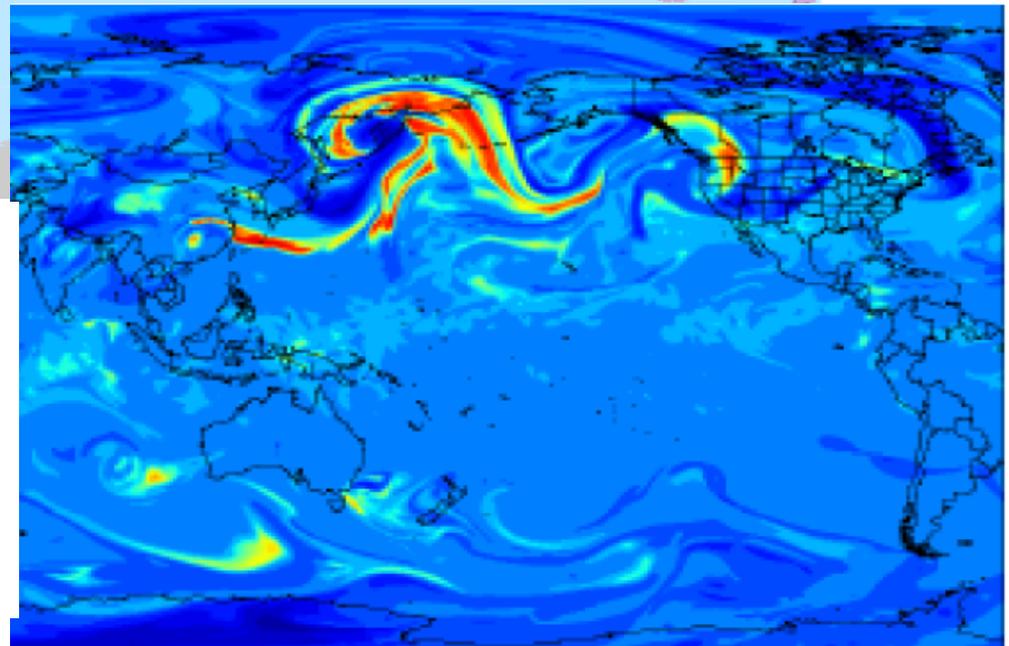
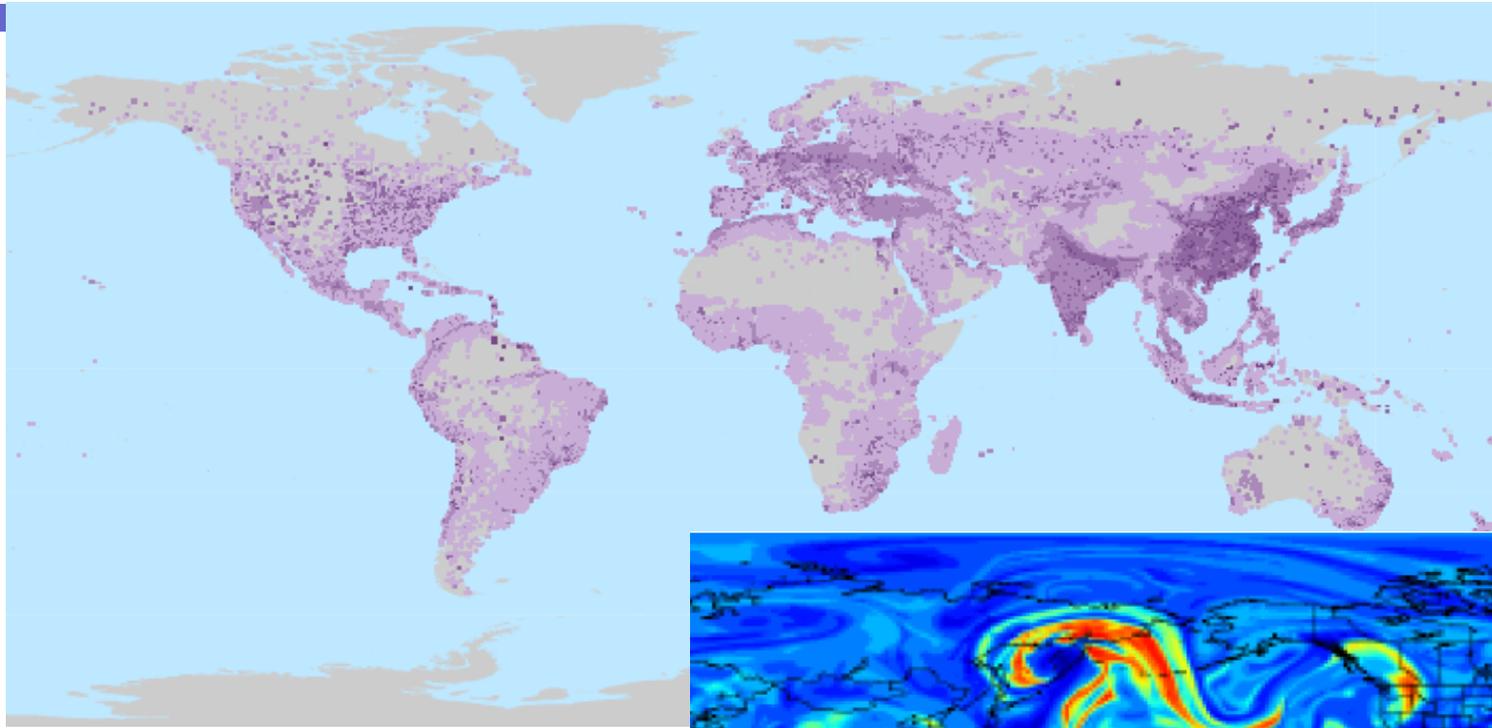


Global picture of mercury

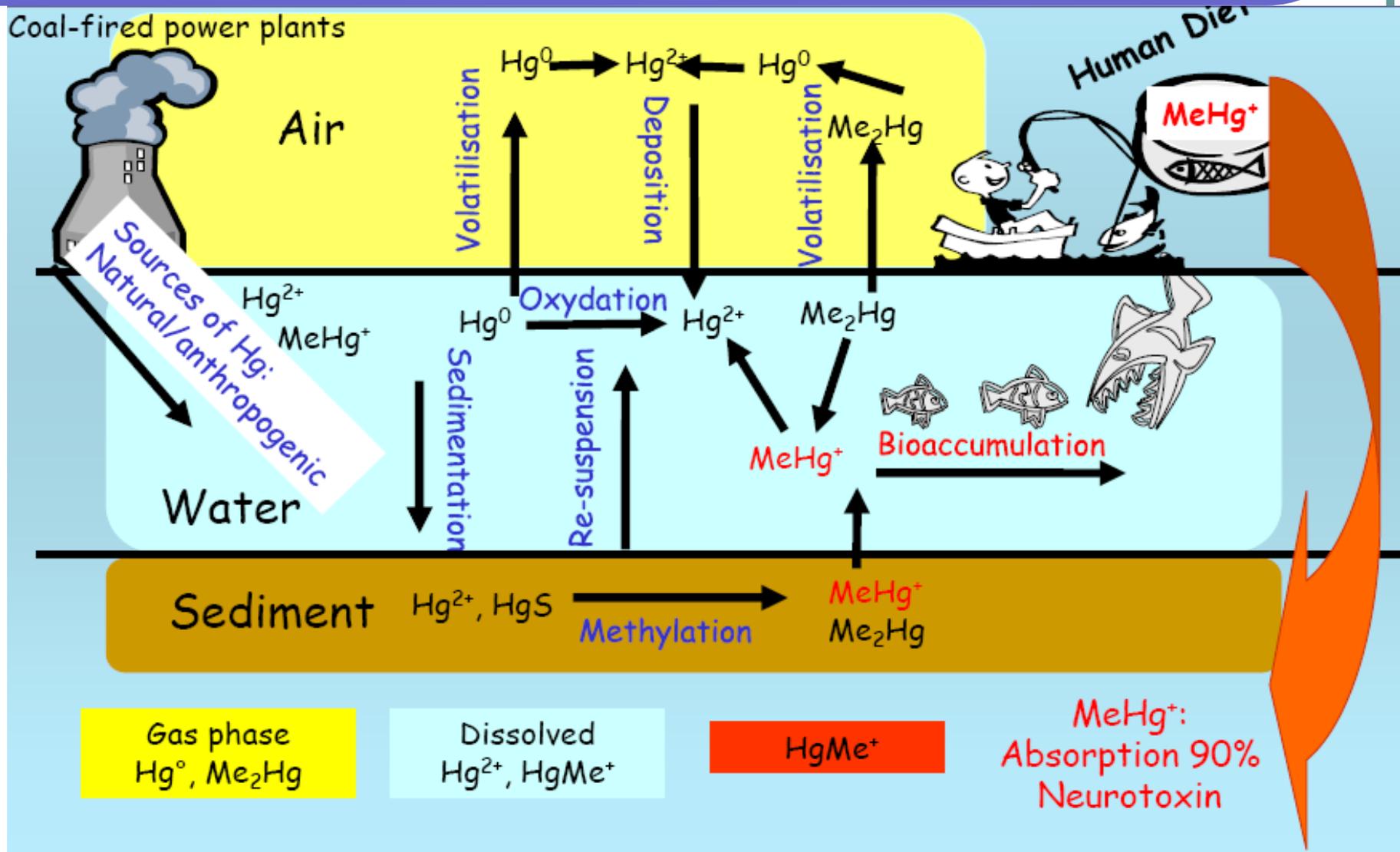
Heideloire Fiedler
Senior Scientific Affairs Officer
UNEP/DTIE Chemicals Branch
11-13 chemin des Anémones
CH-1219 Châtelaine (GE), Switzerland
E-Mail: heideloire.fiedler@unep.org

