

**MERCURY-CONTAINING PRODUCTS PARTNERSHIP AREA**  
**BUSINESS PLAN**  
**June 28, 2013**

**I. SUMMARY OF THE ISSUE**

Large amounts of mercury are used globally in the manufacture and use of numerous products and manufacturing processes at such a level that it represents almost one-third of global demand. Yet, for most products, there are effective alternatives available. The most widely known exception is in mercury-containing energy efficient lamps where mercury-free alternatives are still limited or quite expensive. Eliminating mercury in products is important because reducing the use of mercury ultimately reduces releases of mercury to the air, land or water and reduces the potential for direct human exposure. Addressing mercury use in products will reduce the global demand for mercury and help to ultimately break the cycle of mercury being transferred from one environmental medium to another. The table below illustrates that for 2005, mercury in products (e.g., lighting, measuring and control devices, dental amalgam, batteries, electrical and electronic devices, and pharmaceuticals and vaccines), and manufacturing comprised more than one-third of global demand for mercury. The 2015 “status quo” scenario is the projected demand for mercury use in products and processes, assuming that only a few measures will be introduced in the next ten years. This is considered the baseline on which the products partnership has based its 2015 “focused reduction scenario” medium term objectives.

**Table 1: Global Mercury Consumption and Projection by Sector (2005-2015)<sup>1</sup>**

Global mercury demand (metric tonnes) <sup>2</sup>	2005	“Status Quo” scenario 2015
Small-scale/artisanal gold mining	650-1,000	No change
Vinyl chloride monomer (VCM) production	715-825	1,250
Chlor-alkali production	450-550	315-385
Batteries	260-450	130-178
Dental use	300-400	270-360
Measuring and control devices	300-350	165-193
Lighting	120-150	108-135
Electrical and electronic devices	170-210	102-126
Other (paints, laboratory, pharmaceutical, cultural/traditional uses, etc.)	200-420	170-357
Total	3,165-4,355	2160-3984

Sources: Euro Chlor (available at <http://www.eurochlor.org/>); Maxson, “Mercury Flows and Safe Storage of Surplus Mercury” (August 2006); Maxson, Personal comments (December 2007); UNEP, “Summary of Supply, Trade and Demand Information on Mercury” (November 2006); “AMAP-UNEP Global Atmospheric Mercury Assessment” (2008); European Commission, “Options for reducing mercury use in products and applications, and the fate of mercury already circulating in society (2008); and UNEP, “Report on current supply of and demand for mercury, including projections considering the phase-out of primary mercury mining” (2008).

<sup>1</sup> This chart will be updated periodically to reflect relevant new data and studies on mercury demand.

<sup>2</sup> Note: “Demand” as presented above may also be termed “gross consumption,” and is here defined as total annual throughput of mercury for each of these sectors. It should be noted, however, that in each of these sectors some mercury recycling takes place, involving the recovery of mercury from products or wastes. Therefore, “net consumption” of mercury in some of these sectors (especially VCM and chlor-alkali) may be significantly lower than “gross consumption.”

The purpose of this business plan is to provide a framework and goals for developing and implementing projects aimed at the eventual elimination of mercury use in products. The business plan is to serve as a resource for providing a common, cohesive structure for implementing the United Nations Environment Program's (UNEP's) Global Partnership for Mercury's Mercury-Containing Products Partnership Area (Products Partnership). The business plan outlines quantitative goals for achieving mercury reductions in product categories, and provides information for existing and new partners as they manage and track their projects.

## II. OBJECTIVE OF THE PARTNERSHIP AREA

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.

A. In order to contribute to the overall goal of the UNEP Global Mercury Partnership, the **goal** of the Mercury-Containing Products Partnership Area is to phase out and eventually eliminate mercury in products and to eliminate releases during manufacturing and other industrial processes via environmentally sound production, transportation, storage, and disposal procedures.

### B. Medium Term (5 to 10 years) Objectives<sup>3</sup>

The following objectives represent projected reductions in mercury based on the "Focused Hg Reduction Scenario" in UNEP's November 2006 "Summary of Supply, Trade, and Demand Information on Mercury," and July 2008 "Report on Current Supply of and Demand for Mercury, including Projections Considering the Phase-out of Primary Mercury Mining."

