

EPA's Roadmap for Mercury

II. Addressing Mercury Uses in Products and Processes

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OVERVIEW

Addressing uses of mercury in products and processes is a component of preventing mercury releases to air, water, or land. These releases may occur during manufacturing and industrial processes, or during the disposal or recycling of mercury-containing products and wastes. Addressing mercury use in products also reduces the demand for mercury by product manufacturers, thereby reducing demand for new mercury mining. Mercury mining still occurs in other countries and causes further releases to the global environment. Addressing demand for and use of mercury is critical to breaking the cycle of

Uses Can Contribute to Releases

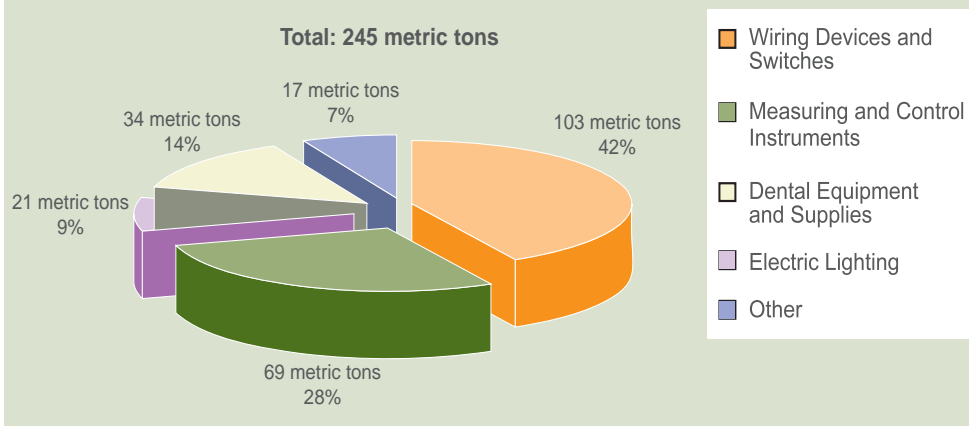
Mercury use in products can lead to mercury releases through:

- Manufacturing of product
- Spills/breakage
- Recycling/collection
- Disposal

mercury being transferred from one environmental medium to another.

EPA's long-term goal is to reduce risks associated with mercury. EPA recognizes that to reduce risks associated with mercury, the Agency must first understand what contributes to the risk and what the appropriate mechanisms of risk reduction might be. EPA will take action to identify exposed populations, minimize exposures through outreach efforts, and appropriately address anthropogenic releases. As part of its strategy, EPA will assess mercury sources of concern and will: focus on uses that would lead to risk, where cost-effective substitutes exist; promote reducing mercury in processes and products where benefits of such reduction would justify the cost, even where cost-effective substitutes do not exist; and work to identify and encourage



FIGURE 3. Total 2001 U.S. Mercury Use in Products²

development of alternatives to essential uses of mercury that lead to risk.

Sources. In 1980, the three largest U.S. industrial uses of mercury were in batteries (1,052 metric tons), the chlor-alkali manufacturing process (358 metric tons), and paint (326 metric tons).¹ Mercury use in products accounted for an estimated 245 metric tons in 2001. As Figure 3 illustrates, the dominant use of mercury in products in 2001 was in switches and wiring devices at 42 percent (103 metric tons), followed by measuring and control devices at 28 percent (69 metric tons), dental amalgam at 14 percent (34 metric tons), and electrical lighting at 9 percent (21 metric tons).

Mercury is also found in laboratories, including school science labs. Breakage or spillage of mercury supplies and mercury-containing lab equipment creates the potential for inhalation exposure to airborne mercury indoors. Mercury in schools can pose a significant exposure concern for children and adults.

In 2001, the largest use of mercury in manufacturing processes was by the chlor-alkali industry (producers of chlorine and caustic soda), estimated at 38 metric tons,

or 12 percent of overall mercury use by U.S. industry.³

Progress to date. Over the past two decades there has been a dramatic drop in mercury use by industries in the United States, decreasing 83 percent between 1980 and 1997, from 2,225 metric tons to 381 metric tons (see Figure 4).⁴ This reduction in use was due in large part to state and congressional limits placed on

mercury use in batteries, EPA's regulatory ban on mercury in paint, closure of some mercury-cell chlor-alkali manufacturing plants, and progress made under the U.S./Canada Great Lakes Binational Toxics Strategy, a voluntary agreement which set forth a goal of 50 percent reduction in the deliberate use of mercury nationwide by 2006.⁵

