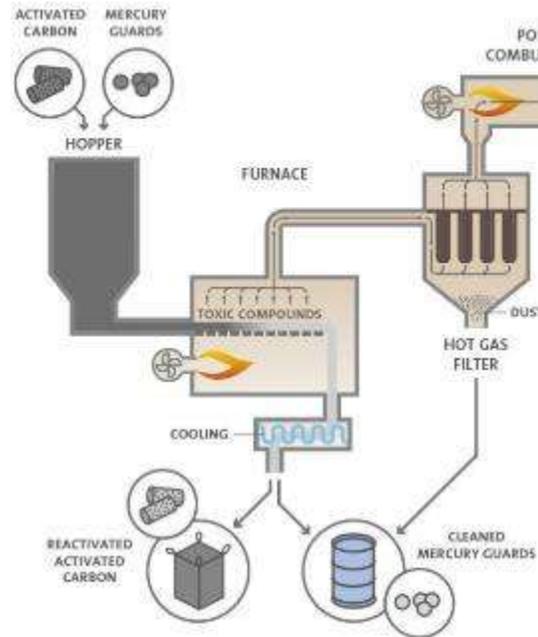
# Treatment Process

## Flowsheet

**1**

### THERMAL TREATMENT

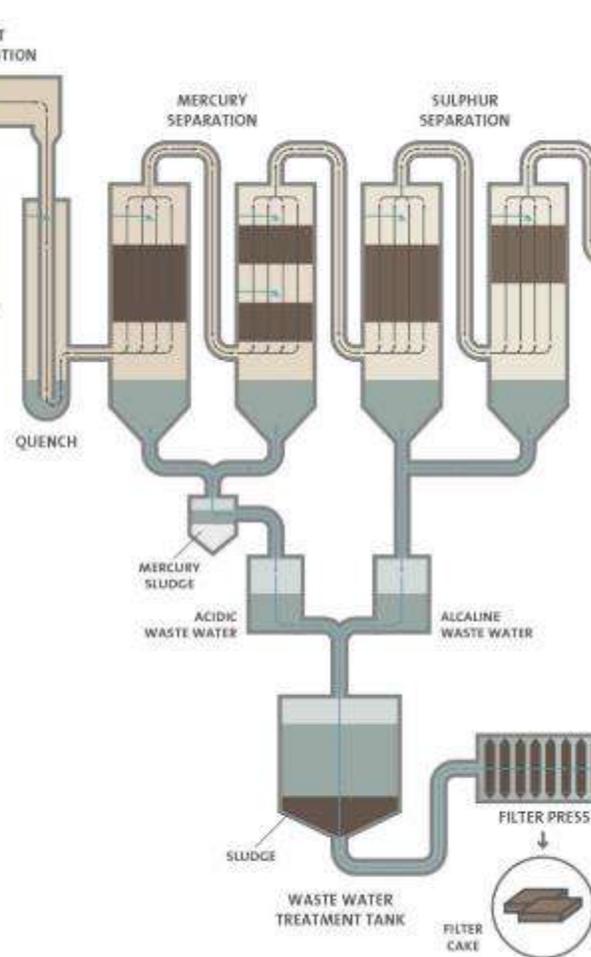
- desorption of the pollutants at 750 – 850°C
- destruction of the organic pollutants in the post-combustion chamber



