

Global Control of Mercury Emissions

Presentation to NEWMOA Mercury
Science and Policy Conference

Marianne Bailey

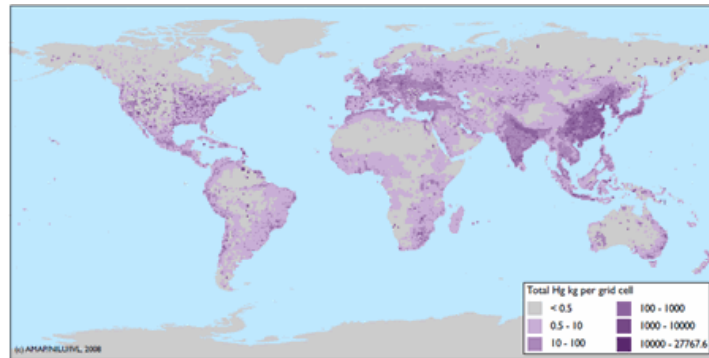
EPA Office of International Affairs

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Focus of the Presentation:

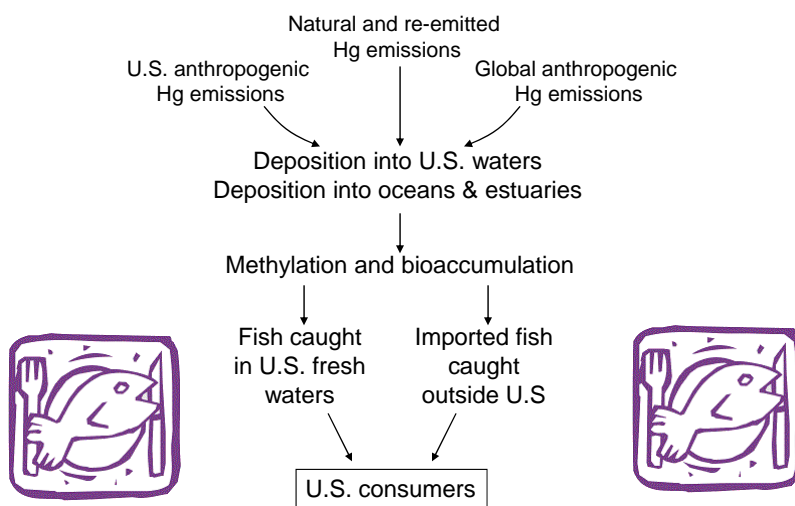
1. Global Mercury Emissions Sources
2. Impacts to the United States from Global Mercury Emissions Sources
 - transport and deposition, fresh water and marine sources, exposures
3. Global Efforts to Address These Sources
 - UNEP Study of Major Emissions Sources
 - Immediate Actions Called for by UNEP Governing Council
 - UNEP Global Mercury Partnership

Global Anthropogenic Mercury Emissions



Source: United Nations Environment Programme Global Atmospheric Mercury Assessment: Sources, Emissions and Transport, 2008, **using 2005 data**, as presented by the Arctic Monitoring and Assessment Programme Secretariat

Mercury Exposure Pathways from Emissions Sources to U.S. Consumers



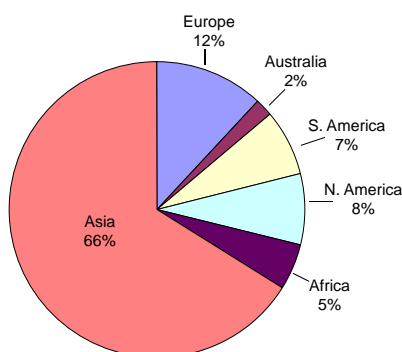
What does this mean for U.S. exposures?

US exposures primarily from fish consumption

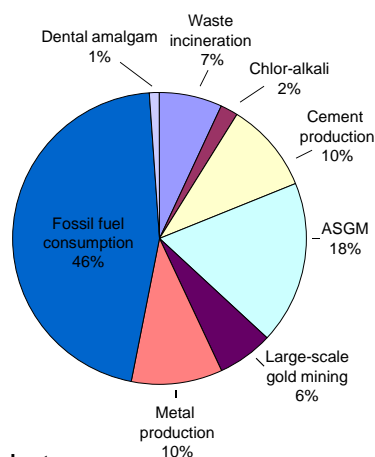
- **Most commercial fish consumed by Americans (over 90%) is from oceans and estuaries.**
 - Oceans and estuaries affected by deposition and methylation
 - Implications of current rates of deposition
- **Freshwater fish are a large part of the diet of some U.S. populations**
 - USGS August 2009 study: mercury in every fish sampled ; 27% of freshwater streams exceed EPA mercury criterion
 - EPA Fish Study 2009: about 50% of U.S. freshwater lakes exceed EPA mercury criterion
 - Over 3000 fish advisories in all 50 states for mercury
 - Challenges for state regulators

Global Anthropogenic Emission of Mercury

By Region (2005)