The lamp industry has made significant progress in reducing use of mercury. The National Electrical Manufacturers Association (NEMA) reported that its members have significantly reduced use of mercury in lamps while increasing their production of lamps. In 1990, NEMA estimates that its lamp members used 23.6 tons of mercury in slightly fewer than 500 million mercury-containing lamps. After a concerted effort to reduce mercury use, this mercury usage declined to 7 tons by 2003. In the same timeframe, sales by NEMA lamp members have increased to 650 million mercury-containing lamps. The Association of Mercury and Lamp Recyclers reports that lamp recycling has increased from fewer than 10 million lamps in 1990 to 156 million lamps in 2003.⁶

As a result of a voluntary commitment to mercury reduction made by the U.S. Chlorine Institute under the Great Lakes Binational Toxics Strategy, the chlor-alkali industry has made significant progress in reducing its mercury use since 1995. The U.S. Chlorine Institute's Ninth Annual Report to EPA showed a 91 percent reduction between 1995 and 2005 in mercury used in the U.S. production of chlorine and caustic soda, after adjusting for shut down facilities.⁷

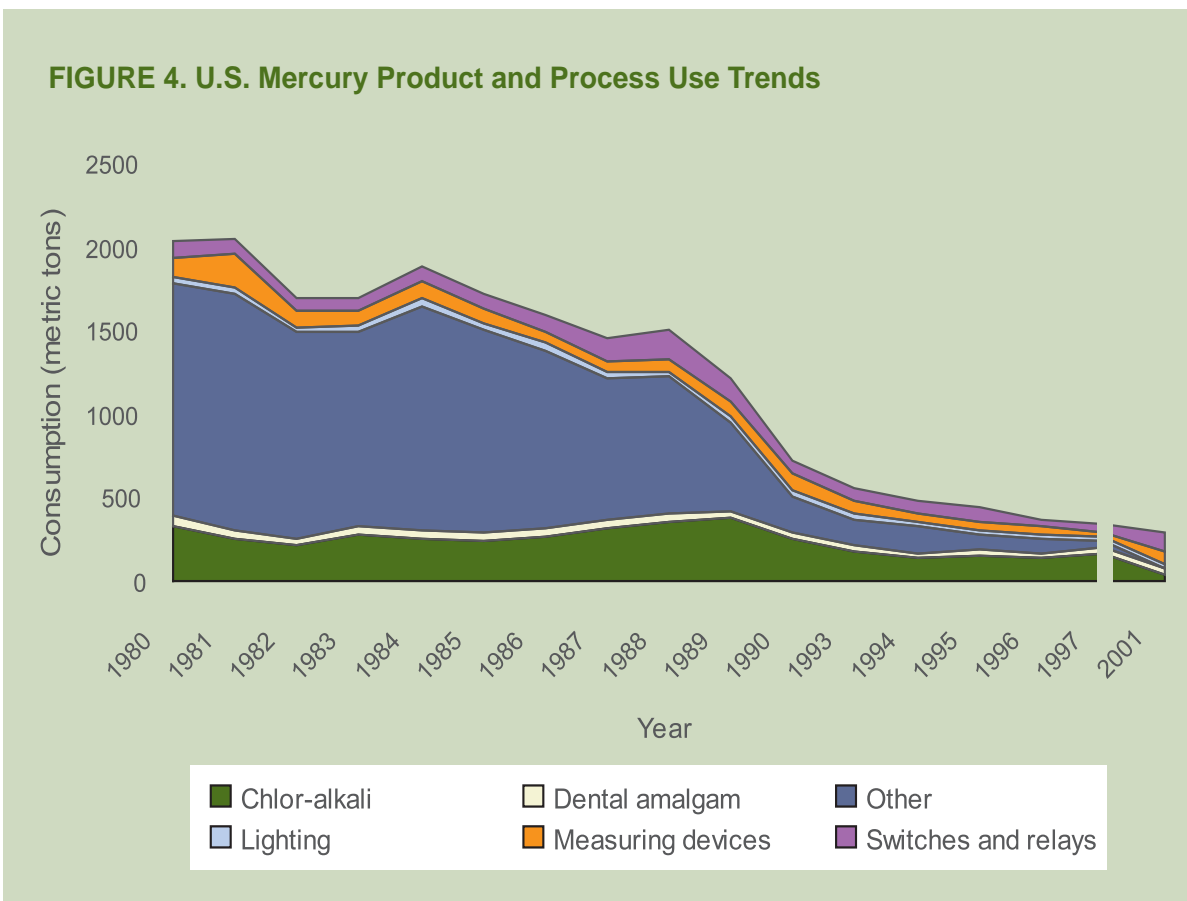
EPA's Hospitals for a Healthy Environment (H2E) program is a partnership among EPA, the American Hospital Association (AHA), the American Nurses Association, and Health Care Without Harm to encourage hospitals to eliminate the use and purchase of mercury-containing products such as measurement and control devices.⁸ Under H2E, these health

care facilities have pledged to eliminate mercury use and waste whenever possible by 2005 and to reduce all types of waste by 2010.

