Great Lakes Mercury Reduction Accomplishments and Future Challenges

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Alexis Cain
USEPA Region 5
Joy Taylor Morgan
Michigan Department of Environmental Quality

Outline

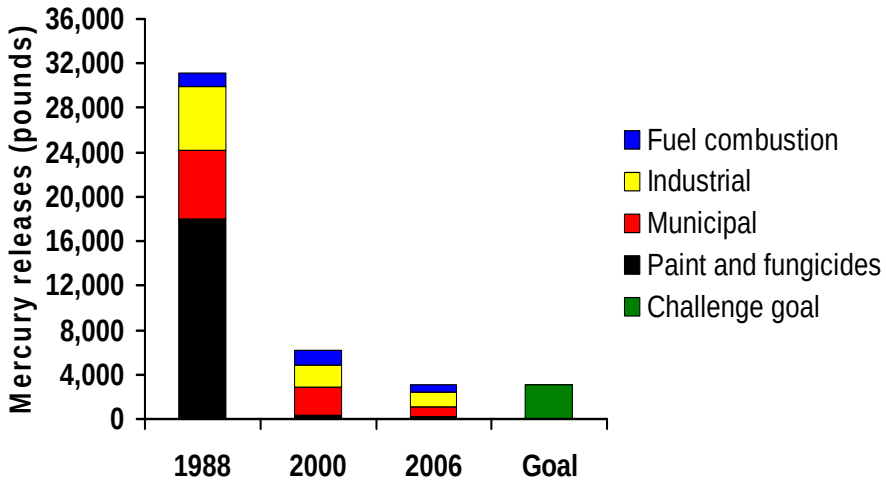
- Great Lakes Binational Toxics Strategy
- Great Lakes Regional Collaboration
  - Mercury Product Phase-down Strategy
  - Mercury Emissions Reduction Strategy

NOAA, Great Lakes Environmental Research Laboratory

Great Lakes Binational Toxics Strategy

- US-Canada Agreement, Signed 1997
- Virtual Elimination of Persistent Toxic Substances from Great Lakes
- Stakeholder Workgroup Following 4-Step Process:
  - Information gathering, on sources, uses, and impacts
  - Analysis of current regulations, initiatives and programs and identification of gaps
  - Identification of cost-effective options to achieve further reductions
  - Implementation of actions toward the goal of virtual elimination

Ontario Mercury Releases



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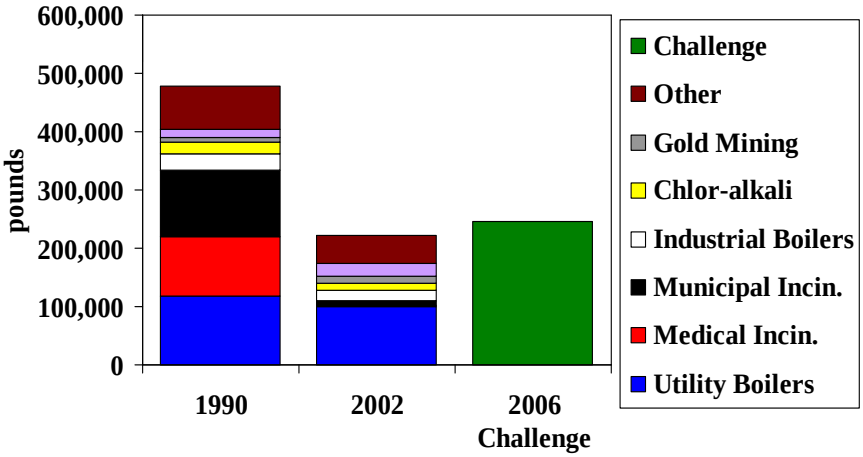
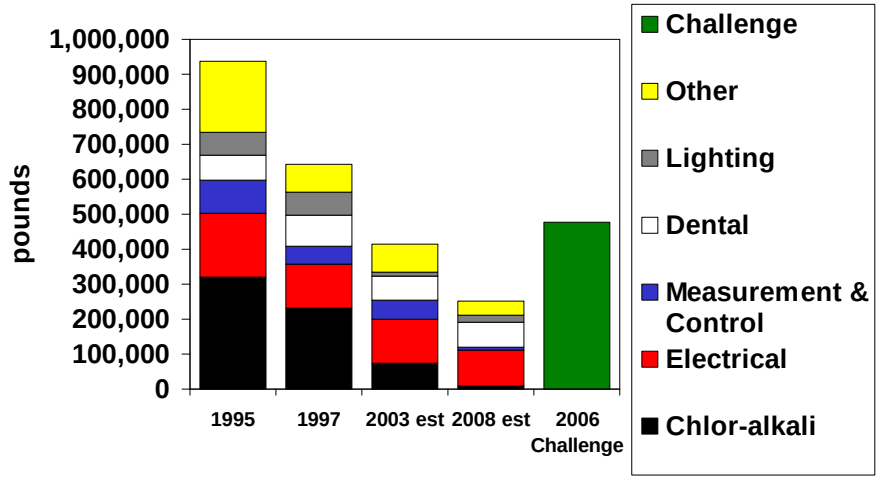
U.S. Mercury Emissions: 2006 Challenge, 1990 Baseline



