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# Reporting of the mercury cell chlor alkali production partnership area (January 2009 – May 2010)

## UNEP Global Mercury Partnership

### Note by the Secretariat

Individual partnership area evaluations have been prepared by the partnership areas in response to Annex I Section 3.f.iv of the UNEP Global Mercury Partnership Overarching Framework. The mercury cell chlor alkali production partnership area has a drafted partnership area evaluation. It is available in the annex to this document for information.

# Annex: Evaluation of the Mercury cell chlor alkali production partnership area (January 2009 – May 2010)

| **1. GENERAL INFORMATION** | |
|---|---|
| **1.1 Individual partnership area:** | Mercury-cell Chloralkali Production |
| **1.2 Individual partnership area lead:** | U.S. Environmental Protection Agency<br>Martin Dieu |
| **1.3 Reporting year/period:** | 2009- May 2010 |
| **1.4 How many meetings were held over the reporting period?** | **Number of face to face meetings**: 0<br>**Number of teleconferences:**<br>3 (most recent in April 2010) |
| **1.5 How many partners are parts of this partnership area?** | Five partners have submitted official partnership letter to UNEP; approximately 16 stakeholders actively participate in teleconferences and other discussions. |
| **1.6 How much funding was raised through this partnership area? What about in-kind assistance?** | USEPA has provided $575,000 (see Section 4.0) since 2005 for project activities in this area.<br><br>Additional contributions from Russia, Canada, Norway, the World Chlorine Council are in excess of 375,000. There have also been substantial in-kind contributions provided by UNEP, India, and Mexico |

**1.7 What is the objective of the individual partnership area?**

To significantly minimize and where feasible eliminate global mercury releases to air, water, and land that may occur from chlor-alkali production facilities. Sub-objectives:

- Prevent the construction of new mercury-cell chlor-alkali production facilities
- Reduce mercury emissions and use from existing mercury-cell facilities
- Encourage conversion to non-mercury processes
- Reduce or eliminate mercury releases from waste generated by chlor-alkali production facilities including waste from conversion to non-mercury processes
- Promote environmentally-sound options for storage of surplus mercury to limit downstream releases from surplus mercury generated by the conversion, phase-out, or closure of mercury-cell chlor-alkali facilities

The partnership promotes a target of reduction in mercury demand to 250 tons by 2015 (developed in response to the first PAG meeting).

**2. MONITORING PERFORMANCE**
(tracking partnership activities and partner contributions)

**2.1 Please provide a short overview of key partnership area efforts completed since the previous Governing Council (brief description, outcomes, costs, timeframe).**

**Overview*:*** The partnership area promotes reporting and information sharing on mercury use and release reductions in the sector, and on the extent of conversions to non-mercury technologies. Conversions in the United States and Europe are continuing to take place, as is the implementation of India's voluntary program of mercury cell plant closings and conversions. Over the first years of the chlor-alkali partnership effort, the emphasis has been on: (1) sharing regional data on the status of chlor-alkali mercury cell plants, including the pace of conversion; (2) providing technical assistance, often industry-to-industry, on reducing the demand for mercury at existing plants.

The World Chlorine Council (WCC), which includes members from (USA/Canada, EU, India, Brazil/Argentina, Uruguay, Russia), continues updating performance in total mercury emission reduction and plant capacities reduction. These annual reports are posted on the UNEP Mercury website. The American Chemistry Council has also drafted an updated inventory of mercury plants around the world, now under review by partners.

**2.2 Please provide a short overview of the key current partnership area efforts (brief description, expected outcomes, budget, timeframe).**

Information material on best practices for areas such as mercury balance, reducing mercury releases, and ensuring worker saftey have been shared and posted on website (http://www.chem.unep.ch/mercury/SectorSpecific-Information/Chlor-alkali_sector(1).htm)

As noted above, the Partnership is currently assembling a comprehensive inventory of mercury-cell facilities throughout the world. This inventory is expected to help identify countries and organizations that could benefit from technical exchanges under the Partnership.

Mexico is supporting IQUISA-CYDSA on their interest to get funds to switch to membrane cells at their two plants in Mexico, and encouraged them to attend the international Hg meetings in the recent years to meet contacts and organizations useful to their purpose. They have also provided UNEP and USEPA with a summary of what their needs are, seeking orientation on the options for them to consider. Partners will seek to meet with relevant financing organizations to explore possibilities for and obstacles to financing of conversions. A representative from IQUISA-CYDSA will attend INC-1.

