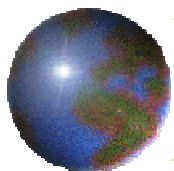


Overview of OIA PBT/POPs Program



Chicago, December 1, 2004

*Angela Bandemehr, Deputy Toxics Team Leader
U.S. EPA Office of International Affairs*



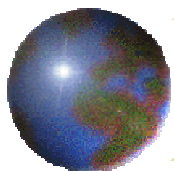
OIA PBT/POPs Program

- Term of Reference: EPA Strategic Plan, 2003-2008
 - <http://www.epa.gov/ocfo/plan/plan.htm>
- Pollutant Focus:
 - Mercury
 - Emerging Chemicals – Lindane and brominated flame retardants
 - Stockholm Convention Persistent Organic Pollutants: PCBs, Dioxins/Furans, POPs Pesticides, www.pops.int

Country/Regional Focus

China, India, Russia, Africa

Wider Caribbean Basin/Central America



Outline: Office of International Affairs PBT/POPs Projects 2003-2008

☒ **POPs/PBT Pesticides**

- ▶ Russia
- China
- ▶ Africa
- ▶ India

☒ **PCBs**

- ▶ Russia
- China
- ▶ Wider Caribbean/Central America

☒ **Dioxins/Furans**

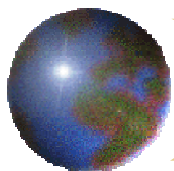
- Russia
- ▶ China

☒ **BFRs**

- Arctic Countries

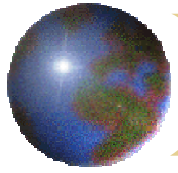
☒ **Mercury**

- Russia
- China
- India
- Global

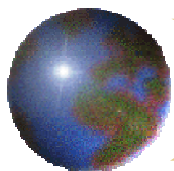


*Outline: Office of International Affairs
PBT/POPs Projects 2003-2008*

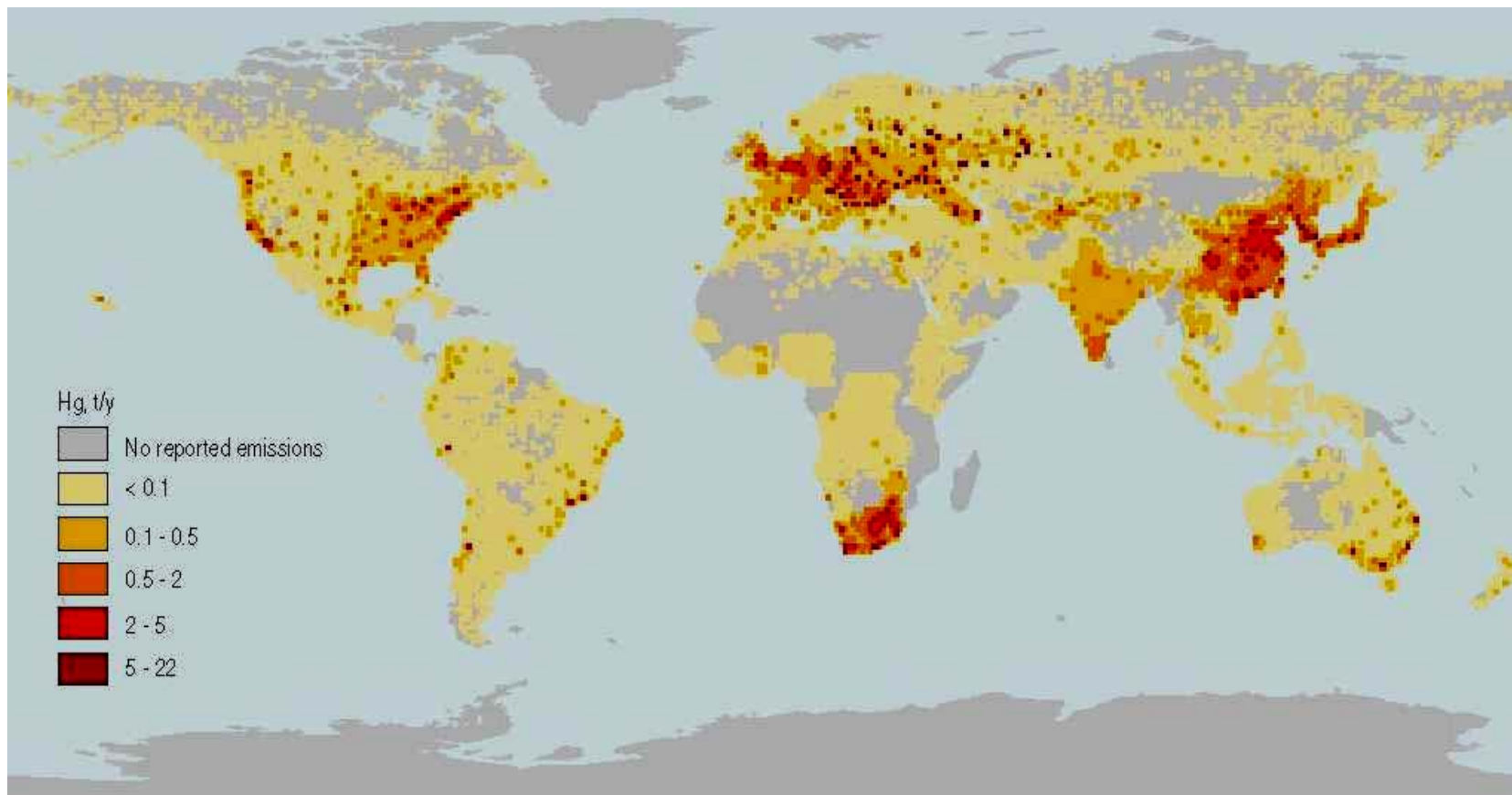
- ✚ **International Outreach and Cooperation with UNEP Chemicals** to support a **World Bank** effort to develop documentation and training for donors on the link between poverty reduction and the sound management of toxics
- ✚ **Chemical Information Exchange Network (CIEN)** www.epa.gov/cien
- ✚ **Information Exchange for the Sound Management of Chemicals (INFOCAP)** www.infocap.info