A chemical of global concern



- Long-range atmospheric transport
- Persistence in the environment
- Bio-accumulation
- Significant negative effects on human health and environment

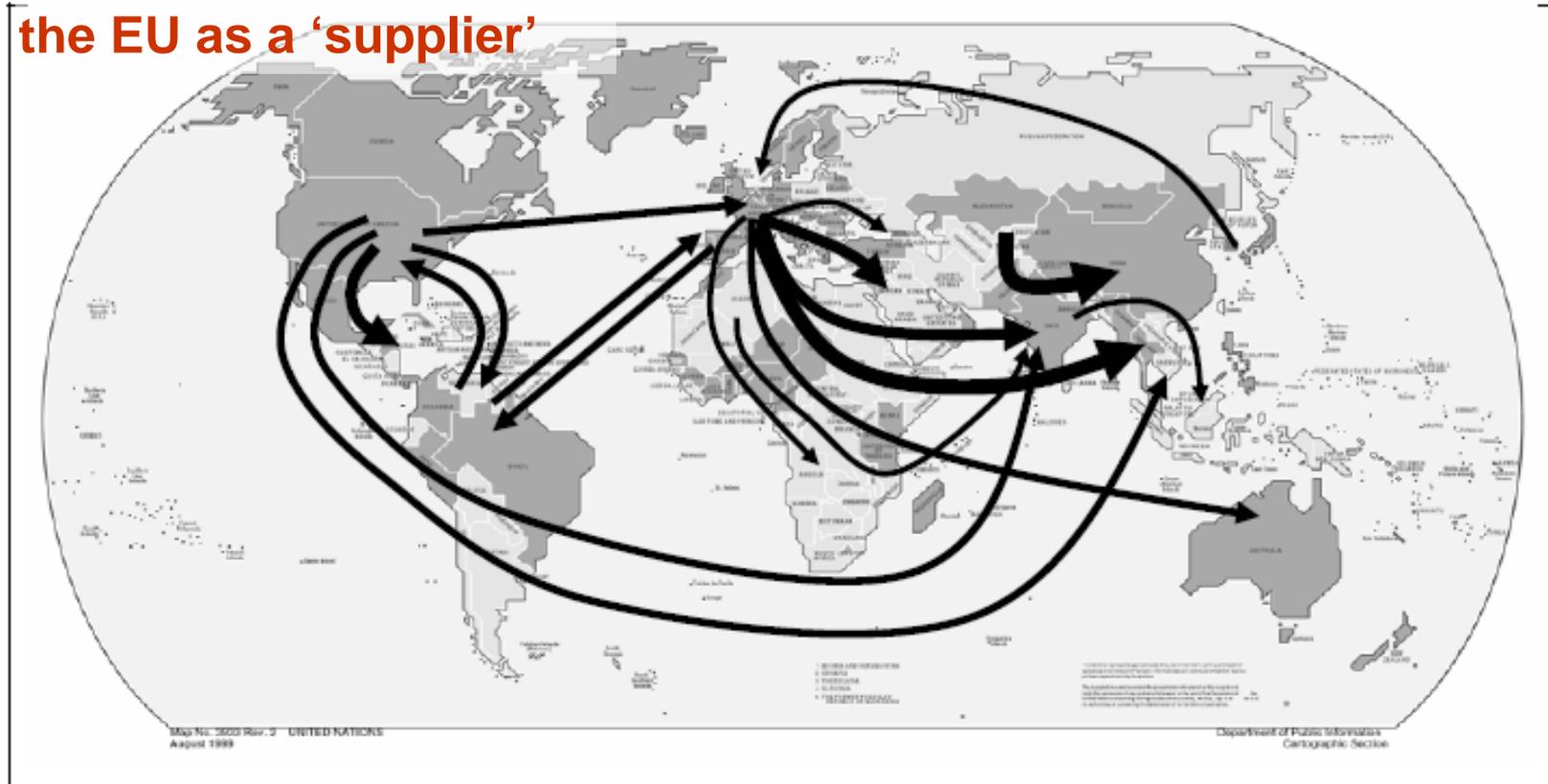
Mercury aquatic cycle



Mercury trade flows

Figure 4 Commodity mercury shipments among world regions, 2004

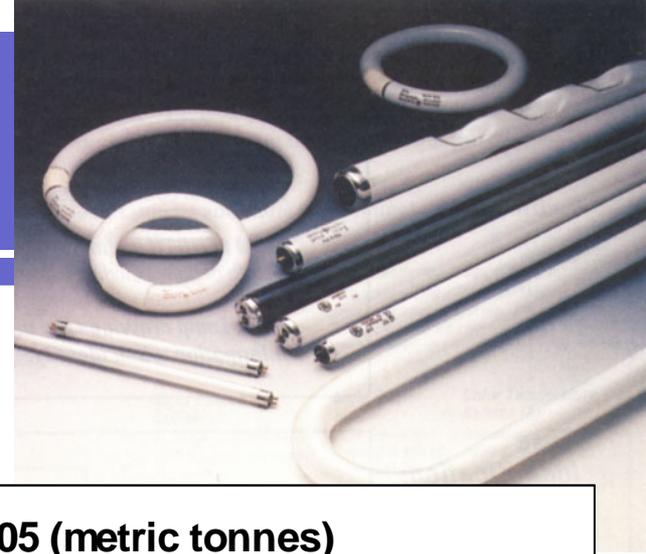
the EU as a 'supplier'



