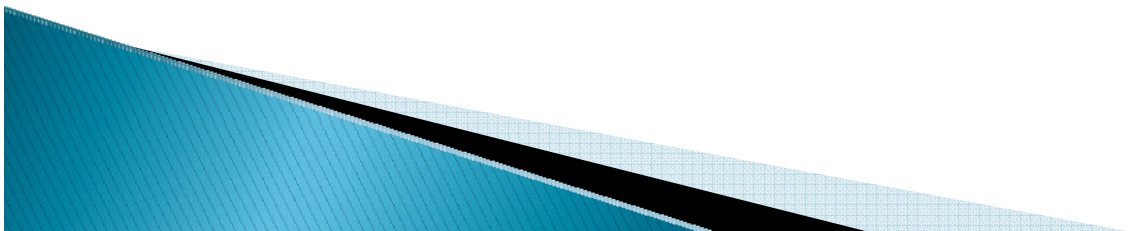


The Transition to Mercury Free Products

David Lennett
Natural Resources Defense Council &
Zero Mercury Working Group
OEWG – Bangkok
October 22, 2009

Summary of Presentation

- ▶ Global Product Mercury Demand Status Quo and Partnership Goals
- ▶ Findings of UNEP Report Prepared for OEWG 2
- ▶ Closer Look at 3 Product Categories
 - Switches
 - Thermometers
 - Button cell batteries
- ▶ Conclusions for a Successful Transition



Product Category	2005 Global Demand (Metric Tons)	2015 UNEP Partnership Goal (Metric Tons)
Batteries	300–600	Less than 50
Electronic Devices	150–350	Less than 50
Measuring and Control Devices	150–350	Less than 50
Lighting	100–150	Less than 100
Dental	240–300	Less than 230
Other (lab, cultural uses, etc)	30–60	Less than 30

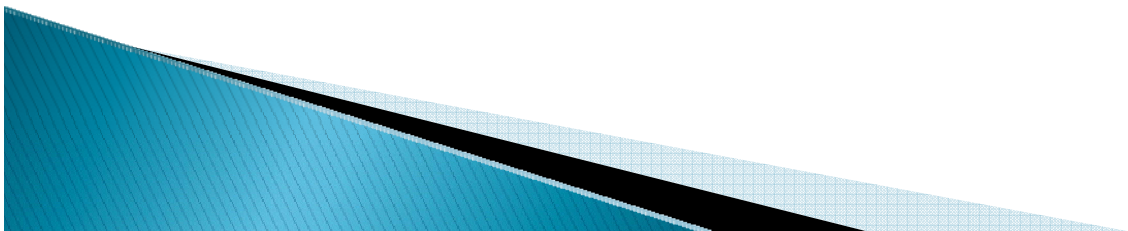
Global Product Mercury Demand Status Quo and Partnership Goals



2008 UNEP Products Report Findings

- ▶ Definition of Transition Success
 - More than 50% of governments indicated non-mercury substitutes available, commonly used, and no negative consequences; and
 - Two or more governments indicated no mercury use for this product in 2009 or before