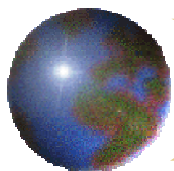


Mercury Projects

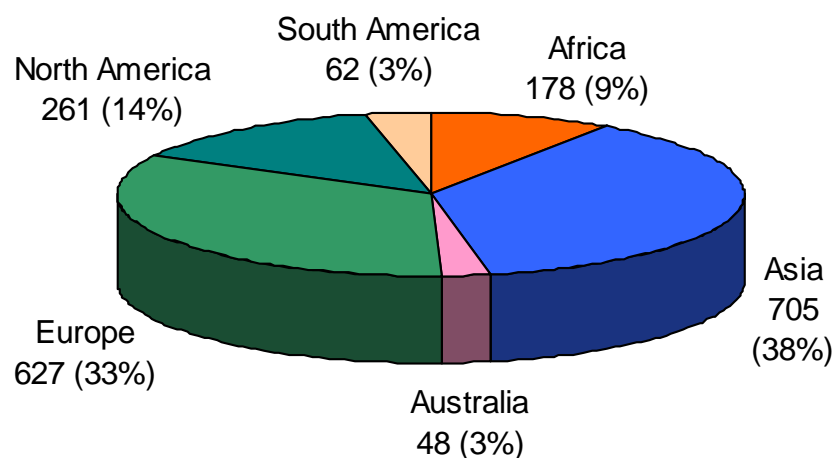


Spatial Distribution of Global Emissions of Mercury to Air

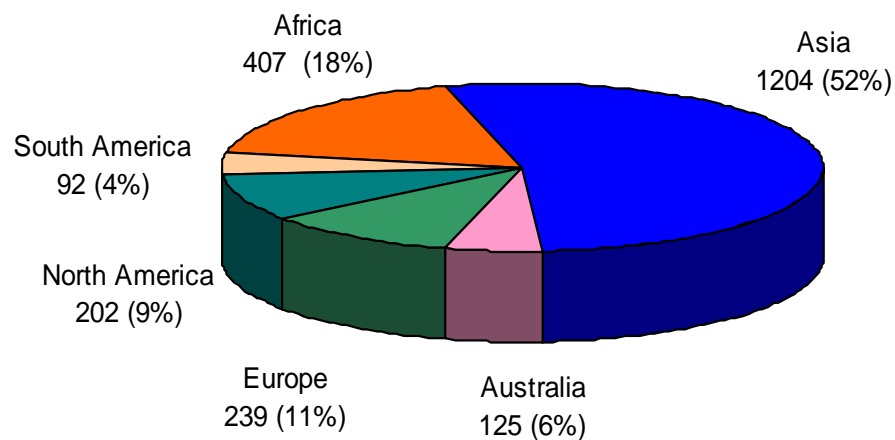




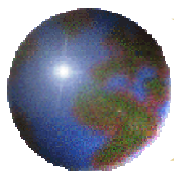
Annual Anthropogenic Emissions of Mercury Worldwide (Metric tonnes/yr)