**2**

### WASTE GAS WET CLEANING

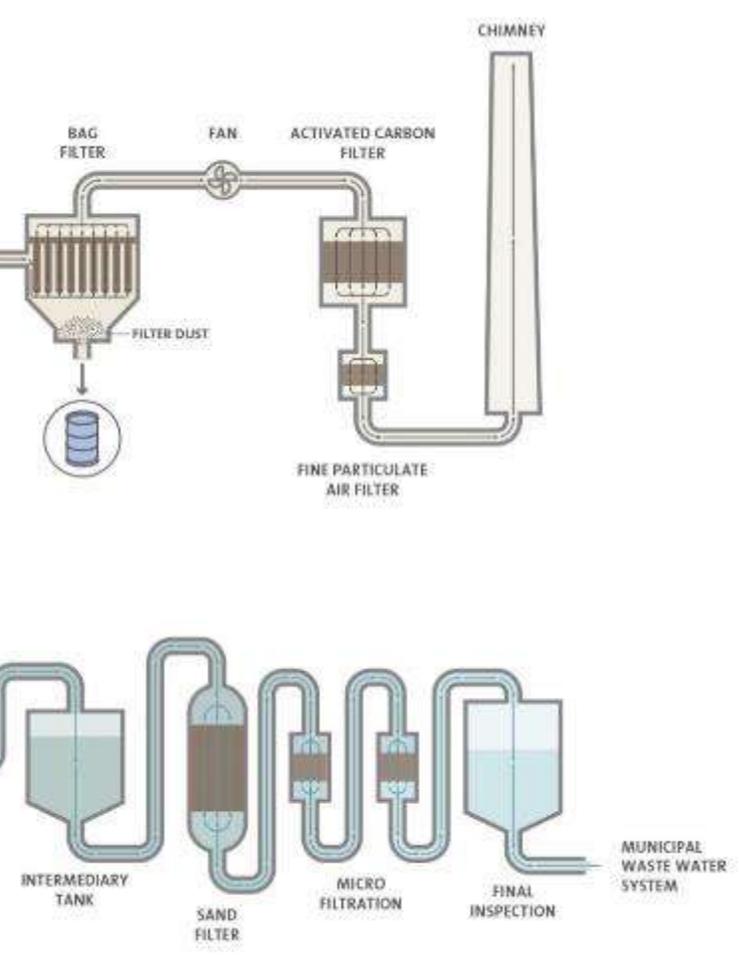
- condensation of Mercury
- removal of Sulfur



**3**

### WASTE GAS DRY CLEANING

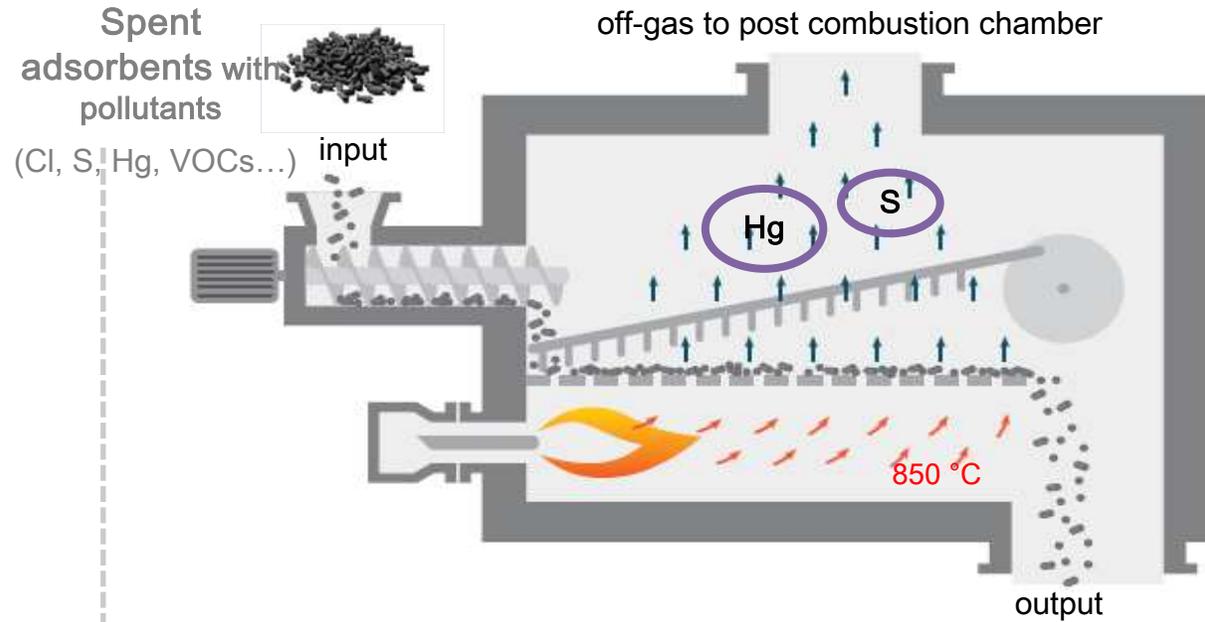
- removal of trace level Mercury
- removal of other pollutants and fine dust
- removal HEPA Filter