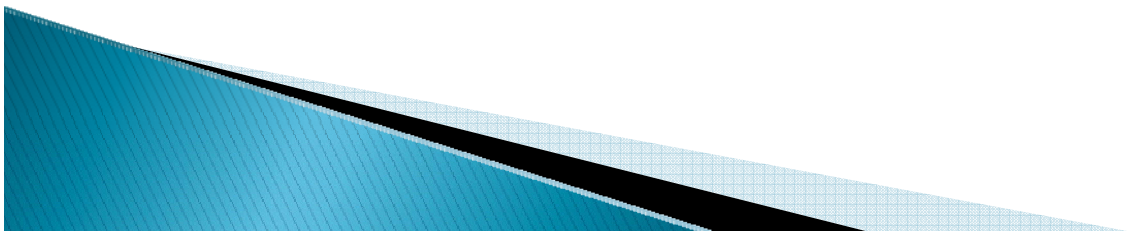
Ref: UNEP(DTIE)/Hg/OEWG2/7/Add.1



Transition Success Demonstrated

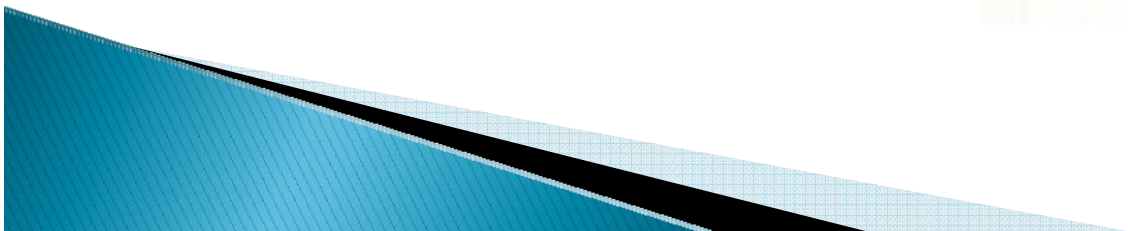
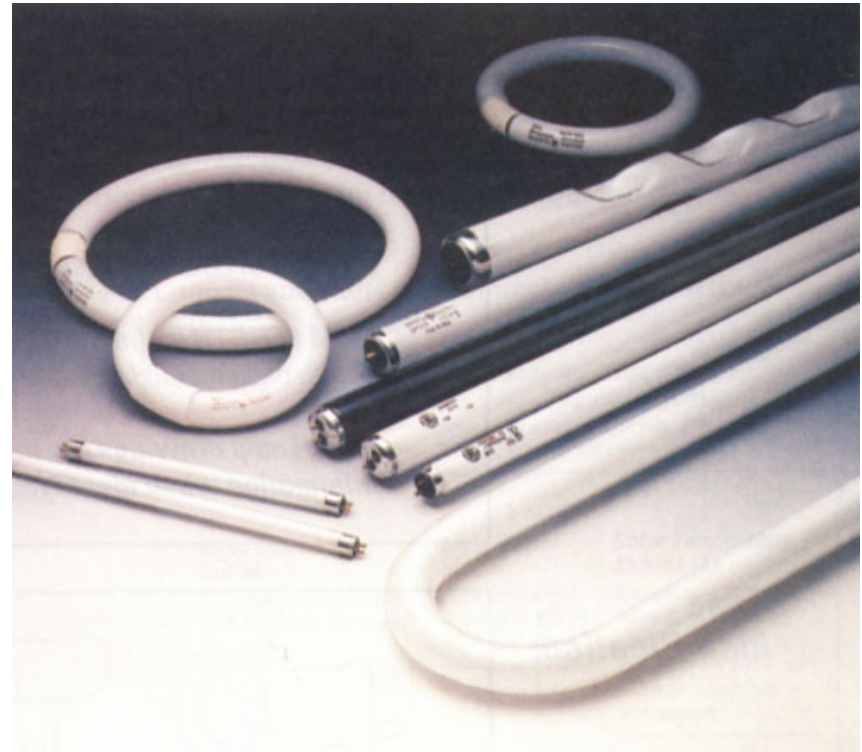
- ▶ Transition Success Demonstrated for
 - Switches/relays
 - Thermometers
 - Sphygmomanometers
 - Thermostats
 - Batteries (other than button cells)
 - HID Auto Discharge Lamps

- ▶ Note: Transition success does not mean there are no challenges ahead – see discussion below



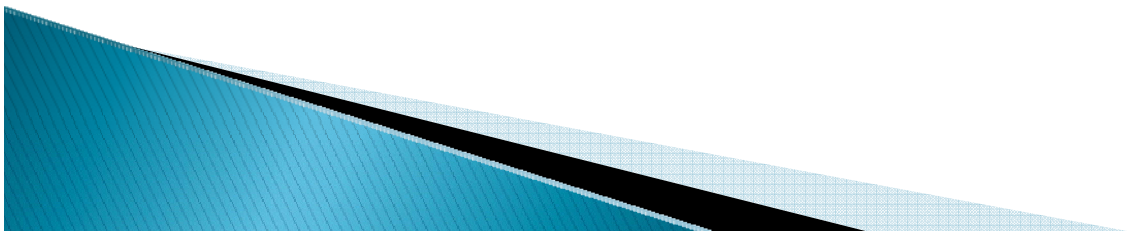
Alternatives Available But Obstacles Remain