1. In 2005, demand of mercury in batteries was roughly 260-450 tonnes. Based on a status quo scenario, demand is estimated to be around 130-178 tonnes in 2015. To track the effectiveness of the partnership, our objective is to go beyond the status quo scenario and reduce the demand for mercury in batteries (e.g., phasing out the production of mercury-containing button cell batteries), to less than 65 tonnes or a 75 percent reduction from status quo by 2015.

*Basis: Batteries – A substantial amount of the mercury now used in this sector is for button cell battery production. Thus, the pace of the transition to mercury free button cells will determine the extent of mercury demand reduction for this sector.<sup>4</sup> With U.S. manufacturers already committed to producing only mercury free button cells, the major question is when manufacturers in other parts of the globe will follow suit. Given the highly competitive nature of battery manufacturing, the likely regulatory pressures that will be placed on this sector, and the active consideration of new standards for batteries in China, one might predict that the major battery manufacturers will make*

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<sup>3</sup> Objectives are based on a "focused mercury reduction" strategy in which the key countries and companies involved identify mercury demand reduction as a clear priority, and adopt the more obvious measures necessary to move significantly toward that objective. Reference is being made to the UNEP November 2006 trade report "Summary of Supply, Trade and Demand Information on Mercury," as basis for the "focused reduction scenarios."

<sup>4</sup> As mentioned in the UNEP trade report, there remain unanswered questions with regard to batteries that are entered in the Comtrade database as "mercuric oxide batteries." The database shows world imports of more than 3,000 tonnes of these batteries for 2005, which average 65 g mercury per battery in weight. Apparently, therefore, a large number of these batteries are not button cells. Even if we assume many of these batteries may have been traded several times during the year, they comprise a potential pool of several hundred tonnes of mercury. This will not prevent us from setting a reduction target for mercury in button cells, but we should not assume that we know the extent of mercury in batteries until we know more about international trade in what are coded as "mercuric oxide batteries."

*this transition by 2015, thus reducing annual mercury consumption for this sector to less than 50 tonnes.*

2. In 2005, demand of mercury in measuring and control devices was roughly 300-350 tonnes.<sup>5</sup> Based on a status quo scenario, demand in 2015 is estimated to be around 165-193 tonnes. To track the effectiveness of the partnership, our objective is to go beyond the status quo scenario and reduce the demand for mercury in measuring and control devices to less than 120 tonnes or a 60 percent reduction from status quo by 2015.

2.a. To track the effectiveness of the partnership, our objective is to go beyond the status quo scenario and, by 2017, to phase out the demand for mercury-containing fever thermometers and sphygmomanometers by at least 70 percent and to shift the production of all mercury-containing fever thermometers and sphygmomanometers to accurate, affordable, and safer non-mercury alternatives.

*Basis: Measuring and control devices – The European Union (EU) and some states in the United States have prohibited the sale of certain mercury measuring and control devices. The most successful example of reductions in measuring devices is in the health care sector, where many experts are projecting a reduction in mercury use in this sector of 60-70 percent or more during the next ten years.*

3. In 2005, demand of mercury in electrical and electronic devices was roughly 150-350 tonnes. Based on a status quo scenario, demand in 2015 is estimated to be around 110 tonnes. To track the effectiveness of the partnership, our objective is to go beyond the status quo scenario and reduce the demand for mercury in electrical and electronic devices to less than 50 tonnes or a 55 percent reduction from status quo by 2015.

*Basis: Electrical and electronic equipment – If one assumes that the European Union Rule on Hazardous Substances (RoHS) Directive is influencing the global market, as key producers develop similar legislation over the next several years, an even greater reduction in worldwide mercury use in this sector is conceivable. However, such a reduction would depend strongly on the extent to which China eventually implements RoHS legislation.<sup>6</sup> The RoHS Directive is also starting to influence state action in the United States, where it is expected to continue to have a rippling effect.*

4. In 2005, demand of mercury in lighting and lamps was roughly 120-150 tonnes. Based on a status quo scenario, demand in 2015 is estimated to be around 108-135 tonnes. To track the effectiveness of the partnership, our objective is to go beyond the status quo scenario and reduce the demand for mercury in lighting and lamps to less than 96 tonnes or a 20 percent reduction from status quo in 2015.

*Basis: Lighting – With other countries expected to adopt legislation similar to RoHS, the mercury limits imposed by the EU could spread much more widely. In the event that a wide range of energy-*

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<sup>5</sup> CRC/NRDC research suggests a figure at the top end of this range, which would likely raise the 2015 “status quo” projection.