### WASTE WATER TREATMENT

# Treatment Process

## Decontamination Furnace



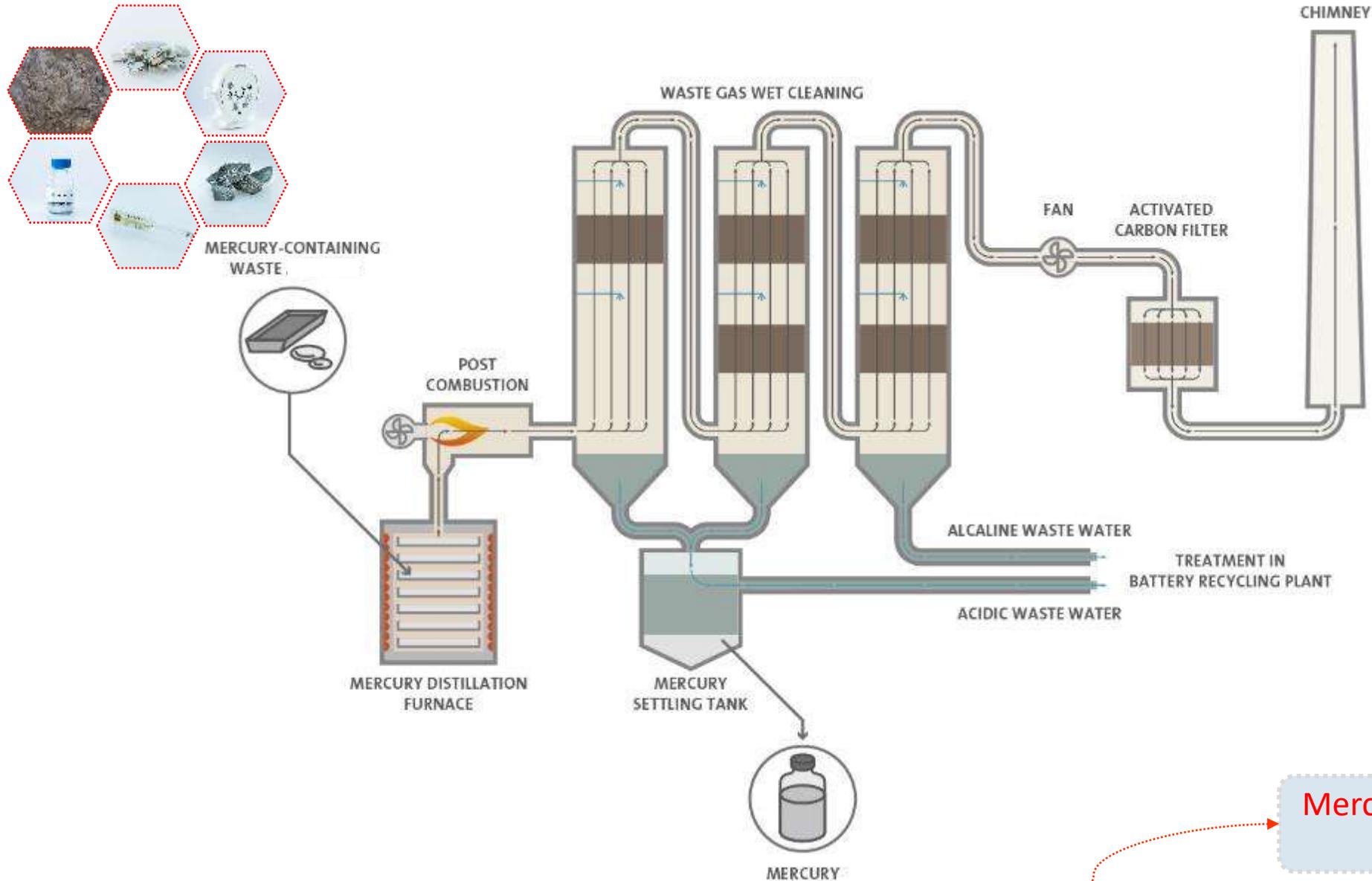
- Mercury (Hg) without limit
- Chlorine (Cl) up to 25%