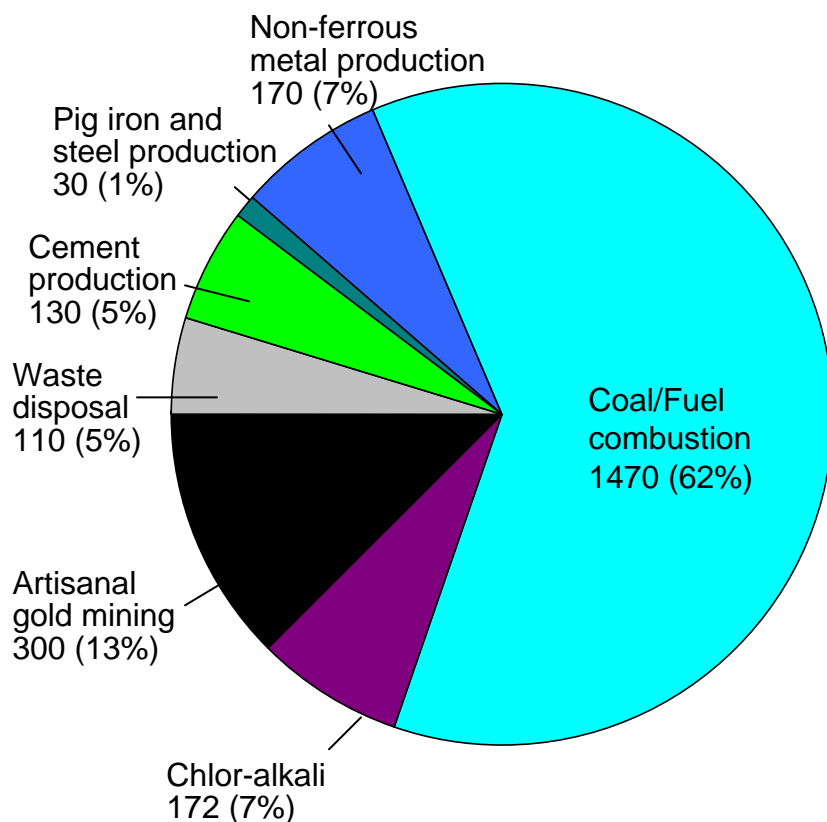
1990
Total: 1881



2000
Total: 2269

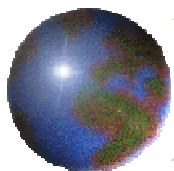


Anthropogenic Air Emissions of Mercury: Distribution by Industrial Sector in 1995