<sup>6</sup> China enacted RoHS-type legislation that became effective on March 1, 2007. However, the scope of the Chinese RoHS was developed entirely independent of the EU RoHS. Further, although there is substantial overlap between the European and Chinese RoHS, many product types that are not within the scope of EU RoHS are within the scope of Chinese RoHS (*see* <http://www.chinarohs.com/faq.html>).

*efficient light emitting diode (LED) or similar energy-efficient mercury-free lamps come onto the market rapidly at prices that consumers find acceptable, one could conceive of a more than 20 percent reduction in mercury use in this sector by 2015. However, there are presently no particular signs of a rapid influx of LED or other energy-efficient mercury-free lamps.*

5. In 2005, demand from dental uses was roughly 300-400 tonnes. Based on a status quo scenario, demand in 2015 is estimated to be around 270-360 tonnes. To track the effectiveness of the partnership, our objective is to go beyond the status quo scenario and reduce the demand for mercury in dental amalgam to less than 255 tonnes, or a 15 percent reduction from status quo in 2015.

*Basis: Dental uses – Even in the event of an increased number of people worldwide seeking dental care, it is possible to consider a range of incentives that may encourage a global reduction in dental mercury use during the next ten years. However, there are presently no significant trends or international initiatives reported that point in that direction. Even lacking such concerted efforts, however, it is certain that the cost of alternative dental fillings will continue to decrease, and the aesthetic advantages of non-mercury fillings will become better recognized. Further, it is recognized that certain countries are focusing on proper disposal of dental amalgam waste rather than quantitative reduction goals.*

6. In 2005, demand of mercury in other uses such as paints, laboratory, pharmaceutical, cultural/traditional uses was roughly 200-420 tonnes. Based on a status quo scenario, demand in 2015 is estimated to be around 170-357 tonnes. To track the effectiveness of the partnership, our objective is to go beyond the status quo scenario and reduce the demand for mercury in other uses to less than 150 tonnes or a 25 percent reduction from status quo in 2015.

*Basis: This sector is too diverse to predict significant reductions over 10 years. However, one might assume that the more attention is devoted to mercury awareness and reduction in other sectors, including the development and promulgation of legislation applicable to “all uses” (or similar), the more reduction of mercury in these “other uses” might also be expected.*

7. To encourage and support countries to promulgate laws, standards, and regulations that would prohibit or restrict importation of mercury-containing products.

### **III. PRIORITY ACTIONS**

1. Reduce global mercury demand related to use in products and production processes.
2. Encourage and implement use of best available technique (BAT) and best environmental practices (BEP) to reduce or eliminate mercury consumption and releases into the environment.
3. Promote substitution and support conversion to mercury-free products and production processes.
4. Develop suitable alternatives to mercury-containing products where none currently are available and promote non-mercury technologies where feasible.
5. Encourage and implement environmentally sound management of mercury waste, by

following a lifecycle management approach.

6. Increase knowledge on mercury inventories, human and environmental exposure to mercury, mercury environmental monitoring, and socio-economic impacts of mercury.
7. Improve global awareness on mercury exposure, use, production, trade, disposal, and release through exchange and dissemination of information.
8. Provide technical support to developing countries in making mercury-free products available at reasonable costs.

The Mercury-Containing Products Partnership Area will achieve its goal and objectives through structured reduction in global use and demand for mercury-containing products. It will promote substitution where feasible and promote development of alternatives where none currently are available. It also will seek to identify, reduce, and eliminate global mercury releases to air, water, or land that are associated with the manufacture and use of mercury containing products. The Products Partnership is designed to provide economic and educational benefits to partners and the general public by promoting commercially competitive and environmentally sound solutions for reducing the use of mercury-added products. It will identify where mercury is used in products and manufacturing sectors and implement effective strategies for promoting the use of feasible alternatives to mercury-added products, and tracking reductions in mercury use.

In addition, the Products Partnership seeks to identify, reduce, and eliminate multimedia global mercury releases associated with mercury-containing industrial processes and the environmentally sound collection, recycling, or disposal of mercury-added products and wastes. While such topics also will be addressed by other Partnership Areas, including the Mercury Waste Management Partnership Area, it is important to apply a lifecycle and cross-cutting approach to the effects of mercury in the production, use, and disposal of mercury-added products.

#### **IV. PARTNER EFFORTS AND TIMELINES**

The following is a list of projects that are underway or have been completed by the Products Partnership. Partnership objective(s) and priority action(s) are addressed through each project identified below.<sup>7</sup> Also identified is the stage of each specific project and a contact person from whom to get further information.