- Sulphur (S) up to 20%
- VOCs
- Hydrocarbons up to 15%

# Mercury Operations



# Mercury Distillation – Process

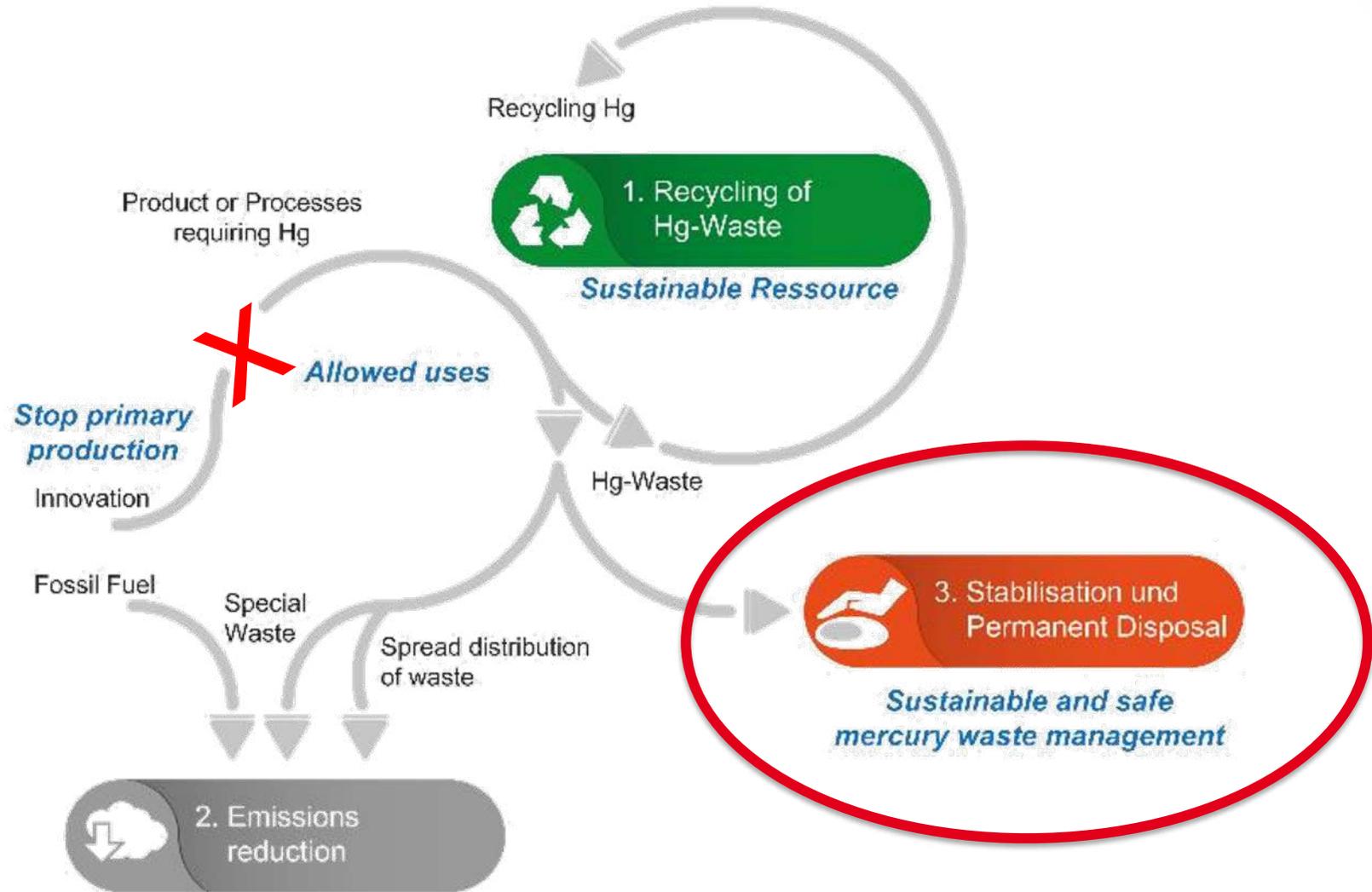


# Distilled mercury – ready for stabilisation



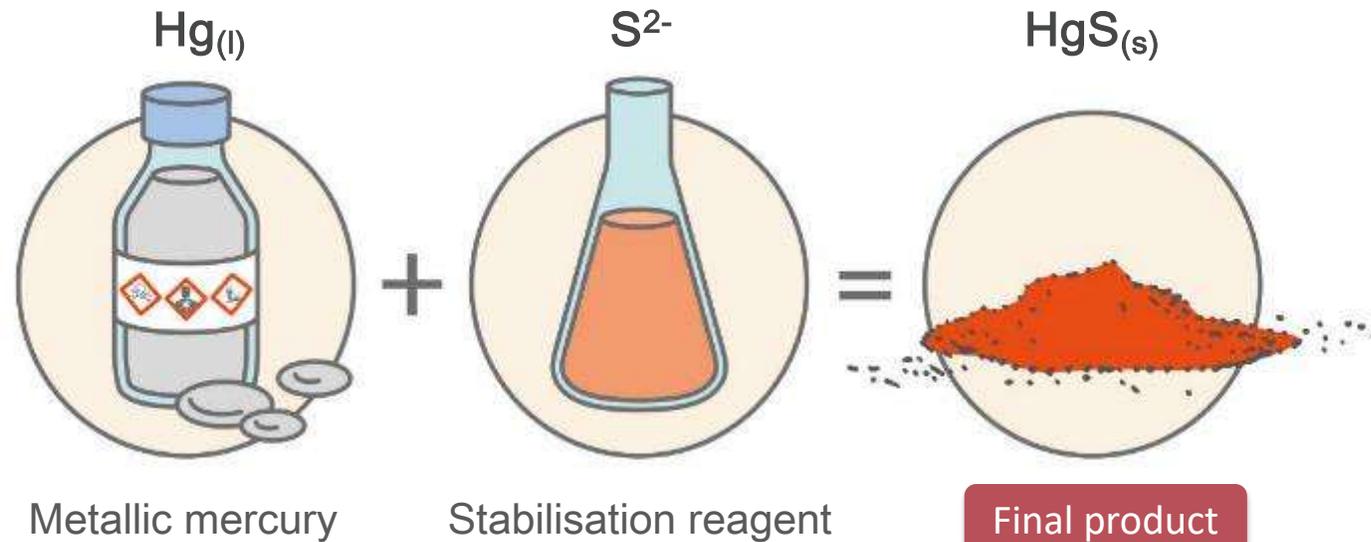
# Why Stabilise Mercury? - The Minamata Convention

2018  
Multilateral environmental agreement that addresses specific human activities which are contributing to widespread mercury pollution.



## Convert Hg into HgS

Controlled reaction at ambient temperature and pressure → low risk, high conversion and consistent product