EPA and the Russian chlor-alkali industry have partnered to reduce mercury releases in wastewater and improve mercury monitoring systems. These on-going efforts have reduced releases to the environment by about 1 ton per year. Details of this work is as follows:

- The waste-water treatment facility at Volgograd "Caustic" will allow extracting 850-900 kg of mercury from waste water. Extracted mercury will not be returned to the surplus mercury market, but will be reused in the production cycle. (The waste-water sent for treatment contains 30 mg of mercury per liter. After the treatment process the amount of mercury in the waste is reduced to 0.0002-0.0004 mg per liter.)
- Mercury Monitoring System, MMS-16 at Volgograd "Caustic" facility, to measure mercury discharges into the air at multiple sampling points, is still undergoing the clearance process at the Russian customs. Equipment has up to 16 sampling points and will allow quick identification of mercury leaks and spillages. Use of this equipment will allow the facility to reduce mercury losses by up to 200 kg per year.
- The facility completed assembly and in the process of test-operation of two state-of-the-art electrolyzers. These new electrolyzers require minimum maintenance. Since January 2009, the facility already achieved reduction of 1.3 kg of mercury releases. The scheduled upgrade of the entire facility will allow reduction of mercury releases by 300 kg per year.
- In July 2009, the Kirovo-Chepetsky Joint Stock Company "Zavod Polimerov" began reconstruction and modernization of the brine conditioning unit. This unit is a major source of mercury losses in solid waste. Completion is scheduled for the end of 1010. When the reconstruction and modernization is completed, the facility will achieve annual reductions of 10 tons of mercury.
- Sterlitamak Caustic began implementation of their plan to reduce releases of mercury. The main activities include: stabilization of electrical current in the shop; reduction of maintenance activities which require opening of electrolyzers, use of temporary covers of electrolyzers which are under maintenance; modernization of electrolyzers. Since 2005, Sterlitamak "Caustic" facility achieved total reductions of mercury releases into the air by 212 kg and into the solid waste by 1.4 metric tons.

**2.3 Please provide a short overview of any key upcoming, planned partnership area efforts (brief description, expected outcomes, budget, timeframe).**

WCC plans to share information on elemental mercury storage experiences at the regional level. They are working on compiling conversion information based on practical experience gathered up to now. Storage information requirements in different regions will be shared. Note that EU is currently planning a revision of its waste directive to include requirements for storage of liquid mercury in salt mines (http://ec.europa.eu/environment/chemicals/mercury/index.htm) and (www.eurochlor.org/index.asp?page=819)

The Partnership will continue its information sharing efforts in the areas of technical cooperation for mercury use and release reduction and on conversions (including storage, management, and financing.) In particular, the

Partnership plans to forge greater links with the Supply and Storage Partnership Area with a view towards, among other things, facilitating access to information on environmentally sound storage options for those facilities that plan to close or convert in the future.

**2.4 Identify the priority actions for the forthcoming reporting cycle (2 years).**

See above (2.3)

## 3. TRACKING PERFORMANCE RELATED TO UNEP GOVERNING COUNCIL PRIORITIES

**3.1 In response to Governing Council Decision 25/5, paragraph 34/c:**

Please summarize the key results achieved to date by the partnership area in terms of the following areas (as applicable).

i) Providing information on best available techniques and best environmental practices and on the conversion of mercury-based processes to non-mercury based processes;

Euro Chlor, The Chlorine Institute, and the World Chlorine Council have made available information resources on industry best practices. These are posted on the UNEP mercury web page. These partners are considering sharing materials on conversions as well.

ii) Enhancing development of national inventories on mercury;

The Partnership is currently developing a comprehensive global inventory of mercury cell facilities. This inventory will help better define mercury stocks worldwide, will provide information on facilities that are not members of major regional industry groups, and will point towards areas where technical assistance may be beneficial.

iii) Raising public awareness and supporting risk communication;

USEPA gave a presentation on the chlor-alkali partnership area at the UN Commission on Sustainable Development (CSD) conference in New York in May, 2010.