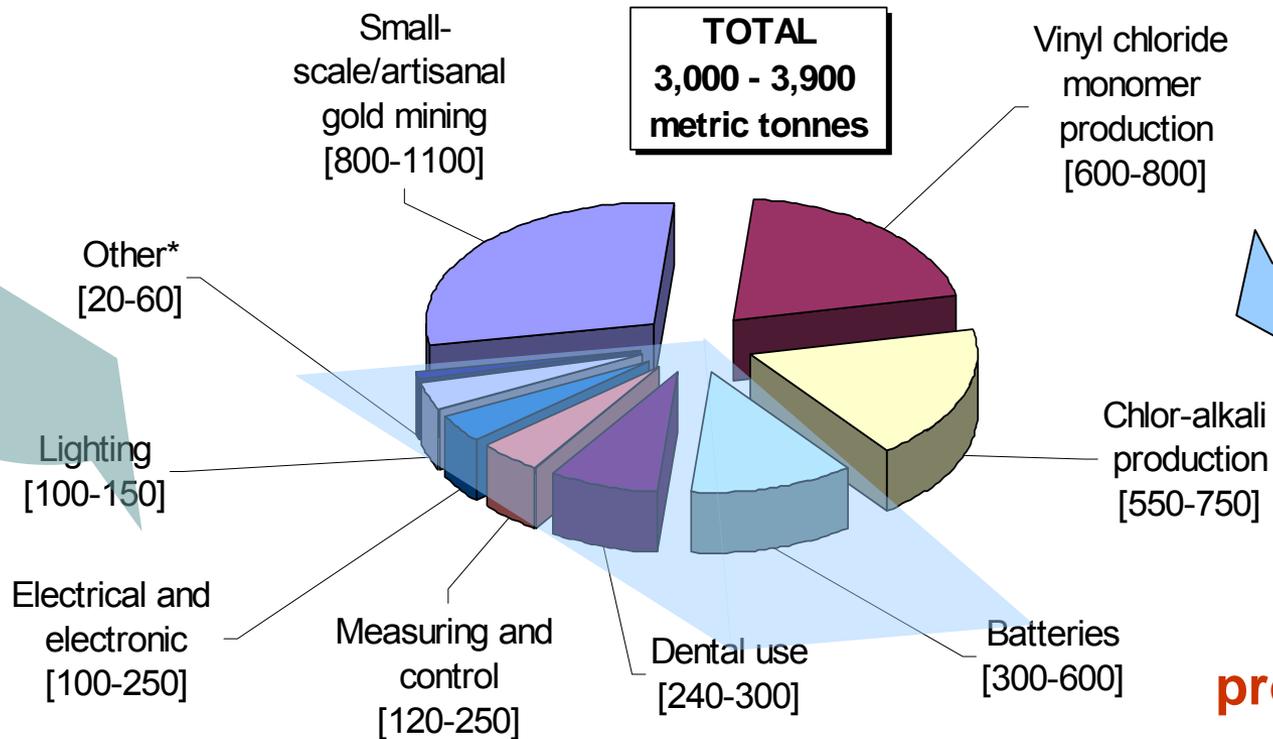
- Redundant mercury from mercury cell processes
- Internal reuse and export to ???
- Export ban

Intentional uses/demands

Driving moves towards mercury-free alternatives for products ...



Global mercury demand by use, 2005 (metric tonnes)



... and processes

* Laboratory, pharmaceutical, cosmetic, cultural/traditional uses, etc.

P. Maxson, "Mercury flows and safe storage of surplus mercury," for the Environment Directorate, European Commission, August 2006 (with data ranges). See http://ec.europa.eu/environment/chemicals/mercury/pdf/hg_flows_safe_storage.pdf

Two complementary activities

Reducing Risk from Mercury

Mercury is recognized as a chemical of global concern due to its long-range transport in the atmosphere, its persistence in the environment, its ability to bioaccumulate in ecosystems and its significant negative effect on human health and the environment.

Mercury can produce a range of adverse human health effects, including permanent damage to the nervous system, in particular the developing nervous system. Due to these effects, and also because mercury can be transferred from a mother to her unborn child, infants, children and women of child bearing age are considered vulnerable populations.

UNEP has been working to address mercury issues since 2003. Currently, the UNEP mercury programme has two main facets.