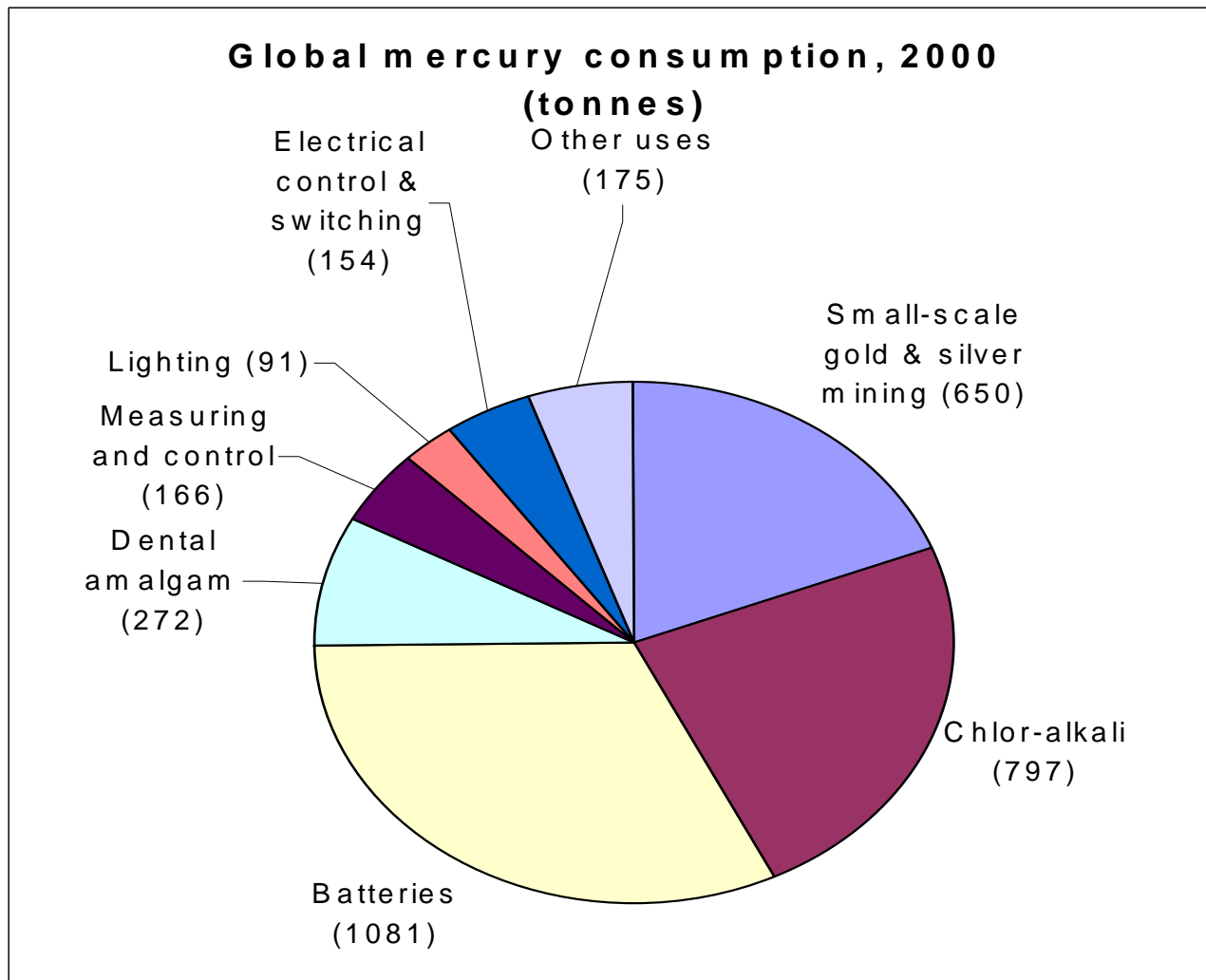


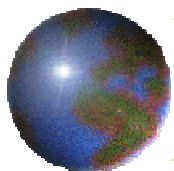
Total: 2,382 metric tons

- Coal and fuel combustion is by far the largest source category
- Estimates are rough; most countries do not have Hg inventories
- We need to further develop reliable emissions inventories



Global Mercury Consumption, 2000





Mercury Projects

	<i>Russia</i>	<i>India</i>	<i>China</i>	<i>Global</i>
<i>Characterizing Transport Pathways</i>	<i>Emissions inventory completed for Russia and Arctic Region</i>	<i>Training, tech transfer on emissions testing from power sector</i>	<i>Development of situational assessment; ambient monitoring from power sector</i>	<i>Mauna Loa High-Altitude</i>
<i>Inventories</i>	<i>ACAP power sector technology demonstration under development</i>			<i>Assist UNEP in capacity building for inventory development</i>
<i>Emissions and Use Reduction</i>				

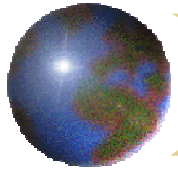
NOTES: Other recent funded and unfunded activities:

UNEP diplomatic and technical work

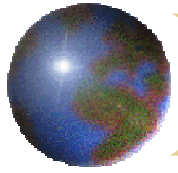
Monitoring, modeling and health work

UNIDO artisanal mining work

Cord blood study



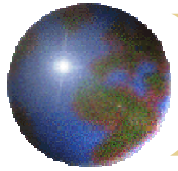
POPs Projects



Arctic Council Action Plan:

Environmentally-safe Management of Obsolete and Prohibited Pesticides in the Russian Federation

The EPA Strategic Plan, Objective 4.1 states: “By 2008, reduce by 20 percent the inventories of obsolete persistent organic pesticides from the key source countries of Russia and Mexico.”