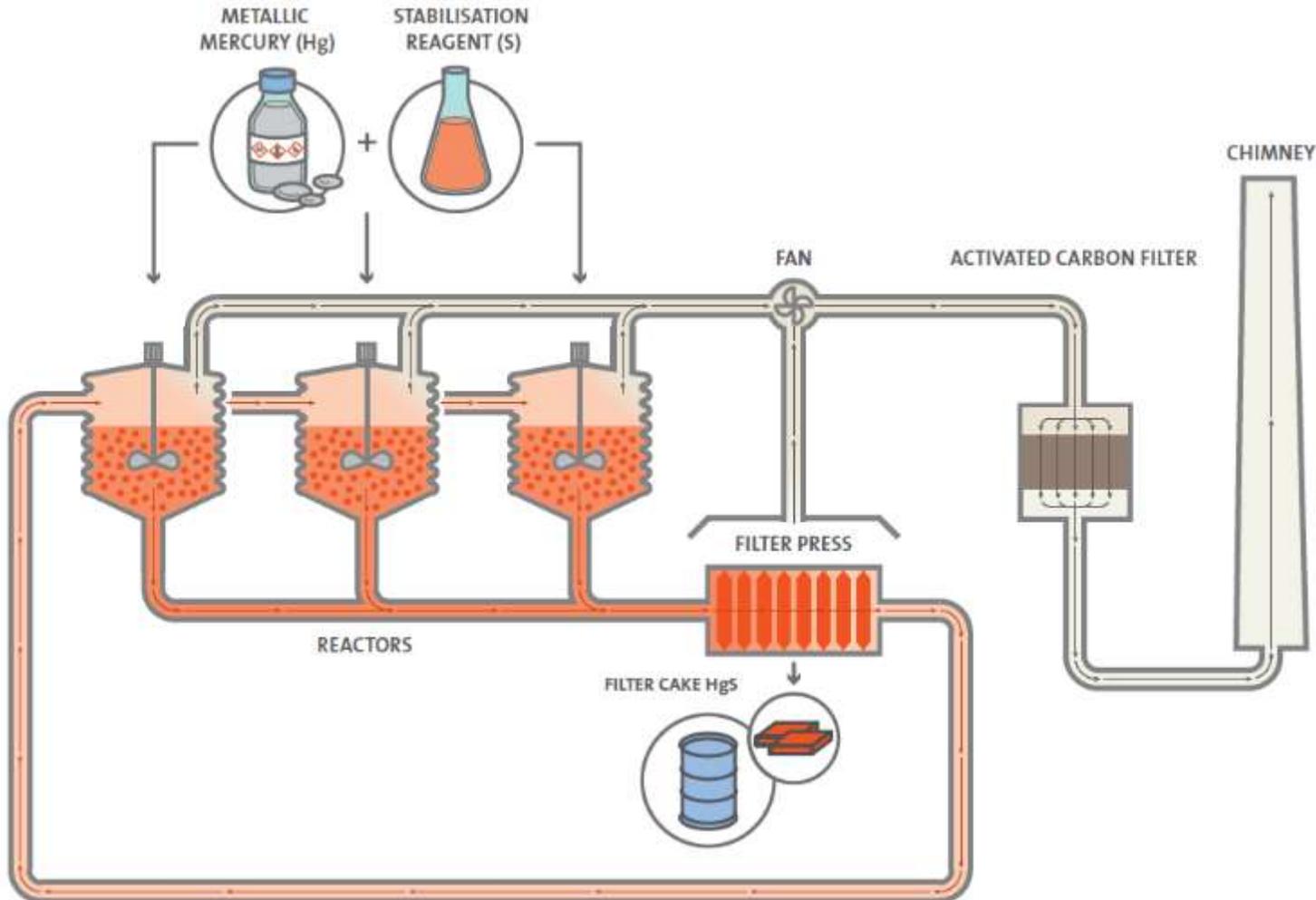


HgS is the most stable mercury compound

HgS is the most insoluble mercury compound

HgS is the natural mineral form [cinnabar] of Hg

Capacity: 1.200 t/year



## Process characteristics

- ✓ batch process
- ✓ wet process at low temperatures in a closed circuit limits the risk of Hg emissions
- ✓ no Hg vapour in the process
- ✓ stabilisation solution is regenerated  
→ zero effluents produced
- ✓ simple reactants

# Mercury Stabilisation – The Result HgS or Cinnabar



## Safe disposal of HgS in a salt mine K+S Herfa-Neurode (Germany) Long-term-safe removal of hazardous wastes from the biosphere



Acceptance criteria