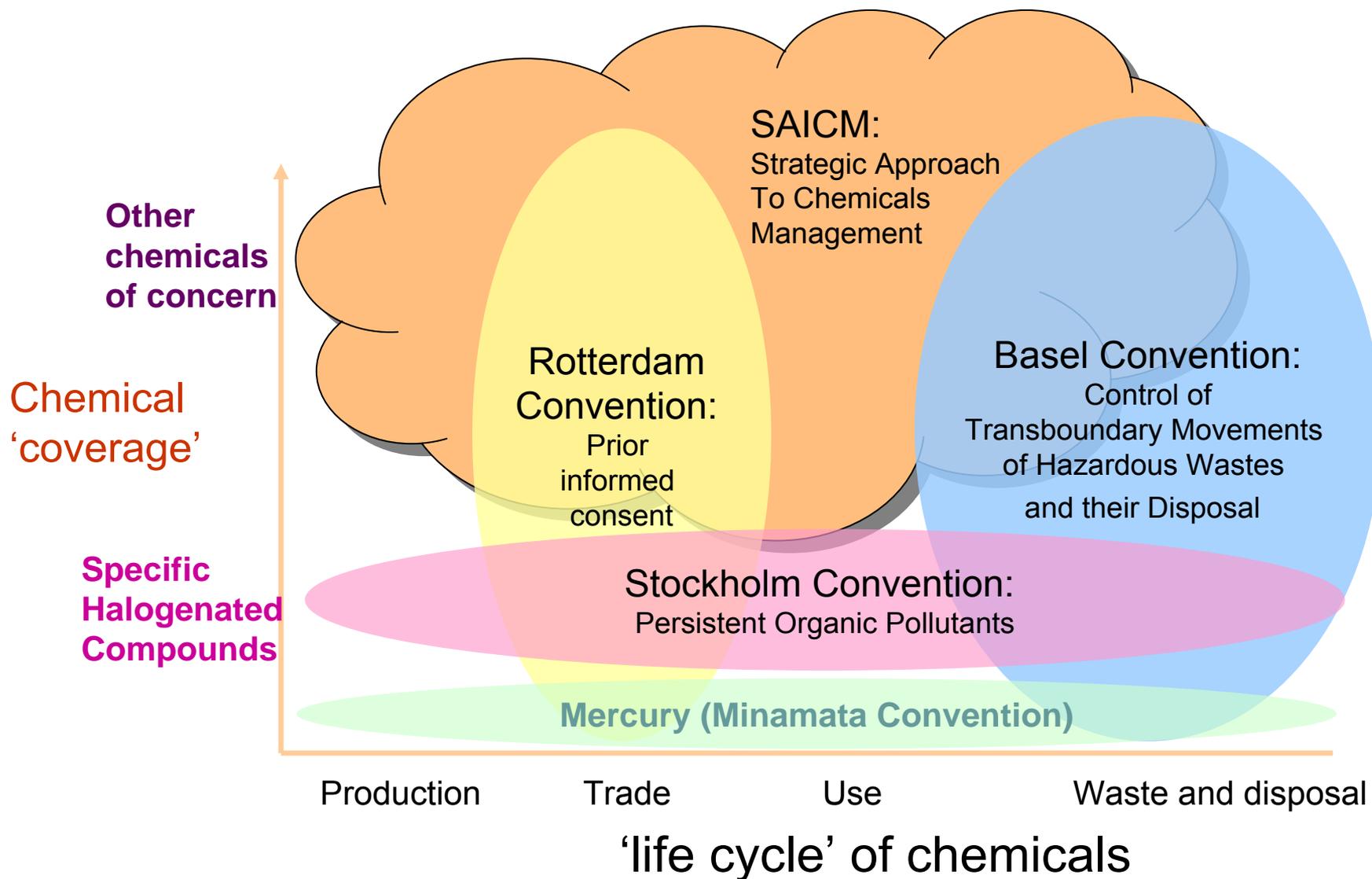
Negotiations



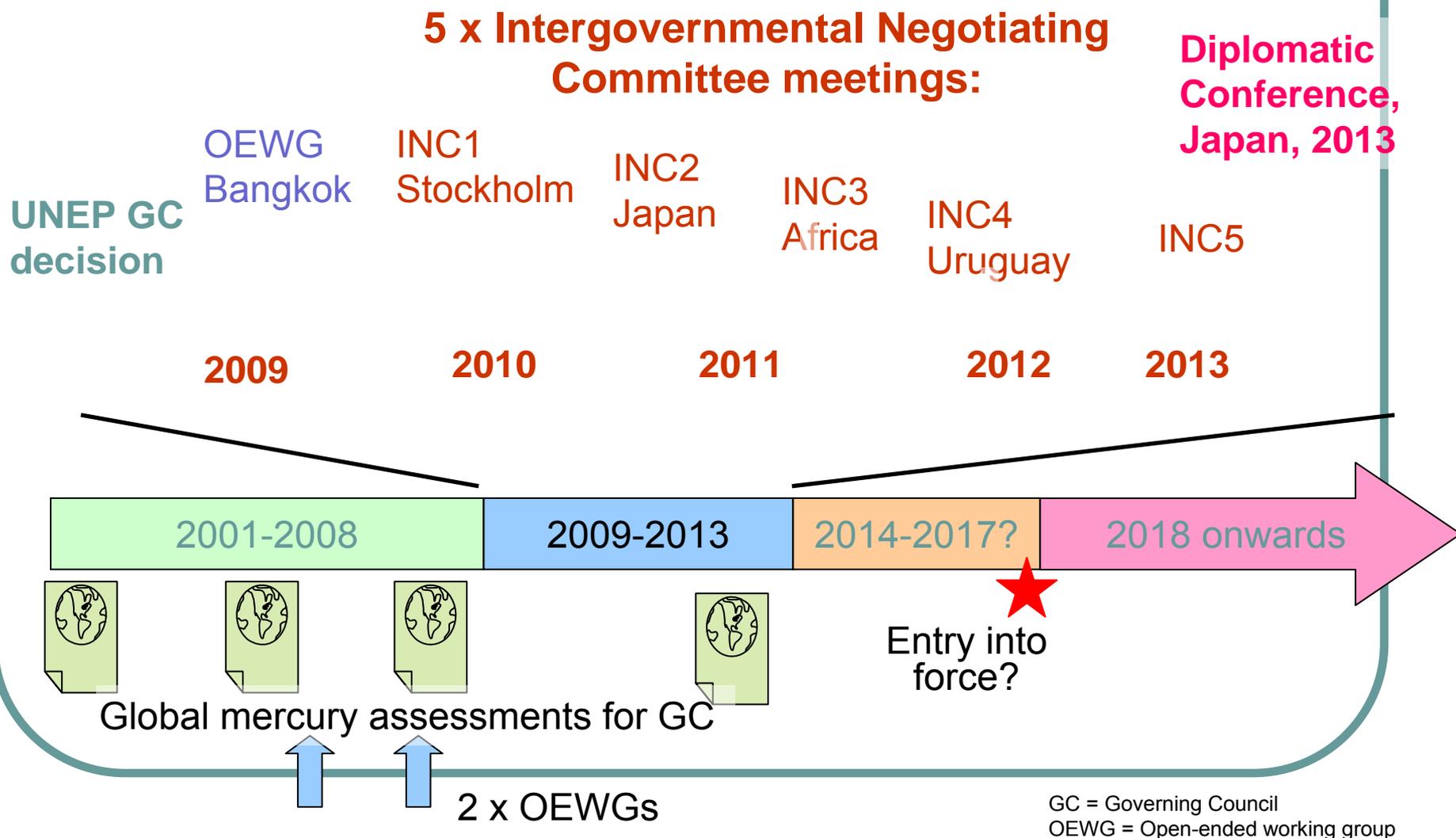
UNEP Global Mercury Partnership

President: Fernando Lugris

Scope of the chemical MEAs and agreements



The treaty negotiation process



Managing waste streams

Developing and practising environmentally sound management for:

elemental mercury



An Open Mercury Cell Chlor Alkali Plant
Source: Centre for Science and the Environment, New Delhi, "Down to Earth"

mercury containing waste



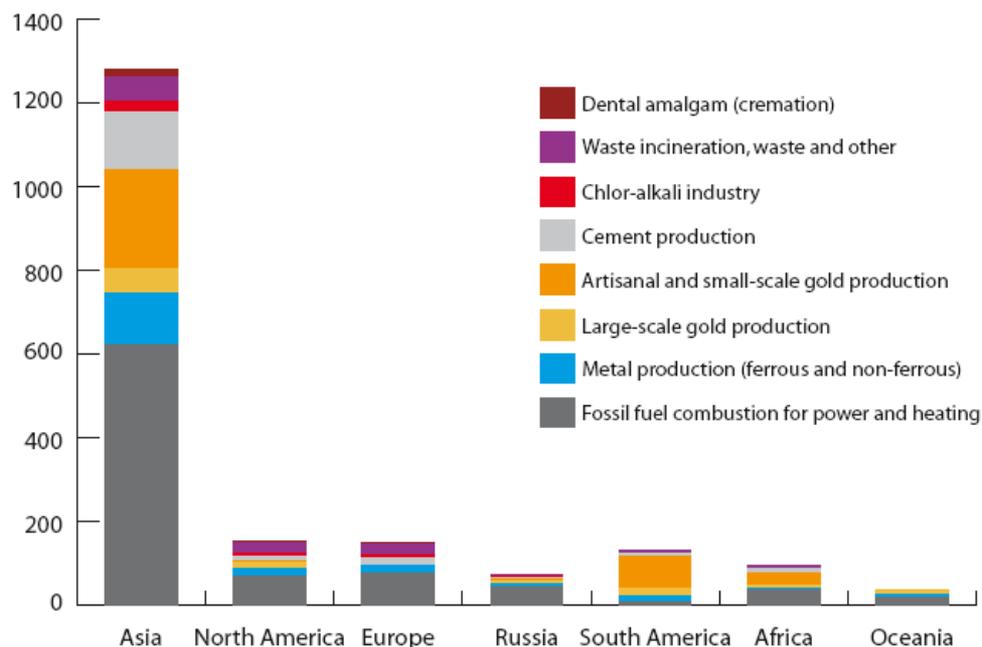
Promoting viable storage and waste management options - including stabilization



Unintentional releases

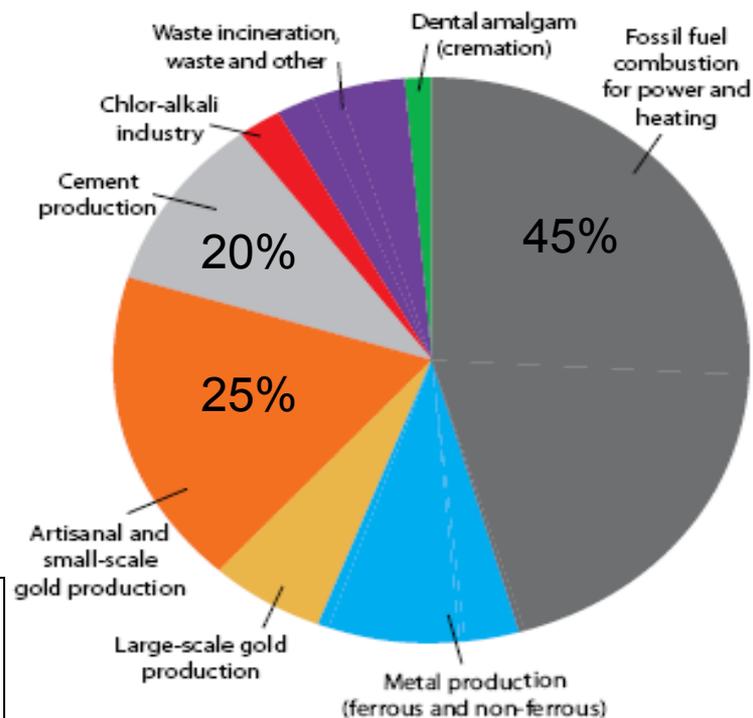
Emissions of mercury to air in 2005 from various anthropogenic sectors in different regions

Mercury emissions, tonnes



Year 2005 emissions by Sector
(approx. 1,930 t per year)

Tackling emissions to air from key sectors and managing resulting residues and wastes



Global Mercury Partnership

Voluntary arrangements and complementary to negotiations for Minamata Convention



United Nations Environment Programme
environment for development

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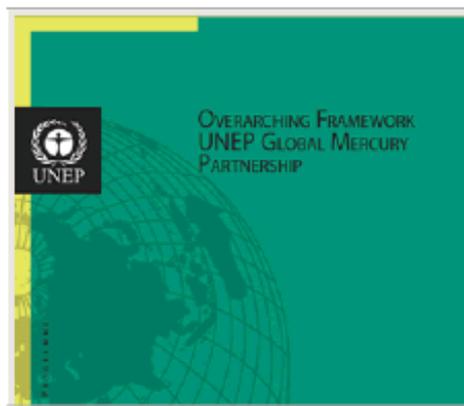
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Harmful Substances

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[Mercury > Global Mercury Partnership]

UNEP Global Mercury Partnership



Governments initiated partnership activities at Governing Council 23 and have subsequently strengthened the role of partnerships to effectively deliver mercury activities.