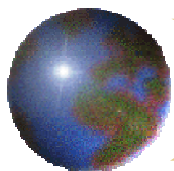


Arctic Council Action Plan:

Environmentally-safe Management of Obsolete and Prohibited Pesticides in the Russian Federation

Objectives:

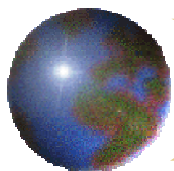
- ❊ Develop an inventory in the regions of Russia impacting the Arctic
 - ❖ Characterize the pesticides (screening analysis)
 - ❖ Stabilize pesticides currently stored in unsafe conditions
- ❊ Design a collection and storage system in preparation for ultimate destruction of the pesticides stocks
 - ❖ Design and construct a prototype modular storage facility
- ❊ Pilot Demonstration Program
 - ❖ Destroy **100 Tonnes** of obsolete and prohibited pesticides



Obsolete Pesticide Storage:

Beresnick District Arkhangelsk Region, 13 May 2003

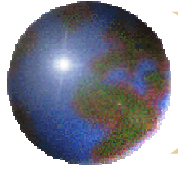




Repackaged and Labeled Obsolete Pesticides:

*Stored and awaiting destruction, Beresnick District
Arkhangelsk Region, Summer 2004*

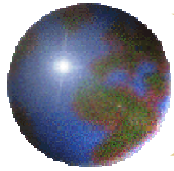




Africa Stockpiles Program

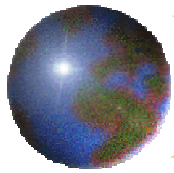
Objectives:

- ❖ Mali risk reduction pilot project
 - ❑ Prevention, inventory, disposal
 - ❑ Huge opportunity: Locust situation: stockpile prevention and container management
- ❖ Best practices guidelines
 - ❑ Pollution prevention, container management, poisoning prevention
- ❖ **Partners:** *FAO, USGS*, GEF, World Bank, WWF, UNEP, CropLife International, and participating countries



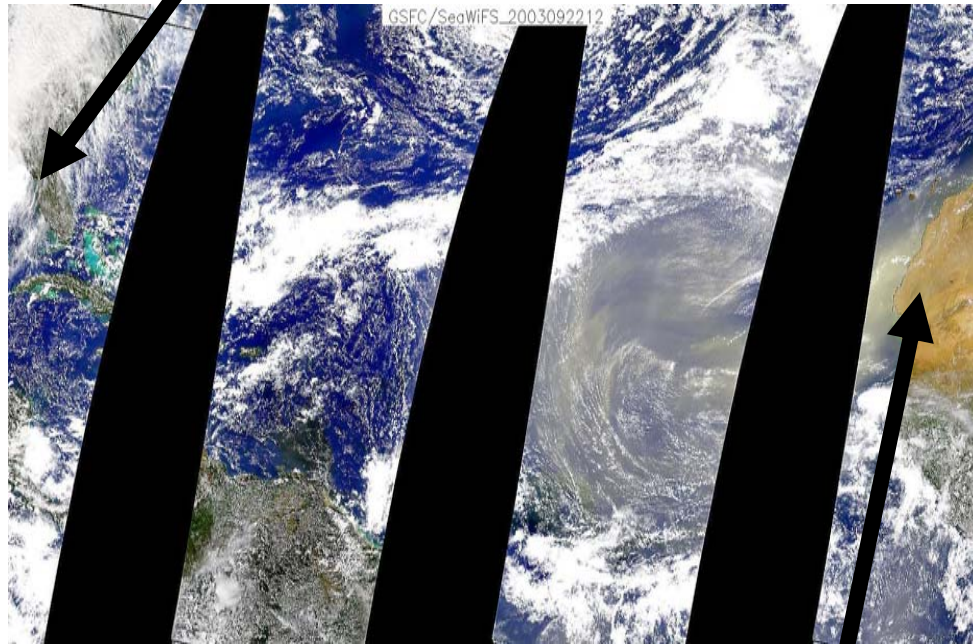
Leveraging

- Mali work leverages \$617K from Bank
 - Initial assessment
 - Operational manuals, work plans, procurement plans
 - Next will be contractor /expert field work
 - Disposal, probably some remediation
 - Prevention
- Results will be transferred to other Phase I countries: Ethiopia, Morocco, Nigeria, South Africa, Tanzania, Tunisia
- Best practices will be transferred throughout ASP program and beyond
- Total ASP tonnage inventoried so far: 50,000 tons