### Restricted acceptance criteria

e.g.

- Not biodegradable
- Not releasing gases
- Non-liquid
- Not radioactive
- No insufficient stability of geomechanical conditions



Shaft transport



Underground transport



Storage chambers



Sealing of by walls



### Natural barriers

- Salt
- Clay
- Bunter stone

### Artificial barriers

- Waste packaging
- Brick walls...



# Mercury Stabilisation – Disposal solution - Salt Mine



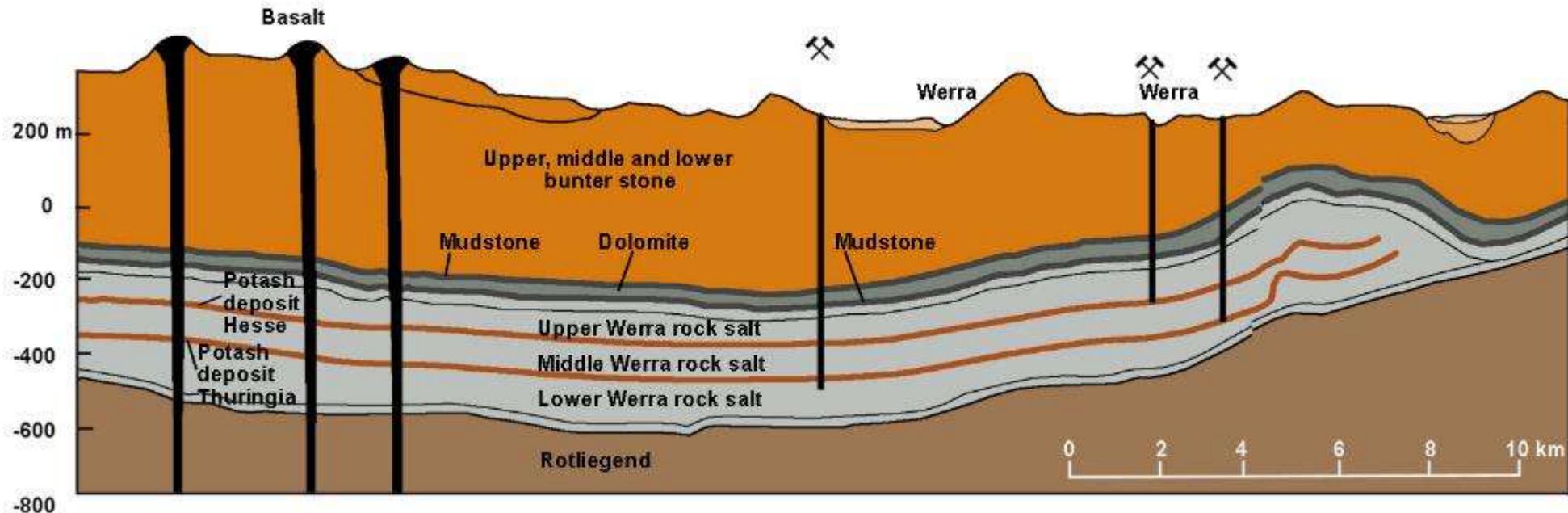
Ideal geological conditions and technical safety systems