Governing Council 25/5 specified the UNEP Global Mercury Partnership as one of the main mechanisms for the delivery of immediate actions on mercury during the negotiation of the global mercury convention.

The overall goal of the UNEP Global Mercury Partnership is to protect human health and the global environment from the release of mercury and its compounds by

minimizing and, where feasible, ultimately eliminating global, anthropogenic mercury releases to air, water and land.

The Partnership currently has seven identified Priorities for Action (or partnership areas) that are reflective of the major source categories.

To become a partner, interested entities or individuals should submit a letter to UNEP signifying their support for the UNEP Global Mercury Partnership and their commitment to achieving its goal, and specifying how they will contribute to meeting the goal of the UNEP Global Mercury Partnership.

Further Resources

- What's new?
- Overarching Framework
- Current Partners
- Becoming a Partner
- Partnership Advisory Group
- Report on Activities 2009-2010
- Report on Activities 2007-2008
- Country Support

Priorities for Action

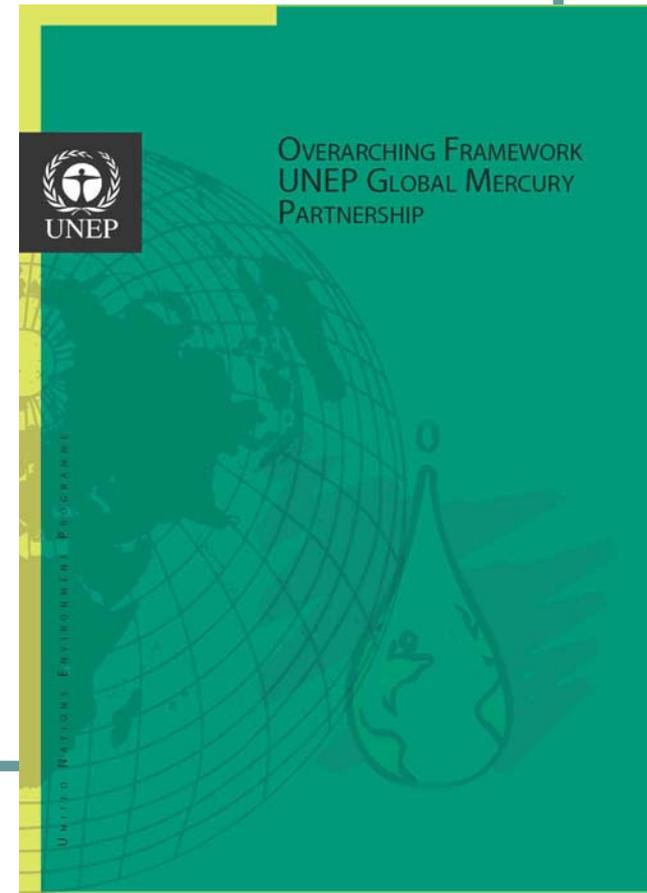
- Reducing Mercury in Artisanal and Small-Scale Gold Mining
- Mercury Control from Coal Combustion
- Mercury Reduction in the Chlor-alkali Sector
- Mercury Reduction in Products
- Mercury Air Transport and Fate Research
- Mercury Waste Management
- Mercury Supply and Storage

Presently 7 Partnership Areas

1. Artisanal/small-scale gold mining
2. Coal combustion
3. Chlor-alkali sector
4. Air transport and fate research
5. Reduction in products
6. Waste management
7. Supply and storage

Other possible areas:

- cement production
- non-ferrous metals mining



Toolkit for release inventories



UNITED NATIONS
ENVIRONMENT PROGRAMME

CHEMICALS



TOOLKIT FOR IDENTIFICATION AND QUANTIFICATION OF MERCURY RELEASES

**Guideline
for Inventory Level 1**

Version 1.1

January 2011



IOMC

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS
A cooperative agreement among UNEP, ILO, FAO, WHO, UNIDO, UNITAR and OECD



UNITED NATIONS
ENVIRONMENT PROGRAMME

CHEMICALS



TOOLKIT FOR IDENTIFICATION AND QUANTIFICATION OF MERCURY RELEASES

**Reference Report
Revised Inventory Level 2 Report**

Including

Description of Mercury Source Characteristics

Version 1.1, January 2011



IOMC

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS
A cooperative agreement among UNEP, ILO, FAO, WHO, UNIDO, UNITAR and OECD

Mercury waste management partnership

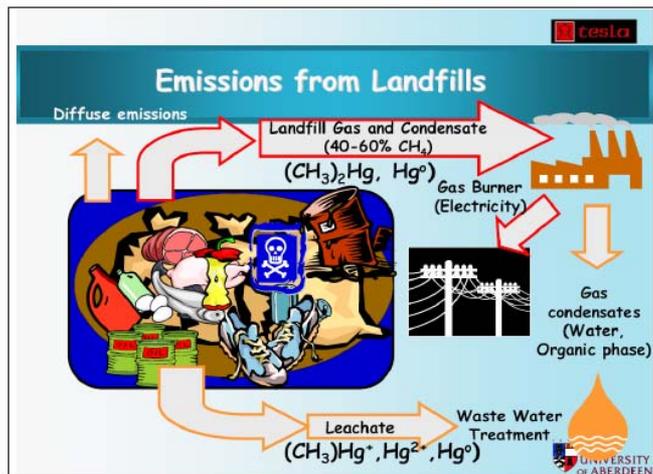


United Nations Environment Programme



Management of Mercury and Mercury-Containing Waste

Final Project Report



UNEP/DTIE
Chemicals Branch
June 2010

Five countries:

BKF, KHM, CHL, PAK, PHL

Develop national (waste) management plans

Comment on Draft technical guidelines on mercury waste (SBC)

Analytical services through an accredited laboratory (Tesla, Aberdeen University) was offered

Mercury analysis



Cold Vapour Atomic
Fluorescence Spectrometry
(CV-AFS)

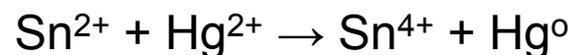


Table 9-1: Determination of total mercury in CRMs NIES 13 and IAEA -085

<i>Certified reference material</i>	<i>Total mercury</i>		
	Certified value ($\mu\text{g/g}$)	Measured value ($\mu\text{g/g}$) $\bar{x} \pm \text{SD}$	Recovery (%)
NIES No13	$4.42 \pm 0.2 \mu\text{g/g}$	4.40 ± 0.1	99.6 ± 0.05
IAEA 085	$23.2 \pm 0.8 \mu\text{g/g}$	23.18 ± 0.05	99.9 ± 0.05

* Results are given as average \pm standard deviation (n=3)

Matrices submitted and results

Country	Type of samples	No of samples	median mg/kg	min-max mg/kg
Burkina Faso	Hair samples from people working in ASGM	17	3.95	0.41-7.10
	Hair samples from people living in ASGM area but not involved in mining activities	11	0.75	0.01-2.50
Cambodia	Soil and sludge from public drainage system near hospitals, dental clinics, municipal waste dumps	37	0.41	0.06-6.92
	Toenail samples from people working in ASGM	11	1.28	1.05-3.51
	Hair samples from people working in ASGM	12	3.21	1.30-5.76
Chile	Soil samples from a waste dump resulting from gold mining	31	0.28	0.12-0.92
	Soil samples as controls	2		0.02-0.04
Pakistan	Hair samples from people working at chlor alkali plant with active amalgam technology	23	177	3.3-9,340
	Hair samples from people working at chlor alkali plant at which amalgam was phased out	9	2.30	1.7-20.2
	Hair samples from workers in dental clinics	22	2.26	0.45-4.86
	Hair samples from control group	18	0.39	0.05-4.73

National Reports - Tailings

INFORME DE AVANCE 1

PROYECTO N° 1588-155-LE09

MANEJO DE DESECHOS DE Y CON
CONTENIDO DE MERCURIO

PARA:

COMISIÓN NACIONAL DE MEDIO AMBIENTE

PREPARADO POR:

PROGRAMA DE MEDIO AMBIENTE
FUNDACIÓN CHILE



Technical and Economic Criteria for Processing Mercury- Containing Tailings

Final Report

United Nations Environment Programme
Division of Technology, Industry, and Economics
Chemicals Branch