U.S. Mercury Use



Source: US Geological Survey, Minerals Yearbook, 1996, 1997. Chlorine Institute Annual Reports to EPA, 2004; National Electrical Manufacturer's Association, direct communication, 2004, NEWMOA fact sheets.

Achievements: Voluntary Agreements

- Chlorine Institute: commitment to reduce chlor-alkali industry mercury use 50% between 1995 and 2006
  - Submitted 12 annual reports to date, documenting 94% reduction in use (beyond reductions from shutting capacity)
  - Improvements in mercury accounting
- American Hospital Association, 1998 Agreement
  - Virtual elimination of mercury from hospital waste
  - Formation of Hospitals for a Healthy Environment and Practice Green Health

...Achievements: Voluntary Agreements

- Northwest Indiana Steel Mills (International Steel, Ispat Inland, U.S. Steel): 1998 Agreement
  - inventory of mercury devices in use
  - 90% reduction goal by 2008 achieved

Great Lakes Regional Collaboration

- Multi-Stakeholder Process Created by 2004 Presidential Order– www.glrc.us
- Overseen by: Federal Interagency Task Force; Mayors; Governors; Tribal Leaders; GL Congressional Delegation
- December 2005 GLRC Report called for "basin-wide mercury product stewardship strategy"
- Phase-down drafting team: included all GL State environmental agencies, tribes, cities
- Expert review; stakeholder review; public comment, then Strategy approved by GLRC Executive Committee—June 19, 2008

Mercury Phase-down Strategy Team

- Formed in Spring 2006
- Representatives from:
  - each of the Great Lakes States
  - Tribes: GLIFWC, Chippewa Ottawa, Lac du Flambeau Band, Nottawaseppi Huron Band of Potawatomi, Sault Sainte Marie Tribe of Chippewa Indians, Seneca Nation
  - GL & St. Lawrence Cities Initiative, Superior, WI
  - USEPA
  - Coordinator: IL Waste Management & Research Center

Priority Products and Sectors

Products

- Dental Amalgam
- Switches, Relays & Control Devices
- Fever Thermometers
- Lamps
- Thermostats

Sectors

- Industry/Manufacturing
- Schools
- Steel Manufacturing
- Healthcare/ Veterinary care
- Households (including button cell batteries)

Recommendations-- 59

- Bans on sale of some mercury-containing products
  - Thermostats
  - Switches, relays and measurement and control devices (with a mechanism to allow for exceptions)
  - Fever thermometers
  - Button cell batteries (by 2011)
- Ban on mercury use in schools
- State government purchasing policies to avoid mercury where appropriate

Recommendations (cont.)

- **Mandated best management practices for mercury containing wastes for:**
  - **Dental offices (including amalgam separator installation)**
  - **Lamps (except households)**
  - **Mercury in state-owned facilities**
  - **Consider for auto switches, appliances and other mercury-containing products likely to end up in steel scrap**
- **Consider producer responsibility approaches**

Recommendations (cont.)