##### ***ONGOING PROJECTS***

- ***East Africa (Kenya, Tanzania, and Uganda) Dental Amalgam Phase Down Project:***  
Demonstrates dental amalgam phase down in these countries. Activities include awareness-raising on dental restorative materials, Africa dental amalgam trade study, on-site demonstration on the environmentally sound management of dental amalgam waste.
  - Partners: Ministries of Health and Environment in Kenya, Tanzania, Uganda, World Dental Federation, International Association of Dental Manufacturers, GroundWorks Friends of the Earth South Africa, WHO Oral Health Unit, UNEP Chemicals
  - Start Date: July 2012

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<sup>7</sup> Partners are encouraged to implement activities that will strategically meet the targeted objectives.

- Costs to date: \$105,000 USD (Norway ODA 2012)
  - Phase or Stage of Project: Inception workshop to take place first week of November 2012
  - Contact: Desiree Narvaez, UNEP, [desiree.narvaez@unep.org](mailto:desiree.narvaez@unep.org), Poul Erik Petersen, WHO, [petersenpe@who.int](mailto:petersenpe@who.int)
  - **Priority Actions: 1, 2, 3, 5, 7**
  - **Objective: 5 – Dental amalgam**
- ***Latin America Hospitals Project:*** Multi-year initiative to expand existing and launch new health care mercury inventory, reduction, waste management, and training pilots.
  - Partners: Brazil, Costa Rica, Ecuador, Mexico, United States, HCWH, University of Massachusetts at Lowell
  - Estimated Date of Completion: April 2013
  - Costs: \$840,000 USD (United States)
  - Contact: Ellie McCann, U.S. EPA, [mccann.ellie@epa.gov](mailto:mccann.ellie@epa.gov)
  - **Priority Actions: 1, 2, 3, 5, 7**
  - **Objective: 2 – Measuring and control devices**
- ***Phasing Down Dental Amalgam: Country Case Studies:*** Will describe several case study examples where countries have “phased down” the use of dental amalgam, including the prevalent trends, variations and commonalities.
  - Partners: Tides Center, Mercury Policy Project, WHO Oral Health Unit, UNEP Chemicals
  - Start Date: July 2012
  - Costs to date: \$20,000 USD (United States)
  - Phase or Stage of Project: The project is expected to be completed by December 2012
  - Contact: Michael Bender, Zero Mercury Working Group, [mercurypolicy@aol.com](mailto:mercurypolicy@aol.com); Desiree Narvaez, UNEP, [desiree.narvaez@unep.org](mailto:desiree.narvaez@unep.org)
  - **Priority Actions: 1, 3, 7**
  - **Objective: 5 – Dental amalgam**

## COMPLETED PROJECTS

- ***Americas Workshop to Reduce Mercury in Products:*** The North American Commission for Environmental Cooperation hosted a workshop in February 2006 in Mexico to promote the reduction of mercury use in products. The workshop informed and engaged governmental environment and health officials, non-governmental organizations, and product manufacturers in the Americas to build capacity through exchange of information on successful mercury reduction programs in various product sectors and identification of participating country needs, priorities, including next steps for reducing mercury use in products in the Americas. Meeting report available at <http://www.chem.unep.ch/Mercury/partnerships/CEC-Hg%20Prod%20Mtg%20Sum.pdf>, as well as NACEC and UNEP offices
  - Contact: Luke Trip, NACEC, [ltrip@cec.org](mailto:ltrip@cec.org)
  - Partners: Mexico, United States, NACEC, UNEP
  - Date of Completion: February 2006
  - Costs: N/A
  - **Priority Action: 7**
  - **Objective: All**

- **Basel Mercury Waste Capacity Building from Products Partnerships:** Development of a cooperative agreement that will help build capacity and best management practices for addressing mercury waste collected from health care products and other sectors addressing mercury in products.
  - Partners: Argentina, Costa Rica, Uruguay, United States, Basel Convention Secretariat
  - Date of Completion: July 2012
  - Costs: \$2,000,000 USD; year-one budget: \$250,000 USD (United States)
  - Contact: Sue Slotnick, U.S. EPA, [slotnick.sue@epa.gov](mailto:slotnick.sue@epa.gov)
  - **Priority Actions: 2, 5**
  - **Objective: All**
  