April 2010

IOMC

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS
A cooperative agreement among UNEP, ILO, FAO, WHO, UNIDO, UNFPA and OIEAD

SBC Technical Guidelines

Technical Guidelines for the Environmentally Sound Management of Wastes Consisting of Elemental Mercury and Wastes Containing or Contaminated with Mercury – 6th Draft ver.2

6th Draft ver.2 (December 2010)

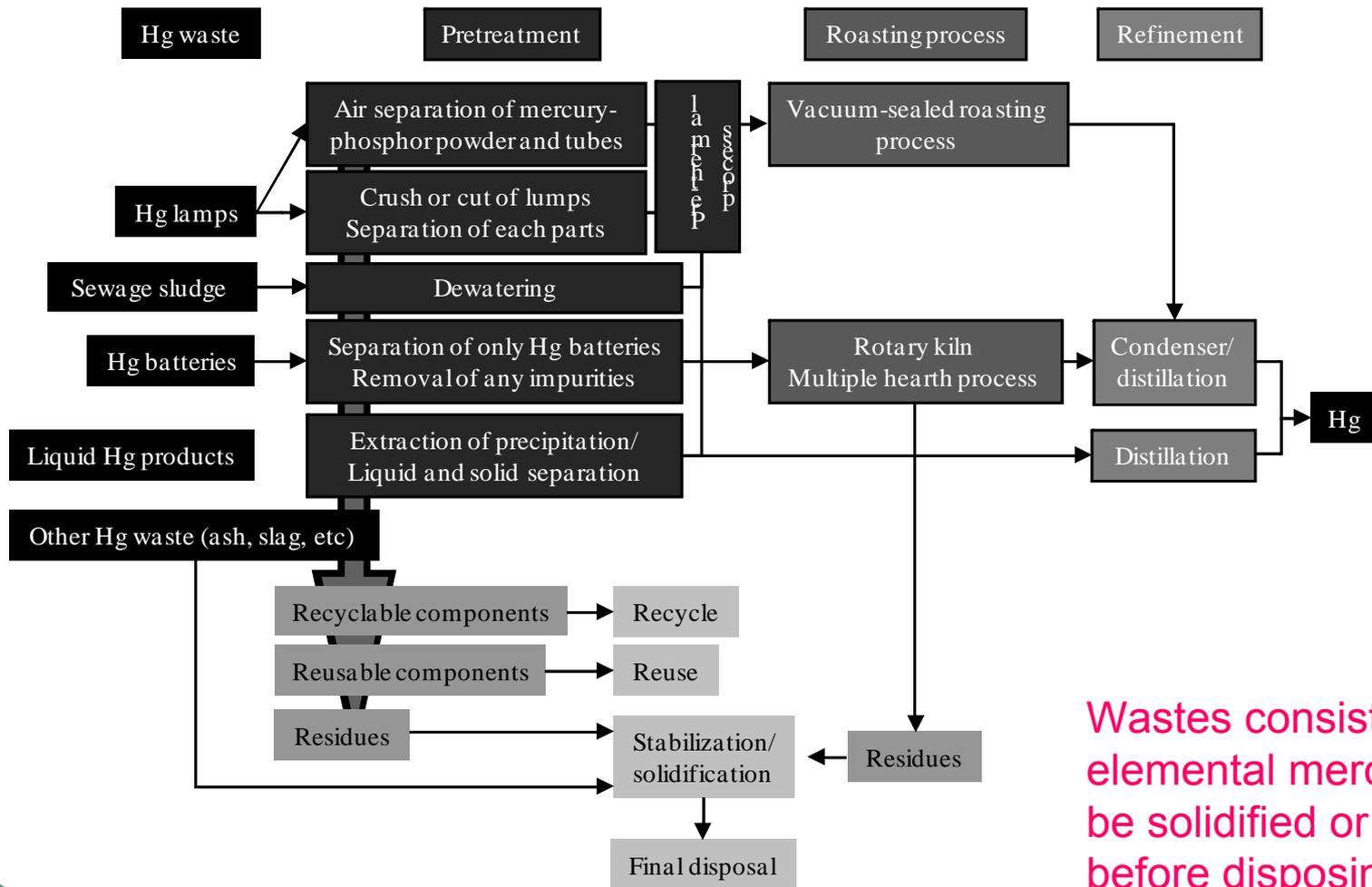
Note: The guidelines contain the comments, remarks and notes that the members of the Small Intersessional Working Group (SIWG) proposed on the previous draft (6th Draft October 2010). SIWG will consider these comments, remarks and notes after the period to invite the Parties and others to submit their comments by 28 February 2011 pursuant to the para 5 of decision of OEWG-VII/7. Editorial work will be undertaken after 31 July 2010 when the period to invite the Parties and others for their comments was ended pursuant to the para 6 of the decision of OEWG-VII/7.

Permanent Storage of Wastes containing or contaminated with mercury

Wastes containing or contaminated with mercury (including elemental mercury after stabilization or solidification, if appropriate after a solidification or stabilization, meeting the acceptance criteria for permanent storage can be permanently stored in special containers at designated areas, such as an underground storage facility.

<http://www.basel.int/techmatters/mercury/guidelines/2010-12-01.doc>

Hg recovery from municipal waste



Wastes consisting of elemental mercury should be solidified or stabilized before disposing of in such facilities.

Chloralkali partnership



United Nations Environment Programme
environment for development

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UNEP's Work

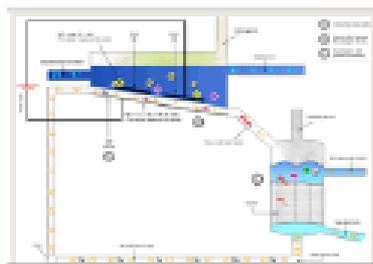
UNEP in the Regions

News

UNEP Experts

[Mercury > Priorities for Action > Chlor-alkali Sector]

Mercury Reduction in the Chlor-alkali Sector



Mercury cell chlor-alkali production is a significant user of mercury and a source of mercury releases to the environment. The mercury used in this process acts as a catalyst in the chlorine production process.

Mercury cell production facilities that close or convert to mercury-free technologies require environmentally sound management of mercury surplus and waste.

Best practices, such as proper waste management, can minimize the release of mercury. Mercury-free technologies are also available in chlor-alkali production.

Image courtesy of Eurochlor, Mercury Cell animation.

Partnership Area Lead



US Environmental Agency Protection

Mr. Martin Dieu

Further Resources



Issue

[Partnership Business Plan](#)

[Activities & Projects](#)

[Partners](#)

[Reports & Publications](#)

[Meetings & Meeting Documents](#)

World Chlorine Council (WCC) is a partner since April 2009

Partnership objectives and indicators

- The objective of this partnership area is to minimize significantly and, where feasible, eliminate global mercury releases to air, water and land that may occur from chlor-alkali production facilities
- Indicators
 - Percent reduction in mercury use per metric ton of chlorine production
 - Percent reduction in Hg emissions per metric ton of Cl production
 - Percent reduction in mercury use by the chlor-alkali industry,
 - Percent reduction in Hg emissions and use by the chlor-alkali industry,
 - Number of chlor-alkali units with mercury-cell technology decommissioned.