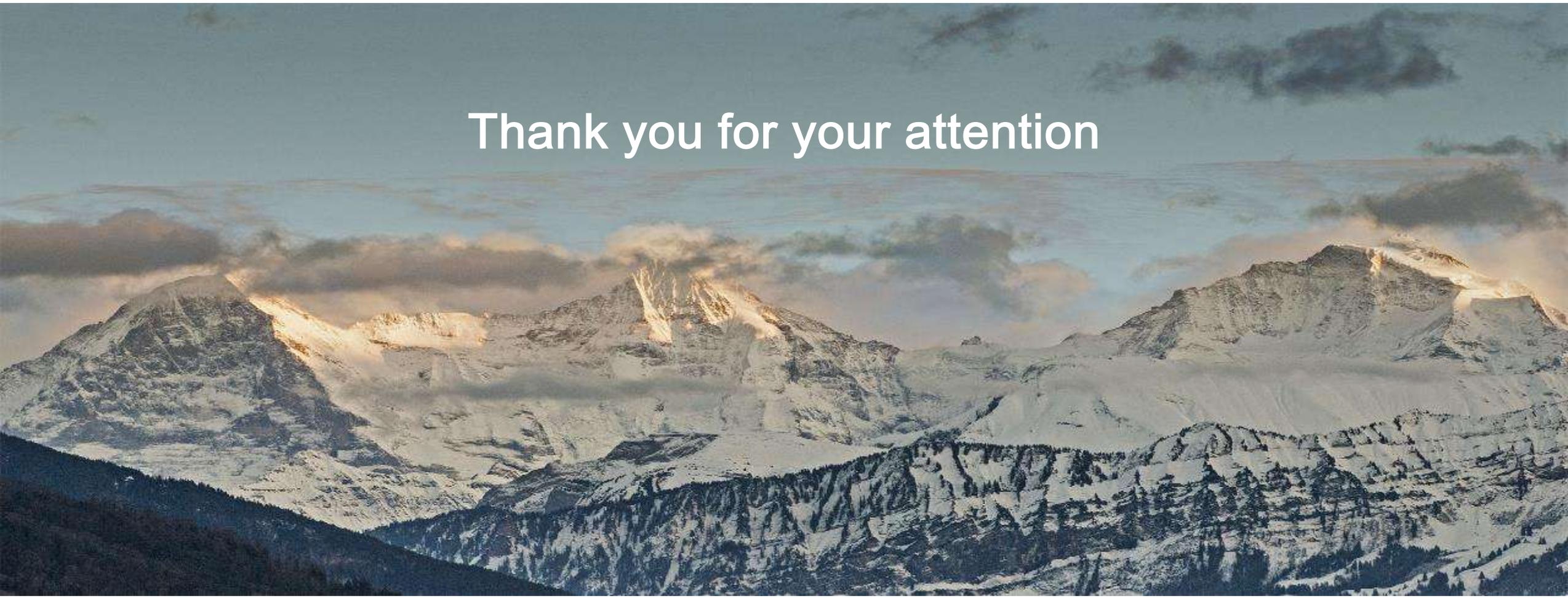


Traceability of all deposits due to detailed documentation

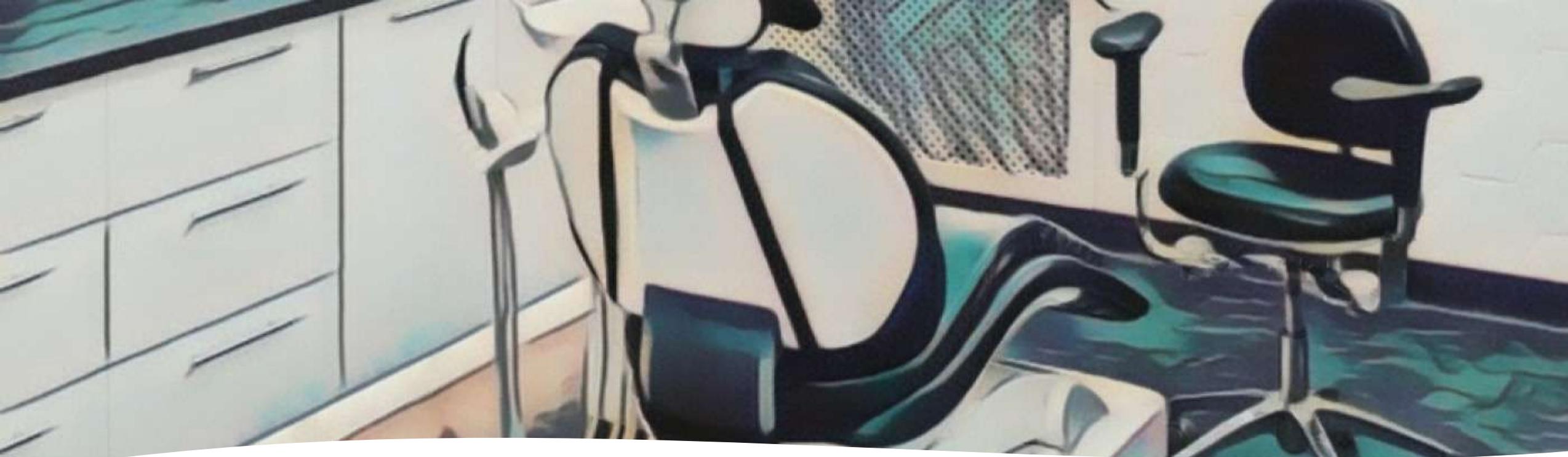


Deposit at depths of 500 to 800 metres, way below the ground water