- Promote better practices through education, cooperation, voluntary programs
  - Dental school and continuing dental education programs on best management practices
  - Removal of bulk elemental mercury from dental offices
  - Expanded household hazardous waste program availability
  - Education and outreach to general public, hospitals, veterinary clinics, schools, scrap recyclers, steel makers, heavy industry
  - Participation in National Vehicle Switch Recovery Program

Implementation

- Workgroup formed to share information about implementation/ discuss priorities.
- Each state has already taken significant actions to implement recommendations.
- Each state has recommendations that it has not begun to address.
- Report on Implementation Progress—Summer 2010

Mercury in Product Phase-Down Strategy Team

Randy Case & Jon Heinrich (WI), John Gilkeson (MN), Jane Greber, DanLapato, Glenn Mitzel & Sharon Trostle (PA), Kevin Greene, Becky Jayne & Debra Jacobson (IL), Marcia Horan & Steve Kratzer (MI), William Narotski (OH), Peter Pettit (NY), Pat Daniel & Karen Teliha (IN), Diane Thompson (City of Superior), Reggie Cadotte, Matt Hudson, Kelley James McKnight & Ann McCammon Soltis (GLFWC), Jennifer Dale & Mike Ripley (Chippewa Ottawa), David B Jones (Nottawaseppi Huron Band of Potawatomi), Sylvia Patterson (Seneca Nation), Gretchen Watkins (Lac Du Flambeau Band of Chippewa), Dan Tadgerson (Sault Sainte Marie Tribe), Deb Jacobson (GLRPPR) Alexis Cain, Jessica Winter, Sania Tong-Argao & Edwin Smith (USEPA).

Mercury Emissions Reduction Strategy- Mission: To write a Basin-wide strategy to reduce mercury emissions in the Great Lakes Region

Joy Taylor Morgan,
Michigan Department of Environmental Quality

Great Lakes States' Mercury Emissions Reduction Strategy

- Great Lakes Regional Collaboration Executive Committee, October 2007
- Goal: to "produce institutionalized activities to sustain mercury emissions reduction" from unregulated sources, and regulated sources with potential for additional reduction
- Council of Great Lakes Governors sent letters to Great Lakes states' Environmental Directors requesting state representative appointments from air programs (11/08)

Great Lakes States' Mercury Emissions Reduction Strategy

- Where consensus exists, develop recommendations for regulatory/non-regulatory approaches
- Where consensus is not possible, list available options
- Stakeholder input: "solicit input from stakeholders on an ongoing basis using the existing Great Lakes Binational Toxics Strategy mercury workgroup."

Great Lakes States' Mercury Emissions Reduction Strategy

- Management level group
- Technical Staff Group
- All Great Lakes States represented
- Numerous conference calls/emails

Why air?

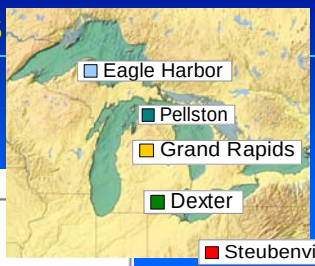
- Primary pathway for input to the Lakes
- Most of the individual emissions sources that contribute most mercury deposition to the Great Lakes are within the Great Lakes states.