Partnership reports

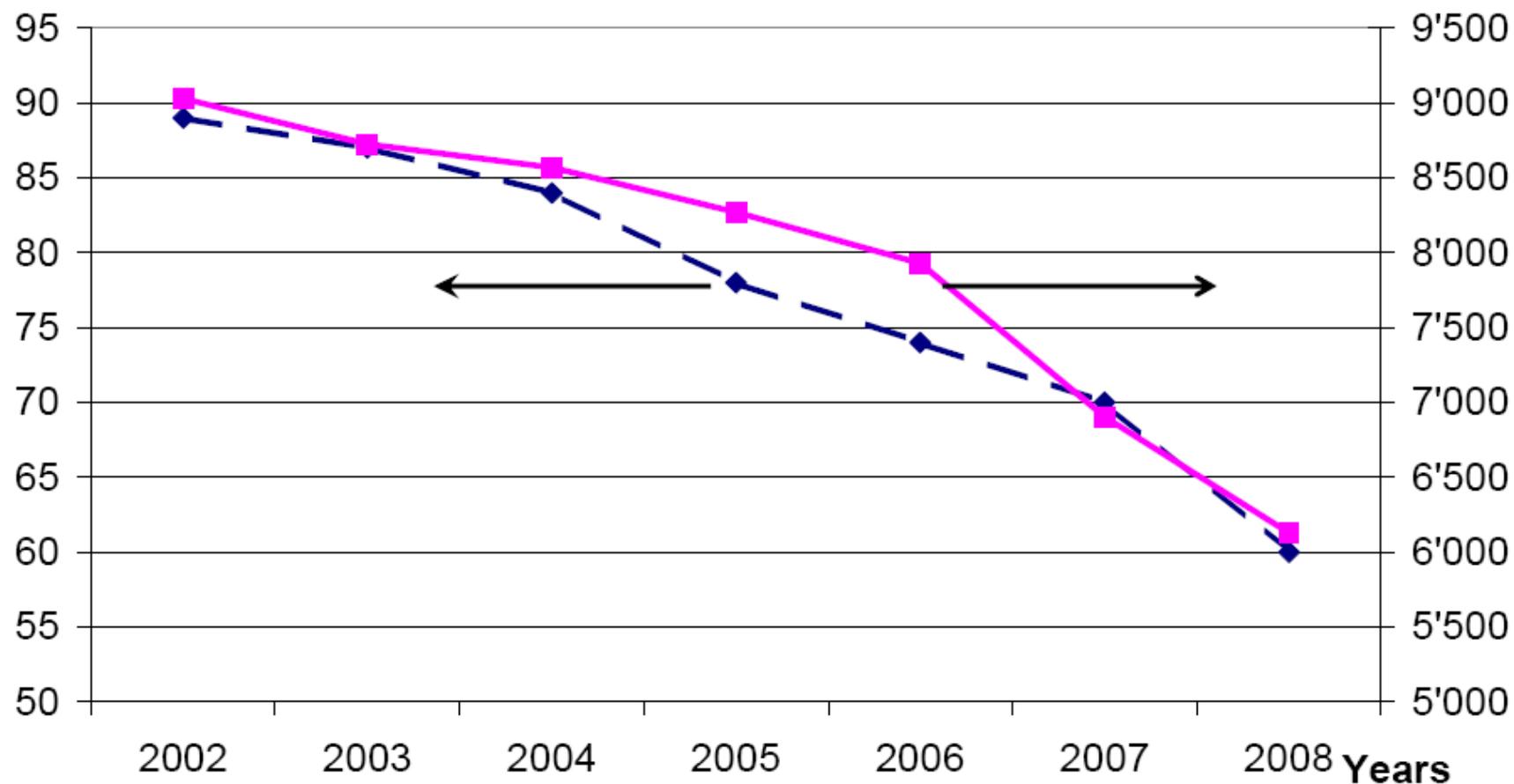
- Database of global mercury cell chlorine capacity finds:
 - 100 facilities in 44 nations have mercury cell chlorine capacity.
 - Between 2005 and 2010, global capacity declined by 28 %.
 - 6.5 mio t p.a. remain worldwide, 2005 had 9 mio t p.a.
 - 35 facilities in 13 countries have eliminated 2.6 mio t p.a. of mercury cell chlorine capacity since 2005.
 - 20 facilities in 10 countries have announced to eliminate a total of 1.9 million tons per year of mercury cell chlorine capacity in the next five years
- WCC report on mercury consumption and emissions
 - Hg emissions declined from 23.3 t p.a. in 2002 to 6.4 t p.a. in 2009 (7.4 t for 2008, 8.6 t for 2007)
 - The number of MCCA plants dropped to 58 in 2009 (85 in 2002, 70 in 2007, 60 in 2008).

WCC - Chlor-Alkali Industry

Number of plants and capacity of mercury electrolysis units
in USA/Canada, Europe, Russia, India and
Brazil/Argentina/Uruguay

Number of
plants

Capacity of
plants (1000 t/y)



Consultation on waste and storage

- Some funding available from government of Norway
- Meeting in Geneva, 23 Sep 2010
- Linking UNEP projects on mercury waste and storage
- Three pilot projects proposed (handyness)
 - Toolbox on awareness raising in households
 - Health care sector (video)
 - Chloralkali BEP application



United Nations Environment Programme



Consultation Meeting on Mercury Waste and Storage

23 September 2010, Geneva



UNEP/DTIE
Chemicals Branch
November 2010

Pakistan hair samples

Location	n	Mean mg / kg	Range
Chlor alkali plant with active amalgam technology	23	177	3.3-9,340
Hair samples from people working at chlor alkali plant at which amalgam was phased out	9	2.30	1.7-20.2
Hair samples from workers in dental clinics	22	2.26	0.45-4.86
Hair samples from control group	18	0.39	0.05-4.73

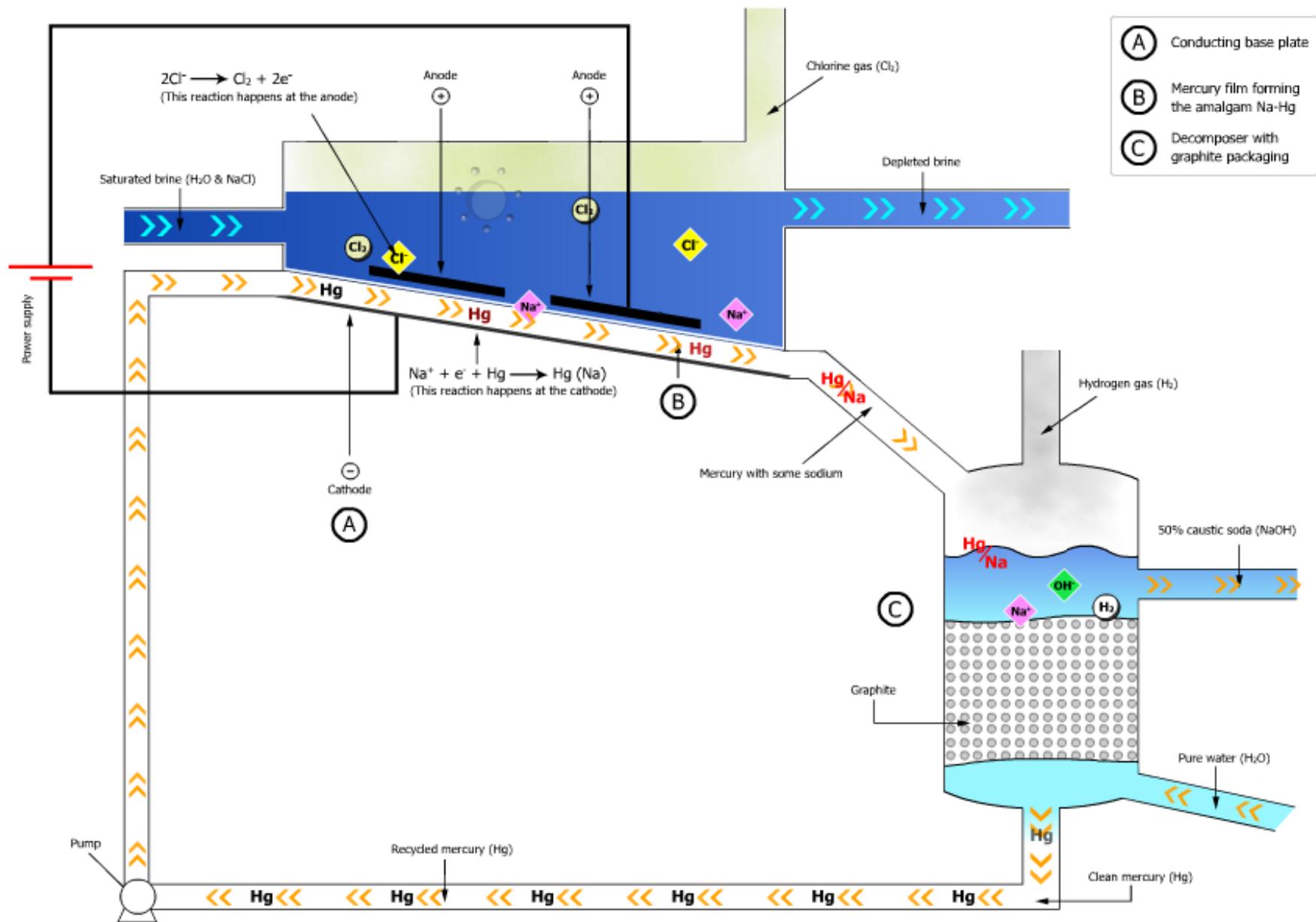
Cooperation of many partners

- United Nations Environment Programme (UNEP)
 - through Global Mercury Partnership
- World Chlorine Council (WCC)
 - International Council of Chemical Associations (ICCA)
 - Chlorosur
- Government of Uruguay
 - through DINAMA and LATU with Ministry of Industry, Ministry of Foreign Affairs
- Efice S.A.