State, Tribal, and Local Government Use Reduction Efforts

Many state, tribal, and local governments have been leaders in reducing mercury use. States have developed innovative mercury use and release reduction laws and regulations that supplement, and in some cases provide a model for, national efforts. For example, all of the New England states have adopted legislation to reduce mercury use in products.⁹

States, tribes, and local governments have played a key role in outreach to the business community and to the general public about the importance of properly disposing of mercury-containing products and



about alternatives to such products. Many states and local governments have sponsored mercury collection/replacement programs for businesses and households for products such as mercury thermometers. They have also made special efforts to educate and encourage hospitals and schools to eliminate the use of mercury and mercury-containing products. For example, over the past few years, the northeast states, in conjunction with the eastern Canadian provinces, have collected over 2,000 pounds of mercury from cleanout efforts at over 200 schools.¹⁰ These efforts have been key to the progress made to date on reducing mercury use in school science laboratories.

Likewise, several states such as Maine, Texas, and localities such as Alameda County, California have built green purchasing requirements that specify the use of non-mercury alternatives into their state procurement systems.

Future focus. During the next ten years, EPA will focus on uses that would lead to risk, where cost-effective substitutes exist; promote reducing mercury in processes and products where benefits of such reductions would justify the costs, even where cost-effective substitutes do not exist; and work to identify and encourage development of alternatives to essential uses of mercury that lead to risk by working with state and tribal partners, industry, and non-governmental organizations. The Agency's use reduction activities will be conducted in the context of the global market for commodity-grade elemental mercury and the need for global use reductions. (See Section III for further discussion of the mercury commodity market.) EPA will continue to support and build on successful state and local efforts by funding selected mercury projects, provid-

ing information about mercury sources and reduction opportunities, and coordinating joint efforts to further progress on addressing mercury use. EPA will also continue to work with other countries and international organizations to address global demand for and use of mercury as discussed further in Section V on international mercury sources.

Need for a National Mercury Use Database

Reliable and publicly available data on mercury use is a prerequisite to gauging the success of EPA initiatives to reduce the use of mercury. In 1998 the U.S. Geological Survey discontinued its annual reporting of mercury use, due to low voluntary response from mercury-using manufacturers. More recently, other limited sources of mercury use information have emerged: (1) the U.S. Chlorine Institute's annual report to EPA on mercury usage by the chlor-alkali industry;¹¹ and (2) the Northeast Waste Management Officials' Association's (NEWMOA) database on mercury-containing products, housed in NEWMOA's Interstate Mercury Education and Reduction Clearinghouse (IMERC).¹² The IMERC database contains annual data (beginning with 2001) required from manufacturers by the states of Connecticut, Maine, New Hampshire, and Rhode Island on national sales of specific mercury-containing products that are sold in these four states. The IMERC database is updated every three years. The base year for data is 2001; companies are required to report on 2004 data in 2005. EPA is evaluating how best to build upon this information as it is developing its database for mercury use in products and processes nationwide. A national use database will enable EPA and its partners to evaluate the effectiveness of its outreach activities.

Priority Activities for Reducing Mercury Uses

To further progress in reducing risks associated with mercury use, EPA will continue to pursue a number of priority activities. These activities are based on considerations of the quantity of mercury used by specific industry categories; opportunities to provide national leadership; and opportunities to work in partnership with industries, other federal agencies, state, tribal and local governments, other institutions, and public interest groups.

Industrial Processes

- **Track Reductions by Mercury-Cell Chlor-Alkali Facilities** – EPA will continue to monitor the use of mercury by the chlor-alkali industry through the EPA/U.S. Chlorine Institute voluntary agreement on use reporting for the remaining U.S. mercury-cell chlor-alkali plants.
Timeline: Ongoing through 2006

Mercury-Containing Products

- **Further Reduce Risks Associated with Mercury Use Using TSCA Authorities and Voluntary Mechanisms** – EPA will focus its new reduction efforts on switches, relays, and measuring devices because these sectors represent the majority of mercury use in products, and cost-effective alternatives are available for many uses in these categories. EPA will conduct a preliminary market analysis of mercury switches, relays, and measurement devices to identify candidate product manufacturers to partner with the Agency to reduce mercury use. Building upon successful state regulatory programs, EPA will pursue further use reductions in this product area using TSCA and voluntary mechanisms.