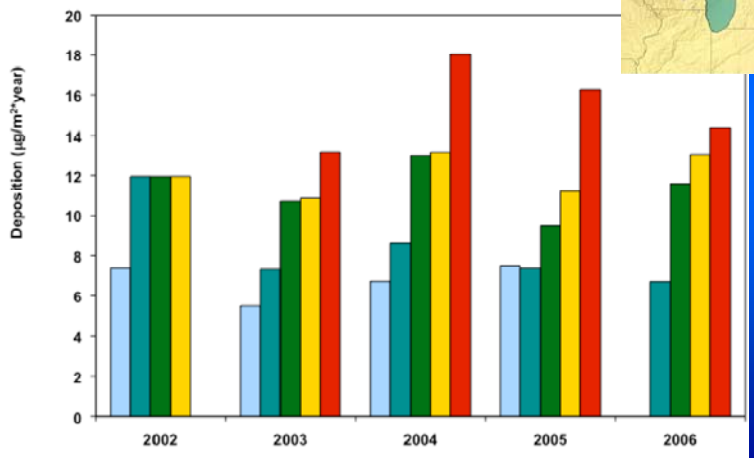
U.S. EPA REMSAD MODEL

Table B: Percentage of Mercury Deposition within State Resulting from Sources of Various Types, at the Site of Maximum Impact from Within-State Sources

	Within-state	Neighboring States	Other U.S.	Canada/ Mexico	Background	Re-emissions
NY	45.6	4.7	10.3	5.7	32.2	1.5
PA	89.8	1.6	1.2	0.1	9.2	0.4
IL	56.3	5.8	3.7	0.1	32.6	1.4
IN	56.7	7.5	3.4	0.1	35.3	1.9
MI	61.7	3.2	3.4	2.0	28.4	1.3
MN	55.4	0.4	3.3	0.2	39.2	1.5
OH	42.2	10.2	4.5	0.2	45.7	3.1
WI	50.9	2.3	3.5	0.1	41.6	1.6

Total Annual Hg Wet Deposition for Michigan sites 2002-2006





Criteria for Selecting Sectors to Consider for the Strategy

- Source sectors with the highest total emissions.
- Source sectors that might be expected to have high deposition within Great Lakes Basin (due to speciation profile) or high local emissions impact (because of big individual sources).
- Source sectors with potential for future emissions growth.
- Source sectors whose emissions are not already being addressed by federal or basin-wide state regulations or voluntary efforts.

U.S. Army Corps of Engineers, Detroit District

Focus on 7 Broad Sector Categories

- Utility boilers
- Non-Utility fuel combustion
- Mercury cell chlor-alkali plants
- Metals production
- Mercury emission related to product use and disposal
- Cement production
- Waste incineration

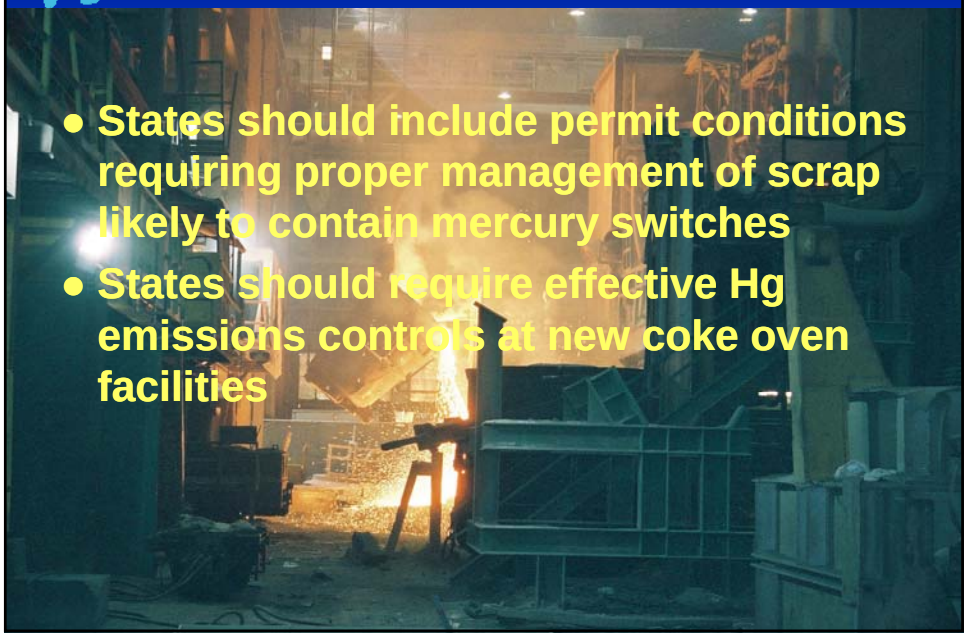
Recommendations - 34

- **Fossil Fuel Electric Power Generation – 5**
- **Commercial/Institutional Boilers – 2**
- **Mercury Cell Chlor-alkali plants – 2**
- **Metals Production – 6**
- **Products/Processes that use Hg – 6**
- **Portland cement manufacturing - 1**
- **Waste Incinerators – 3**
- **Cross-cutting strategies – 7**
- **Implementation – 2**