Implementation of guidance document in the chlor-alkali sector (1)

- Starting point: WCC guidance documents on how to handle metallic mercury
- Objectives
 - Check applicability and improve if relevant these existing guidelines
- Process – Plan: identify country, plant, consultant
- Check:
 - if company is aware of WCC guidelines, what they use, translation necessary?
 - Check flow of mercury – where would metallic mercury come from within the plant and would need to be handled safely through the process
 - Check interim/temporary storage on site facilities / spills handling?
- Implementation on site with the expert of the guidelines
 - Is the company implementing some guidelines already? Are they the same? If not what are the differences?
 - Are things missing from guidelines? how can these be improved?
 - Are they useful to the company?
 - What are the gaps in storage? handling?
- Meeting with relevant authorities and industry and stakeholders for wider awareness raising

Mercury Cell



Publications/guidelines for facilities

1. Determination of Mercury in Gasses
2. Determination of Mercury in Liquids
3. Determination of the total weight of mercury in the electrolysis cells by radiosotopes
4. Determination of Mercury and Creatinine in Urine
5. Decommissioning of Mercury Chlor-Alkali Plants
6. Guidelines for the measurement of air flow and mercury in cellroom ventilation
7. Code of practice mercury housekeeping
8. Guidelines for making a mercury balance in a chlorine plant
9. Guideline for the minimisation of mercury emissions and wastes from mercury chloralkali plants
10. Management of mercury contaminated sites
11. Guideline for preparing an audit of the mercury balance in a chlorine plant
12. Guidelines for the preparation for permanent storage of metallic mercury above ground or in underground mines

Chlorine Institute Publications

- Guidelines for Conducting a Mercury Balance
- Guidelines for Mercury Cell Chlor-Alkali Plants Emission Control - Practices and Techniques
- Guidelines for Technologies to Reduce Mercury in Sodium Hydroxide
- Guidelines for the Optimization of Mercury Treatment - Ed 1 - Final Dec 2003
- Pamphlet 125 - Medical Surveillance and Hygiene Monitoring Practices - Mercury – Ed4 - (JAN 2004)
- Country Initiatives on chlor alkali technology changeover: Sao Paulo, Brazil

Pilot project (2)

- Potential benefits
 - Applicability of guidelines validated and improved
 - Plant assisted to apply safe handling
 - Transparency provided for government, public etc
 - Potential reduction on mercury emissions from handling/storage
 - Increased awareness
- Applications for consideration (at the meeting)
 - Uruguay (WCC member)
 - Pakistan (non-member)

WCC cooperation agreement

- “Negotiated” between WCC (Arseen Seys) and UNEP (HF) at end 2010/early 2011
- WCC to provide expertise
- UNEP signed agreement with DINAMA through LATU for local arrangements
- UNEP to sign agreement with MoU Pakistan for arrangements on site visits
- UNEP to pay for travel/daily allowance for WCC expert and UNEP staff
- Uruguay site visit: 4-8 April 2011
- Pakistan: Visit to Germany (2-5 May 2011) followed by site visit in PAK (June 2011)

Activities undertaken

- Formal endorsement by company received Nov 2010
- UNEP agreement with DINAMA/LATU on 25 Feb 2011
- Objectives:
 - Assess and communicate application of industry guidelines on best practices with respect to use and handling of mercury.
- Outputs
 - Report of compliance visit at the chloralkali plant, signed by industry and experts;
 - Government of Uruguay and relevant stakeholders aware on best practices on mercury handling in the chloralkali industry;
 - Contribution by the Government of Uruguay to the intergovernmental negotiations on a legally binding instrument on mercury

Endorsement Uruguay – Nov 2010

Misión Permanente del Uruguay
ante la Oficina de Naciones Unidas y
Organismos Especializados

NV/377/2010

La Misión Permanente del Uruguay ante la Oficina de las Naciones Unidas y Organismos Especializados con sede en Ginebra, presenta sus más atentos saludos al Programa de las Naciones Unidas para el Medio Ambiente – División Químicos y tiene el honor de referirse al tema Mercurio.

Al respecto esta Misión cumple en adjuntar copia de la Nota del Director Nacional de Medio Ambiente, Arq. Jorge Rucks, manifestando el interés de Uruguay y de la industria nacional de clorosoda de participar en un proyecto de mercurio del PNUMA basado en la guía de buenas prácticas industriales.

La Misión Permanente del Uruguay ante la Oficina de las Naciones Unidas y Organismos Especializados con sede en Ginebra, reitera al Programa de las Naciones Unidas para el Medio Ambiente - División Químicos, las seguridades de su más alta y distinguida consideración.



Ginebra, 15 de noviembre de 2010

Al
Programa de las Naciones Unidas
para el Medio Ambiente
División Químicos
GINEBRA



Montevideo, 9 de noviembre de 2010

UNEP Chemicals Branch, DTIE
Senior Scientific Affairs Officer
Dr. Heidelore Fiedler:

Ref. Posible proyecto de mercurio en clorosoda: Guidance on best industrial practice

En esta oportunidad me dirijo a Ud. con el motivo de expresar el interés de Uruguay y de la industria de clorosoda presente en nuestro país de realizar el proyecto de mercurio basado en la Guía de Buenas Prácticas Industriales.

Esta iniciativa del Programa de Naciones Unidas para el Medio Ambiente brinda al país y a la industria, la oportunidad de continuar el trabajo que se viene realizando sobre mercurio, sustancia sobre la cual se está elaborando tan importante negociación a nivel intergubernamental y proceso en el cual Uruguay participa activamente en la región y a nivel internacional. Por otro lado, nuestro país se beneficiará de la presencia y experiencia de expertos en el tema.

Agradecemos desde ya su consideración de la candidatura de Uruguay y quedamos a su disposición para cualquier consulta.

Saludos Cordiales,

Arq. Jorge Rucks
Director
Dirección Nacional de Medio Ambiente

Outline of plan for Eface

- Monday, 4 April 2011
 - Morning: UNEP-WCC (Consultant and Chlorosur Director)
 - Afternoon: UNEP-WCC-DINAMA: At Eface headquarters to learn to know the structure of the company and agree plan
 - Tuesday, 5 April 2011
 - Site visit at plant
 - Interviews with managers, verification of records, documents
 - Wednesday, 6 April 2011
 - Continue Wednesday activities
 - Evening: Debriefing at plant
 - Thursday, 7 April 2011
 - Mercury workshop Montevideo
 - Friday, 8 April 2011
 - Debriefing at Eface Headquarters (UNEP-WCC-DINAMA)
- ⇒ **Serve as a model for other plants and sectors**

Objectives - Outcomes

- Cooperation between private sector and government or
- Industrial NGO and Intergovernmental organization (ICCA/WCC and UNEP)
- Contribution to international negotiation process (policy and content, *e.g.*, development of guidelines, BAT)
- Agreed inspection protocol for chloralkali sector to be used in other countries (and transfer to other industries?)
- Better understanding of industrial processes and operations
- ⇒ Demonstrated process of transparency and openness between stakeholders to improve mutual understanding and communication.

Outputs for UNEP

- Agreements successfully implemented (deadline: 30 June 2011)
- Report on site-visit to Efice plant and national cooperation
- Assessment report published
- Checklist and protocols for replication elsewhere



Thank you