Timeline: Proposed auto switch significant new use rule in 2006

- **Develop Database to Track Reductions in Mercury Use by Key Sectors** – EPA is compiling and assessing information on mercury use and substitutes from existing data sources. The Agency will explore using various mechanisms to improve the comprehensiveness and reliability of its national database on mercury use, supply, and substitutes. This information also will allow EPA to evaluate the effectiveness of its outreach activities on mercury-containing products. Timeline: Data collection is ongoing; database in 2007
- **Promote Procurement of Non-Mercury Products by Federal Agencies** – EPA is compiling a list of alternative non-mercury products with a special emphasis on those that contain non-mercury switches, relays, and measuring devices. EPA will compile and convey information—such as federal, state, and local bid specifications—to federal purchasers using its Environmentally Preferable Products (EPP) Database.¹³ The intent is to harness the large federal buying power to increase demand for non-mercury products. EPA will also make such information available to other interested purchasers, including state, tribal, and local governments; large industrial purchasers currently using mercury switches and relays (such as manufacturers of cars, airplanes, and appliances); institutional purchasers such as hospitals and schools; and individual consumers. Timeline: Ongoing
- **Partner with Automobile Manufacturers to Eliminate Mercury** – EPA will work with the auto manufacturers on

additional mercury use reduction and elimination of mercury from products, such as high-intensity discharge (HID) headlights. EPA will provide auto manufacturers with information on non-mercury alternatives to auto components through its Green Suppliers Network, an EPA partnership effort with manufacturers and their supply chains.¹⁴ **Timeline: Enhance partnership efforts on auto products in 2006**

- **Reduce Mercury in Health Care Facilities** – EPA will continue partnerships with the American Hospital Association (AHA), the American Nurses Association, and Health Care Without Harm to encourage hospitals to eliminate the purchase of mercury-containing products such as measurement and control devices, and properly dispose of mercury-containing products currently in health care facilities. EPA will expand these efforts by recruiting additional facilities. **Timeline: Recruit 2,000 new facilities by 2007**
- **Promote Mercury Reduction in Schools** – Building upon the successful work of the mercury-in-schools projects throughout the country by states and EPA regions, EPA will continue to work with school administrators and policy makers to promote the substitution of mercury with environmentally preferable chemicals through procurement policy guidelines and the use of green chemistry; the removal of elemental mercury, mercury reagents, and mercury waste products from school laboratories; the replacement of mercury-containing devices with safer non-mercury-containing devices in all school facilities; and the use of software to educate school maintenance workers and decisionmakers about potential environmental hazards in schools and ways to reduce them. EPA is developing a handbook, “Chemical Management for Schools: Recommended Actions for Administrators,” which will help schools safely manage chemicals, including mercury. This guidance will help school officials ensure the health and safety of the students and school employees. **Timeline: Finalize Chemicals Management Document in 2006**
- **Schools Chemical Cleanout Campaign (SC3)** – Existing stocks of outdated, unknown, excessive or unnecessarily hazardous chemicals—are present in schools across the country. These chemicals can pose safety and health risks to students and staff, and a number of widely reported incidents involving such chemicals have resulted in school closures and costly clean-ups. To reduce the number of these incidents, the Agency has initiated the Schools Chemical Cleanout Campaign (SC3)¹⁵ which promotes removal of existing stocks of hazardous chemicals from secondary schools; safe chemical management; and national awareness. The ultimate goal of the SC3 is to create a chemically safer school environment in which chemicals are purchased wisely, stored safely, handled by trained personnel, used responsibly, and disposed of properly. In the summer of 2004, EPA launched ten SC3 pilots, one in each EPA region. EPA provided funding for an additional eight pilots in 2005. Outreach materials are now available on the website at www.epa.gov/sc3. **Timeline: Ongoing**
- **Promote Mercury Product Use Reduction Partnerships** – Many current

mercury uses in products have cost-effective, mercury-free alternatives. EPA is currently inviting companies to voluntarily commit to mercury product use reduction and phaseout goals and to become partners in EPA's National Partnership for Environmental Priorities (NPEP) Program. As a component of these partnerships, EPA is promoting mercury-containing product take-back/recycling programs and providing technical assistance to industry in achieving their NPEP goals. **Timeline: Ongoing**

- ***Promote the Mercury Challenge*** – EPA is currently inviting companies to commit to establish inventories of mercury; remove mercury and mercury-containing equipment from their plants; and institute purchasing policies to reduce mercury use. This mercury challenge is a component of the NPEP program.¹⁶