Dr. Y. R. Singh of the Alkali Manufacturers' Association of India was invited by UNEP to present 'India's Voluntary Phase Out Programme' at the Technical Briefing in advance of the Intergovernmental Negotiating Committee (6 June 2010).

iv) Providing information on sound management of mercury. **See above (i)**

3.2 (a) Please specify whether the promotion of non-mercury technologies (where suitable economically feasible alternatives do not exist) is relevant to the partnership area. **Yes**

(b) If it is relevant, how is the partnership area specifically addressing the promotion of non-mercury technologies? The Partnership encourages governments and industry to convert mercury-cell chlor-alkali facilities to non-mercury technology, and to refrain from constructing new mercury-cell facilities.

## 4. ASSESSING EFFECTIVENESS

(measuring the impact of partnership activities on target beneficiaries)

**4.1 What are the partnership area indicators of progress? If no indicators, please specify why.**

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 mecury-cell technology decommissioned.

**4.2 Please report on progress in terms of each of the partnership area indicators outlined within the partnership area business plan.**

Under this partnership area, the WCC, which represents about 85% of global mercury-based chlorine production, has provided a regionally-based report on mercury consumption and emissions showing declines in mercury emissions from about 23.3 metric tons per year in 2002 to 6.4 metric tons per year in 2009 (7.4 metric tons for 2008, 8.6 metric tons for 20007). The regions covered are USA/Canada, Europe, Russia, India, Uruguay and

Brazil/Argentina. The number of MCCA plants in these regions has dropped to 58 in 2009 (85 in 2002, 70 in 2007, 60 in 2008).

**4.3 What are the strengths of the partnership area?**

This area has provided sound data on mercury cell production globally, mercury use, and mercury emissions. Additionally, it has demonstrated best practices achievable at mercury cell facilities, and has facilitated a dialog among stakeholders as the priority of future efforts. In addition, the partnership includes than 80 % of chlor-alkali industry worldwide through its industry association participation.

**4.4 What are the weaknesses and/or major challenges for this the partnership area?**

The partnership has been weakest with regards to two main challenges: (1) the difficulty in setting a specific timeline for elimination of mercury-cell process on both a national and global level, due largely to the financial cost of converting chlor-alkali plants from mercury-cell to membrane-cell technology; and (2) the difficulty posed by surplus mercury, including the question of storage, resulting from closure or conversion of mercury-cell facilities and minimizing effect of those stocks on global mercury supply. In addition, conversion rates are linked to socio-economic factors that can be difficult to address.

**4.5 Can the weaknesses or major challenges be addressed through the partnership? If yes, what is the best strategy to address such weaknesses / major challenges in moving forward?**

Yes, in cooperation with other partnership areas (e.g. supply and storage). Addressing mercury-cell plant conversion and long-term storage are especially difficult, since this will require both government and industry commitments. The partnership area is now moving on a project basis to work with particular countries and facilities on storage and surplus issues, and will work in conjunction with the UNEP effort on terminal storage in Latin America and Asia. Export bans in the U.S. and E.U., which will enter into force in the next few years, will provide further opportunities to share information and best practices on storage, while also creating impetus for industries and governments outside these areas to address their mercury trade issues. Multinational industries will likely have additional incentive to participate as their ability to send mercury to refiners and brokers is limited.

**4.6 In view of above, how should the partnership area be modifying its approach in the coming two year cycle? Should the objective and indicators of the partnership area be revised in moving forward?**

The partners believe that advances are being made but that challenges remain with regards to conversion and storage. The path forward on both these issues depends greatly on the establishment of technical and regulatory capacity within the affected countries and regions for surplus mercury management, and on financial capacities within the specific industries. The UNEP effort on storage should be of enormous help in this regard over the longer term. Partners have also expressed interest for more technical support for the conversion process, as well as assistance in seeking financing from international development banks for conversions. The Partnership is considering how it can adjust its role to address these needs.

## 5. FUTURE COLLABORATION

**5.1 Please identify whether there are potential areas of effort for the partnership that would benefit from enhanced collaboration within the overall UNEP Global Mercury Partnership.**

The partnership area believes that strengthening collaboration in the areas of mercury waste partnership area and with the supply and storage partnership area is essential.

## 6. OTHER

**6.1 Please outline how this report was drafted and who was consulted with in doing so.**

This report was drafted by USEPA as the partnership area lead. USEPA solicited input from members of the Partnership area in drafting the report.

**6.2 This section is intended for other relevant comments.**