- **China Hospitals Project:** Demonstration programs at two Beijing hospitals to significantly reduced mercury containing products and waste.
  - Partners: China (Beijing), United States, Health Care Without Harm (HCWH)
  - Date of Completion: August 2007
  - Costs: \$50,000 USD (United States); RMB 500,000 (Tiantan Hospital)
  - Contact: Shen Yingwa, SEPA, [shenyw@crc-sepa.org.cn](mailto:shenyw@crc-sepa.org.cn); Chen Wen, U.S. EPA, [wen.chen@epa.gov](mailto:wen.chen@epa.gov)
  - **Priority Actions: 1, 2, 3, 7**
  - **Objective: 2 – Measuring and control devices**
  
- **Buenos Aires Hospital Project:** Supported Healthcare Without Harm's efforts to assist the Buenos Aires City Government to deliver mercury-free training for all city-run hospitals and to complete mercury elimination for two hospitals and fourteen neo-national units. Training of health workers and the procurement of mercury alternative medical devices was performed. UNEP provided technical support in the conduct of the project.
  - Partners: Buenos Aires, United States, HCWH, UNEP
  - Date of Completion: December 2007
  - Costs: \$95,000 USD (UNEP Mercury Trust Fund)
  - Contact: Josh Karliner, HCHW, [josh@hcwh.org](mailto:josh@hcwh.org)
  - **Priority Actions: 1, 2, 7**
  - **Objective: 2 – Measuring and control devices**
  
- **Burkina Faso Assessment:** Conducted an initial mercury life cycle assessment for products as a first step in Burkina Faso's efforts to characterize and reduce mercury use. A products and use inventory was developed, as well as a mercury action plan.
  - Partners: Burkina Faso, United States, UNEP
  - Date of Completion: January 2008
  - Costs: \$33,750 USD at the country level and additional support of an international consultant (UNEP Mercury Trust Fund)
  - Contact: M. Desiré Ouedraogo, [desireouedraogo@yahoo.fr](mailto:desireouedraogo@yahoo.fr)
  - **Priority Action: 6**
  - **Objective: 1 – Batteries**
  
- **Cameroon Education and Awareness for Cosmetics:** The Centre de Recherche et d'Education pour le Développement (CREPD), under the small grant funded by the Swedish Society for

Nature Conservation (SSNC), carried out activities on the identification of mercury contained in cosmetics followed by education and awareness campaign.

- Partners: Cameroon, CREPD, Swedish Society for Nature Conservation
- Date of Completion: N/A
- Costs: N/A
- Contact: Tetsopgang Samuel, Ph.D., CREPD, [tetsopganag@yahoo.com](mailto:tetsopganag@yahoo.com)
- **Priority Actions: 1, 3, 7, 8**
- **Objective: 6 – Other uses (cosmetics)**

- ***Chile Hospitals Assessment Project:*** Developed and implemented hospitals assessment and reduction/elimination of mercury-containing products in Chile.

- Partners: Chile, HCWH, United States
- Date of Completion: March 2009
- Costs: \$60,831 USD (United States)
- Contact: Thomas Groeneveld, U.S. EPA, [groeneveld.thomas@epa.gov](mailto:groeneveld.thomas@epa.gov)
- **Priority Actions: 1, 2, 3, 5, 7**
- **Objective: 2 – Measuring and control devices**

- ***Chile Inventory Development and Risk Management Planning:*** Supported the United Nations Institute for Training and Research (UNITAR), which partnered with Chile and UNEP on a project that includes awareness raising, development of national mercury inventory in Chile, including product based releases and the drafting of a Chilean mercury risk management plan.

- Partners: Chile, United States, UNEP, UNITAR
- Date of Completion: October 2008
- Costs: \$30,000 USD (UNEP Mercury Trust Fund)
- Contact: Vera Barrantes, UNITAR, [vera.barrantes@unitar.org](mailto:vera.barrantes@unitar.org)
- **Priority Actions: 6, 7**
- **Objective: All**

- ***Collection, Replacement, and Recycling of Mercury-Containing Thermometers and Safe Storage of Mercury in Altai Krai:*** This Russian Federation-U.S. bilateral model demonstration project developed model procedures to control of use and environmentally-responsible disposal of mercury-containing thermometers in the Altai Krai region of Southern Siberia. The project included the collection of mercury-containing thermometers from children's hospitals, kindergartens, orphanages, psychiatric hospitals, veterans' hospitals, and retirement homes.

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