Coal-Fired Electric Generating Units

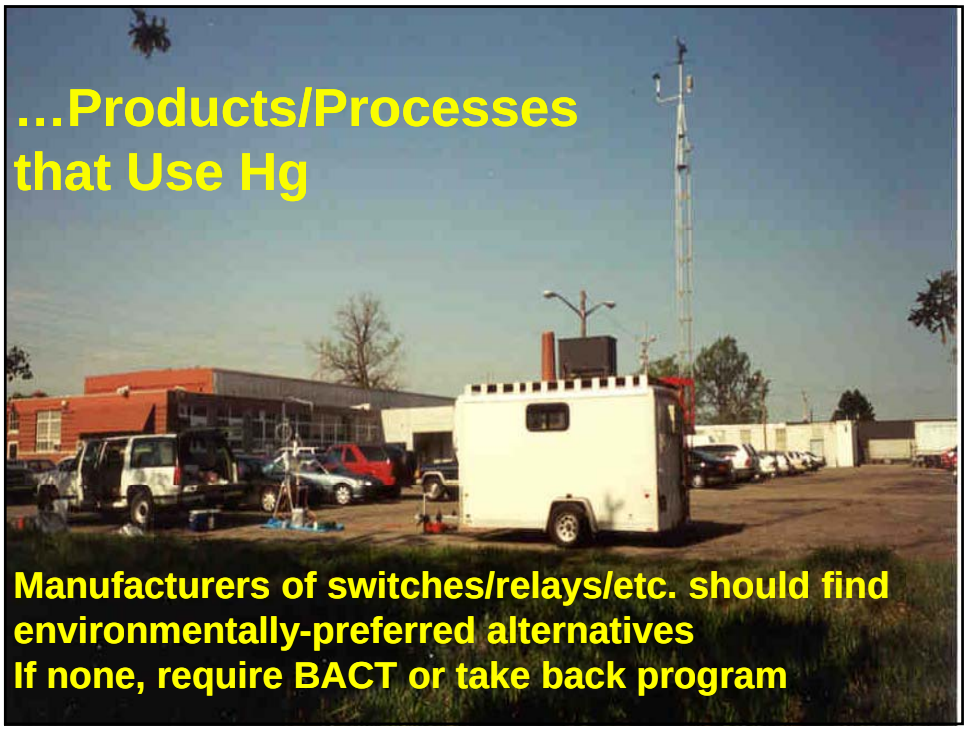
- States currently developing rules should continue within their proposed schedule
- If a federal rule is not proposed by 2013, states should consider developing their own rules