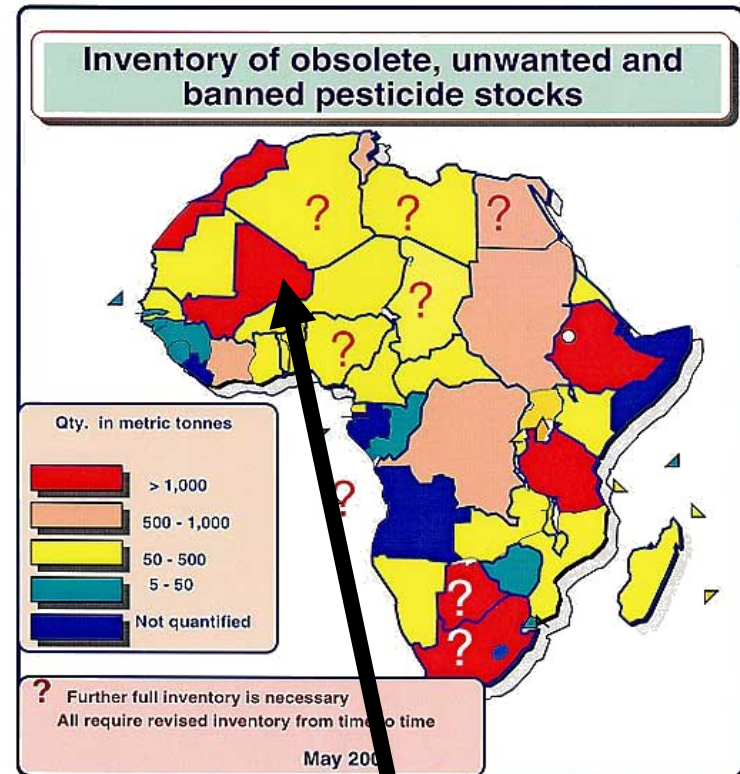


Air Toxics Transport from Africa

Florida

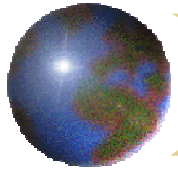


West African Coast



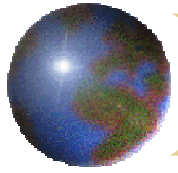
Mali

Africa



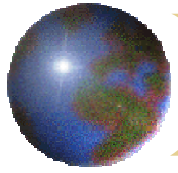
India Stockpiles Program

- ✿ Primary focus of EPA cooperation with India on Stockholm Implementation is POPs pesticides, as part of MOU between EPA and the Indian Ministry of Environment and Forests.
- ✿ Stockholm Convention on POPs “Status Report and Needs Assessment” for India notes:
 - ✿ FAO report on obsolete stockpiles in India at 3,346 tons (but estimates real figure much higher)
 - ✿ “There are no policies or technical guidelines in India regarding disposal of stockpile”



India Stockpiles Project

- ❖ Supported training in India on conducting inventories of banned and obsolete pesticides, to be followed by inventory demo in one State
- ❖ Partners are UN Food and Agricultural Organization, the Indian Ministries of Environment and Agriculture, Indian Tech Orgs (e.g., Industrial Toxicology Research Centre)
- ❖ OPP providing trainers, USAEP providing travel funding.
- ❖ Short-term Objective: trained cadre in India to conduct inventory and demo in one State.
- ❖ Long term: improved inventory, stockpiles policies and guidance in place, and demo of destruction of stockpiles



Arctic Council Action Plan (ACAP) Phase-out of the PCBs in the Russian Federation

The EPA Strategic Plan, Objective 4.1 states: “By 2008, reduce by 20 percent the inventories of PCBs in Russia that have the greatest potential for contributing to the long-range environmental transport of these pollutants to the United States”

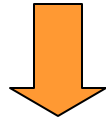
Map of Eastern Russia



Phase-Out of PCB Use and Management of PCB Contaminated Wastes in Russia

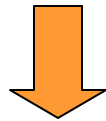
Completed

Phase 1: Development of inventory of PCBs



Completed

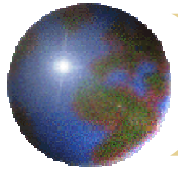
Phase 2: Nine proposed projects outlined



Phase 3: Four demonstration projects are underway:

- **Cleaning of transformers**
- **Destruction of liquid PCBs from transformers**
- **Destruction of PCB-containing capacitors**
- **Development of collection and storage strategy for transformers**

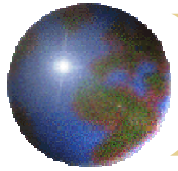




Arctic Council Action Plan (ACAP):

Phase-out of the PCBs in the Russian Federation

- ✚ **Phase 3: Demonstration of Destruction of Russian Capacitors Containing PCBs**
 - ❏ Objective: To provide the Russian Federation with the capacity to destroy PCB-containing capacitors and pesticides designated in the Stockholm Convention
 - ❏ Problem: No more than 50% of the PCBs in the capacitors can be drained, therefore the entire PCB-containing capacitor and contents must be destroyed
 - ❏ ACAP Demonstration Project: To destroy 12,000 capacitors containing approximately 200 tonnes of PCBs
 - ❏ Technology Selected: Plasma arc centrifugal treatment system