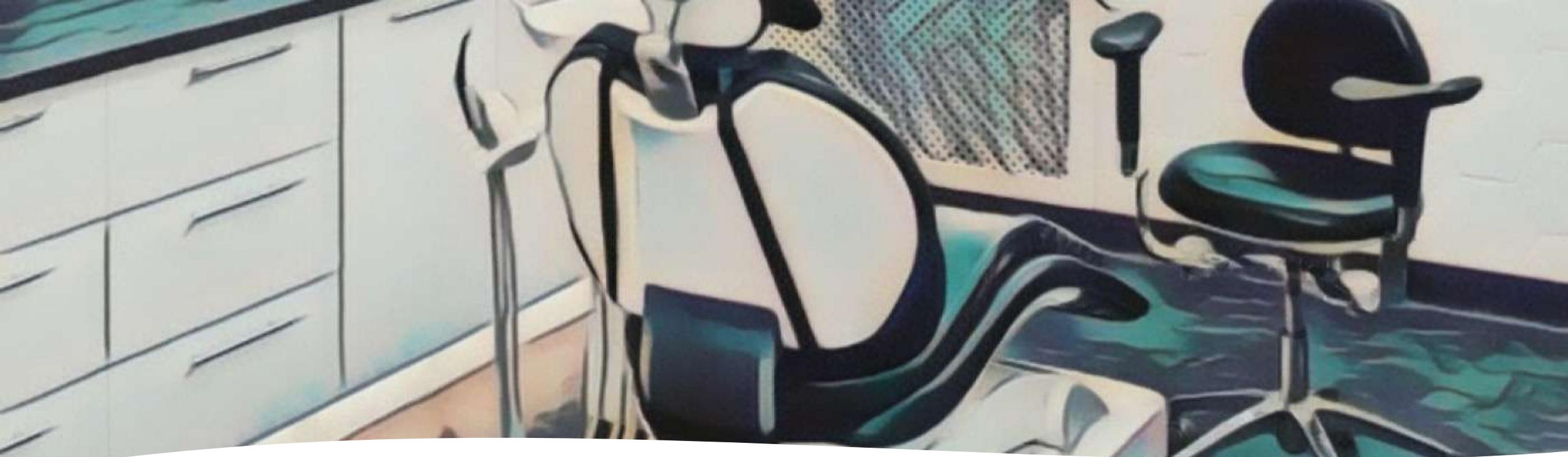


Thank you for your attention



# Questions and Answers

*facilitated by [Benoit Varenne](#), World Health Organization*



## Closing remarks

Grace Halla, *GEF Chemicals and Wastes Unit, UNEP*