Metal Production

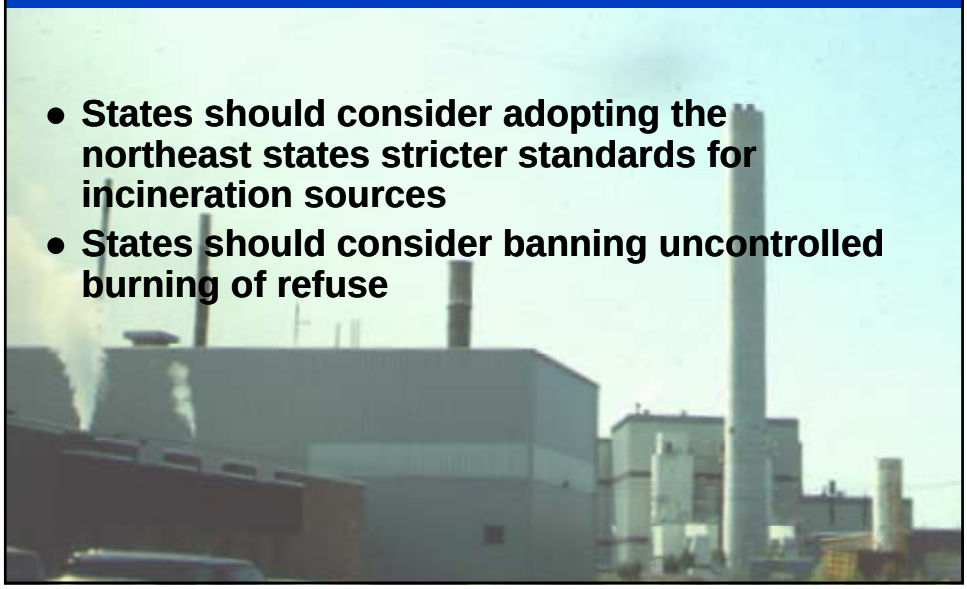


- States should include permit conditions requiring proper management of scrap likely to contain mercury switches
- States should require effective Hg emissions controls at new coke oven facilities


Products/
Processes
Recommend recycling of all lamps and follow ALMR's BMPs for drum crushers

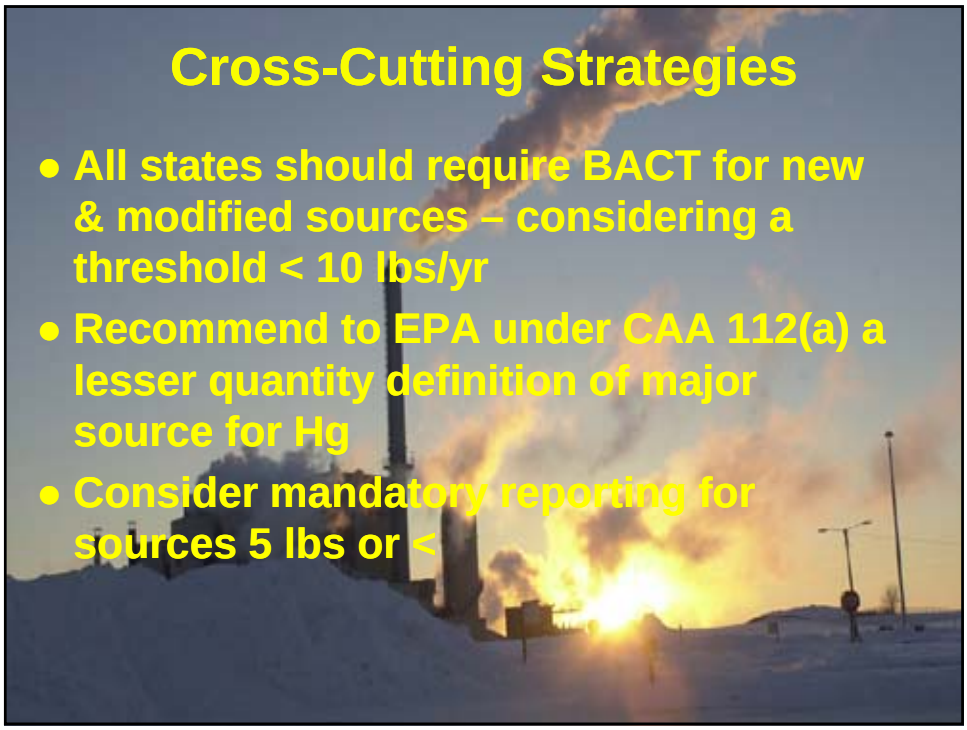

…Products/Processes that Use Hg
Manufacturers of switches/relays/etc. should find environmentally-preferred alternatives
If none, require BACT or take back program

Waste Incinerators



- States should consider adopting the northeast states stricter standards for incineration sources
- States should consider banning uncontrolled burning of refuse