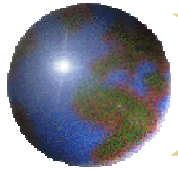


Arctic Council Action Plan (ACAP):

Phase-out of the PCBs in the Russian Federation

- ✿ **Partners:** Canada, Denmark, Finland, Iceland, Netherlands, Norway, Russia, Sweden, United States

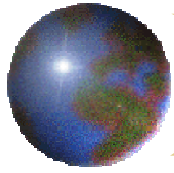
- ✿ **Leveraging:**
 - The US has contributed an \$8M Plasma Arc Thermal Destruction System.
 - Donor countries have committed funds
 - Russia will provide an in-kind contribution in excess of \$1.5M (transportation of the system from the U.S. to Russia, construction of the building and infrastructure to house the system)



Arctic Council Action Plan (ACAP):

Phase-out of the PCBs in the Russian Federation

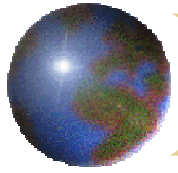
- ✚ Estimated cost for Phase 3 Demonstration Program is \$2.0-2.5M
- ✚ Russian delegation visited US Plasma arc facility- September 2004
- ✚ Shipment of System to Russia is scheduled for December 2004
- ✚ Assemble and test the system –1 yr
- ✚ Pilot demonstration- Completion in 2007



PCB Management in the Wider Caribbean Region

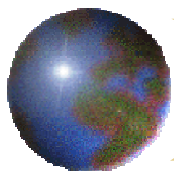


Wider Caribbean



PCB Management Model in the Wider Caribbean Region

- **Objective:** Develop model to reduce sources of PCBs in this Region
- Problem is utility-driven -- Utilities own most electric equipment
- Electrical transformers are 95% of problem
 - 20-40 year service life ending
 - Leaking in storage and operation
 - Large number decommissioned per year (125)
- Why start in Bahamas?
 - Proximity to U.S.
 - Signatory to Stockholm Convention
 - Good model for region
 - Proactive private utility (Grand Bahamas Power Co.)



Inventory Results

- ⊕ Inventoried about 10% of in-use equipment on 3 major islands (Grand Bahama, New Providence, Paradise)
- ⊕ 34% (about 40 pieces of equipment) of inventoried equipment > 50 ppm PCBs -- above US action level for treatment
- ⊕ 330,000 gal of oil or 110 lbs of PCBs
- ⊕ Most located in transformers

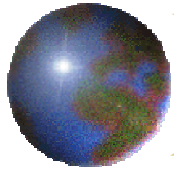
Existing Storage Facility



Exposed waste bins

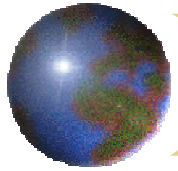


Covers for PCB drums, but no drums



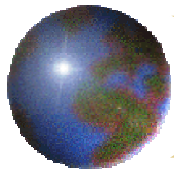
Grand Bahamas Power Company Model

- Build PCB storage facility
- Treat PCB contaminated oil in transformers
 - Oil is recycled
 - Chemical destruction of PCBs
 - Wastewater is treated and discharged on site
- Shipment of materials for destruction in France
 - Transformers containing pure PCBs (>500ppm)
 - Drums of PCB-contaminated soil
 - Other PCB contaminated materials (protective clothing)
- Shipment of cleaned transformer carcasses to China/Venezuela for recycling



PCB Management Model for Caribbean

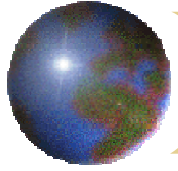
- National PCB Assessment – scope of problem, usually part of the national implementation plan
- Outreach and Education – identify stakeholders
- Institutional strengthening for regulatory programs – strengthen legal regimes for PCB management
- Conduct PCB elimination activities
 - ▶ Develop implementation plan for targeted pilot project
 - ▶ Evaluate appropriate technologies: e.g., on-site chemical dechlorination, shipping for destruction
 - ▶ Select PCB management approach
 - ▶ Implement PCB management approach
- Develop case study – share lessons learned



Next Steps

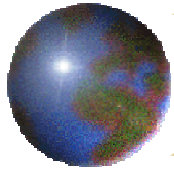


Wider Caribbean



China Cooperation: MOU with SEPA

- ❖ **Managing Unintentional Releases of dioxins/furans from Cement Kilns**
- ❖ **Reduction of Lindane Emissions**
- ❖ **International workshop on Dioxins/Furans from Combustion**
- ❖ **Mercury Assessment**
- ❖ **Assistance in Design of China's GEF Project on Elimination of PCBs**