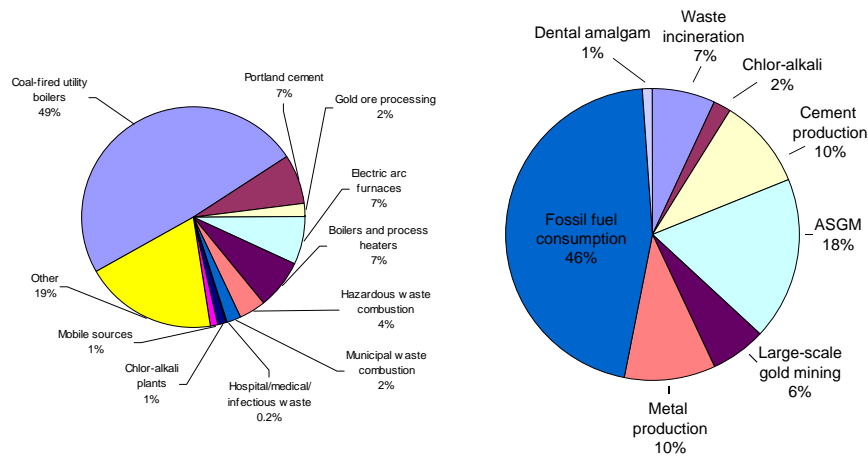


By Industry (2005)



Total = 1930 metric tons
(UNEP, 2008)

U.S. vs. Global Anthropogenic Emissions of Mercury (By industry, 2005)



U.S. Total = 96 metric tons

as supplied by Anne Pope, OAQPS on 9/30/09

Global Total = 1930 metric tons

UNEP, 2008

Global Efforts to Address Mercury

- 2002 UNEP Global Mercury Assessment identified state of science, global nature of problem, significant contributors, and reduction initiatives. UNEP initiated Mercury Program in 2003.
- December 2003, Long-Range Transboundary Air Pollution (LRTAP) Convention Heavy Metals Protocol entered into force.
- 2005 UNEP Governing Council called for partnerships as one approach. The U.S. initiated partnership work in five areas.
- UNEP 2008 Mercury Working Group agreed on policy framework for future mercury action.
- **February 2009 UNEP Governing Council agreed to begin negotiations on legally-binding mercury instrument.**

GC Decision: Additional Elements

- UNEP to conduct “Para 29 Study” of current and future trends of mercury emissions sources, analysing and assessing the costs and the effectiveness of alternative control technologies and measures.
- Focus is on most significant “unintentional” emissions sources – those sources which do not use mercury as an input but which emit mercury: Coal combustion, cement kilns, industrial metals production, and waste combustion
- Source inventories and extent of current emissions controls
- Control options and indications of costs
- Study is expected to focus on key mercury-emitting countries/regions which give a regionally-balanced picture:
 - China, India, Russia, South Africa, Brazil, U.S., EU
 - Current data limitations prevent clear determinations of many countries’ overall emissions levels

GC Decision: Additional Elements

- Immediate Actions
 - Enhance capacity for mercury storage
 - Reduce supply (e.g. primary mercury mining)
 - Reduce use in artisanal gold mining
 - Reduce use in products and processes
 - Provide information on BAT/BEP and conversions
 - Enhance development of national inventories
 - Raise public awareness, support risk communication
 - Provide information on sound management of mercury

UNEP Global Mercury Partnership

- Launched in 2005
- Widely accepted as an important component of a global mercury control regime
- Overarching framework, with goals, objectives, and business plans, put in place in 2008
- Partnership Areas:
 - Coal Combustion
 - Products
 - Chlor-alkali
 - Artisanal Gold Mining
 - Supply and Storage
 - Fate and Transport Research
 - Waste
 - Non-ferrous Metals
 - Vinyl Chloride Monomer

Examples of Partnership Work: Air Transport and Fate Research

- Led by Italy
- “Mercury Fate and Transport in the Global Atmosphere,”
 - comprehensive report to UNEP in 2008 on global emissions, air monitoring and air modeling, involving 70 scientists from 12 different countries. Critical input to UNEP 2008 emissions report.
- Speciated mercury measurements supported by USEPA at NOAA’s Mauna Loa High Altitude Monitoring Station
 - better understand transformation and fate;
 - investigate oxidation of elemental mercury to RGM in the marine free troposphere;
 - support long-term record of various mercury species;
 - evaluate formation mechanisms of particulate mercury;
 - support understanding of global baseline.

Coal Combustion

- Largest Emissions Sector Globally
- Led by International Energy Agency
- Best Practice Options for Coal Fired Power Plants
- Economics of Mercury Control
- Sorbents research at Russian coal-fired power station
- Mercury control optimization demonstration project in Russia, China, South Africa, and India

Artisanal Gold Mining

- Responsible for emissions of about 400 tons per year globally
- Involves 10 million miners, 3 million women and children, over 70 countries, and produces at least 12% of the world's gold @ about \$10 billion per year
- Led by UNIDO and NRDC
- Solutions: technical, market-based, policy
 - retorts
 - mercury capture systems for gold processing
 - national and regional action plans



Mercury Supply and Storage

- Kyrgyzstan Primary Mercury Mining
 - Mercury now mined in only two countries in significant quantities; China for internal use
 - Government of Kyrgyzstan has recognized the importance of ceasing primary mercury mining, but faces economic challenges
 - Next Steps: remediation, small-scale development, large scale pre-feasibility work
- Asia and Latin America Storage Projects
 - Result of UNEP Governing Council (GC) decision 23/9 to explore options for long term safe and secure management of mercury
 - the GC has established mercury supply reduction as a global priority, and urged governments “to gather information on the options and solutions for the long-term storage of mercury”
 - Projects are underway in Asia and Latin America



Additional Partnership Area Projects:

- VCM
- Chloralkali
- Products
- Metals

Thank You!

For more information:

Bailey.marianne@epa.gov
www.chem.unep.ch/mercury