Cross-Cutting Strategies



- All states should require BACT for new & modified sources – considering a threshold < 10 lbs/yr
- Recommend to EPA under CAA 112(a) a lesser quantity definition of major source for Hg
- Consider mandatory reporting for sources 5 lbs or <

Implementation

- States should publicly identify its implementation priorities and the organizations responsible for achieving them
- Identify a representative and work with various partners to achieve success

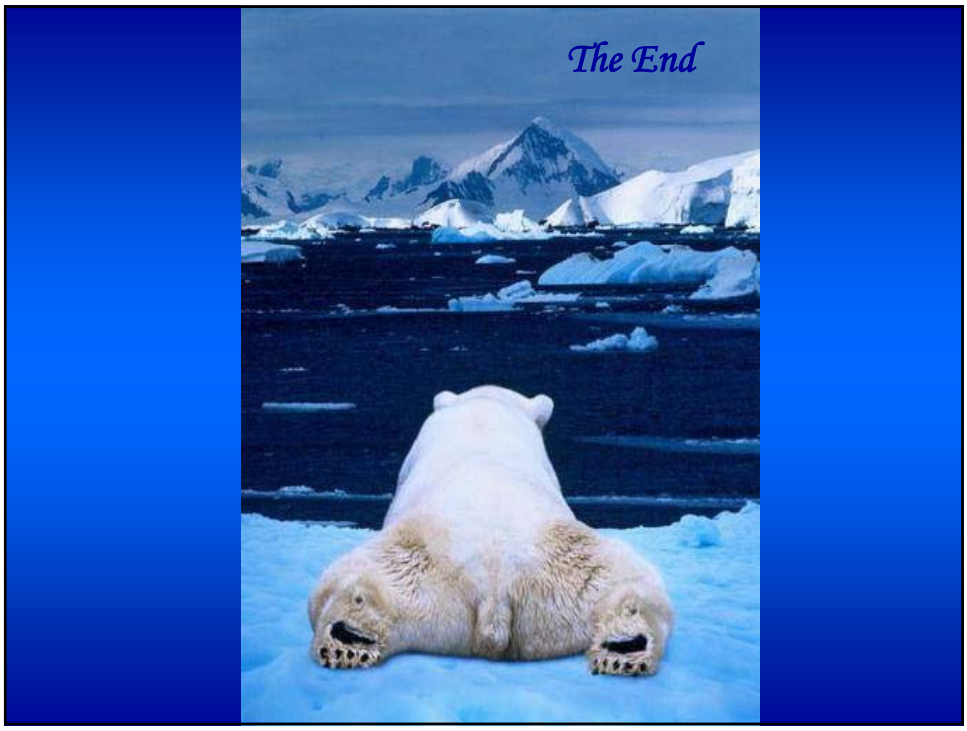
Public Review Process

- Approval by Governors' Offices
- Currently under public review 10/09 – 12/09
- Comments on Strategy due: 1/12/10
- Deb Jacobson: djacobson@istc.illinois.edu (630) 472-5019
- To GLRC Executive Committee & "Response to Comment"

Mercury Emission Reduction Strategy Technical Team

Jon Bates, Brian Wolff (IN), John Booser, Steve Gross, Dan Husted, Daniel Lapato, Glenn Mitzel, Sharon Trostle (PA), Ned Brooks (MN), Marty Burkholder (WI), Shelly Cabrera (USEPA), Steve DeSantis, Tom Gentile, Rick Leone, Ron Stannard, Steve Yarrington (NY), Jon Heinrich (WI), Anne Jackson (MN), Frederick Jones (OH), Dennis McGeen, Joy Taylor Morgan (MI), Tammy Mitchell, Dixon Nwaji, Jim Ross (IL), Deb Jacobson (GLRPPR), Alexis Cain (USEPA).

Contacts:
Alexis Cain, EPA (312) 886-7018
cain.alexis@epamail.epa.gov &
Joy Taylor Morgan, MDEQ
taylorj1@michigan.gov
(517) 335-6974



Send Strategy comments to:

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Mercury Emissions Reductions Strategy Available at:

http://www.glrc.us

http://glrppr.org