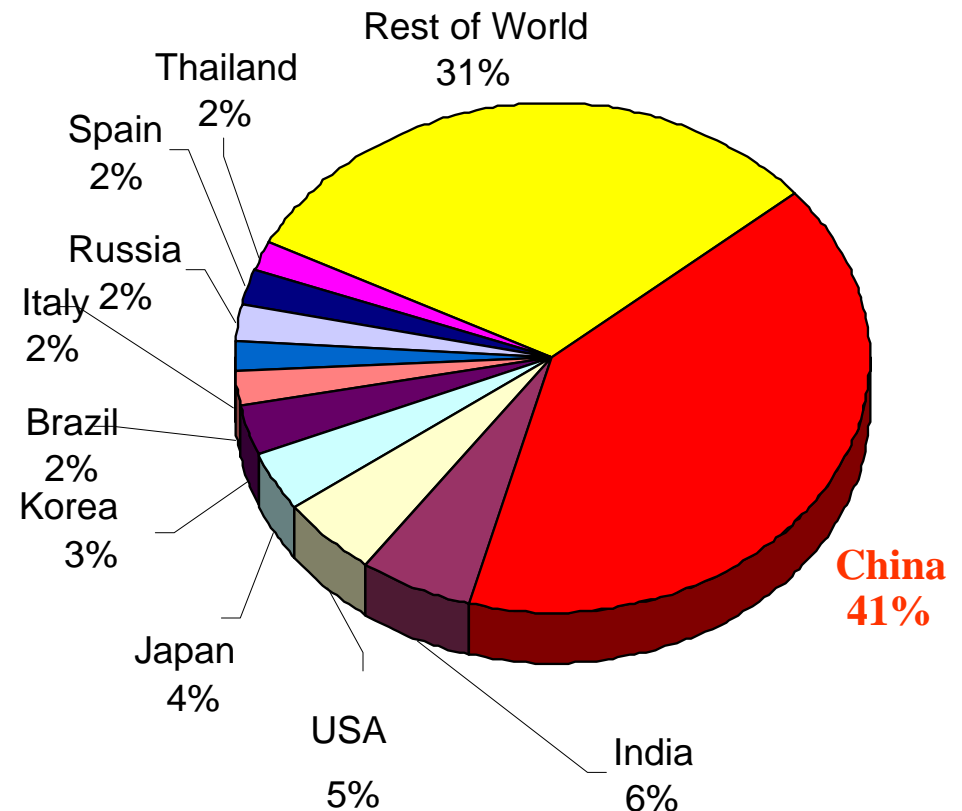


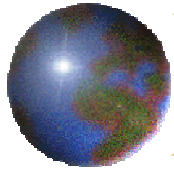
Managing Unintentional Releases of Dioxins & Furans in China

Problem:

- ❑ Fuel used in cement production is a significant source of dioxins/furans
- ❑ China has no maximum achievable control technology (MACT) standards or permitting process or emissions standards for dioxins/furans
- ❑ Shift to chlorinated hazardous waste as fuel will increase dioxins/furans emissions
- ❑ Some Chinese cement kilns are beginning to burn chlorinated hazardous waste as fuel

World Cement Production





Why Manage Dioxins/Furans from Cement Kilns in China?

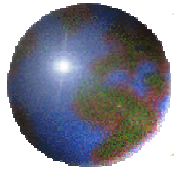
✦ Objectives:

▣ Long Term

- Reduce releases of dioxins/furans from China's cement kilns by **40 – 60%**
- Partner with multinational firms (Holcim and LaFarge) to improve environmental performance of cement kiln

✦ Projects

- ▣ Reduce and avert dioxins/furans emissions from cement kilns
- ▣ Develop model permit program for cement kilns in Asia

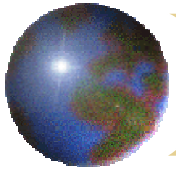


Map of China



Identification and Assessment of
Cement Kilns in Two Pilot
Provinces:

1. Xinjiang
Autonomous Region
2. Shandong Province



Contact Information:

Office of International Affairs Toxics Team

✚ Bob Dyer, Team leader
202-564-6113

Dyer.bob@epa.gov

✚ Angela Bandemehr
Deputy team leader
202-564-1427

Bandemehr.angela@epa.gov