- Button cell batteries
- Dental amalgam
- Lamps of various types

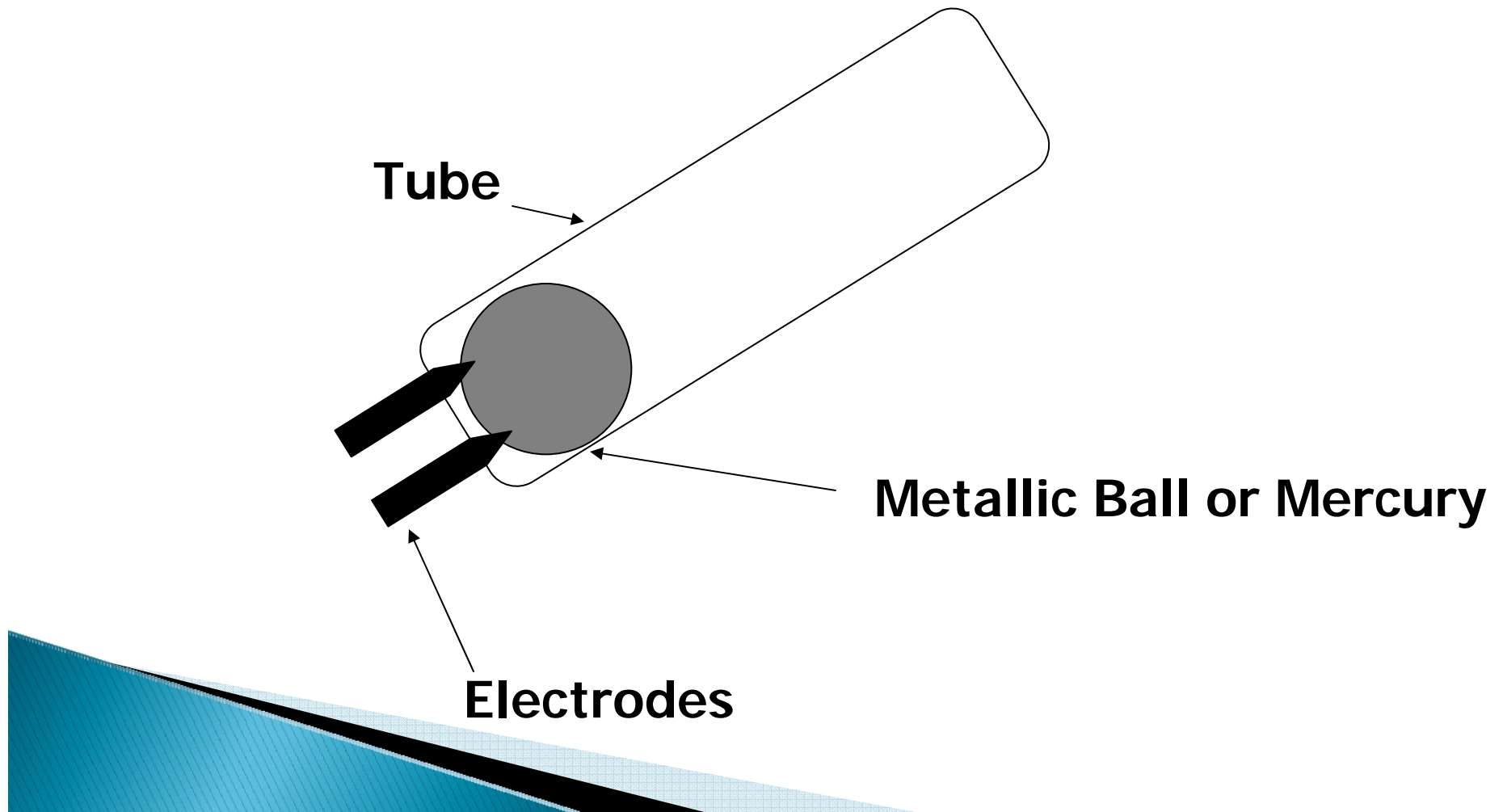


Switches

- ▶ Four major types of switches
 - Tilt (activates light or equipment upon change in position) (example: **car trunk lights**)
 - Float (activates alarm or equipment upon change in liquid level) (example: **bilge pump**)
 - Temperature (activates heating or cooling equipment upon change in temperature) (example: **refrigeration equipment**)
 - Pressure (uses pressure sensor to activate a mercury switch) (example: various **industrial applications**)

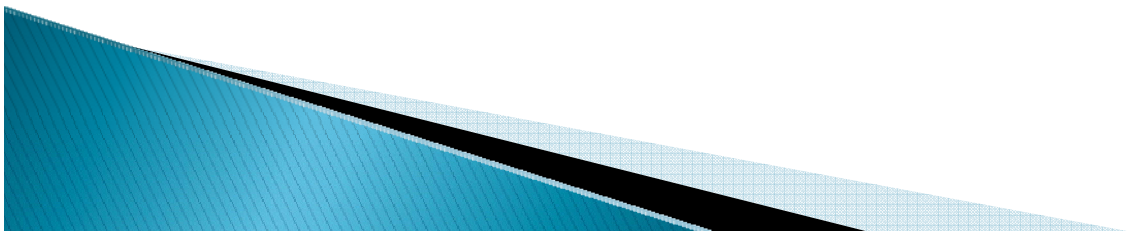


Tilt Switch In On Position



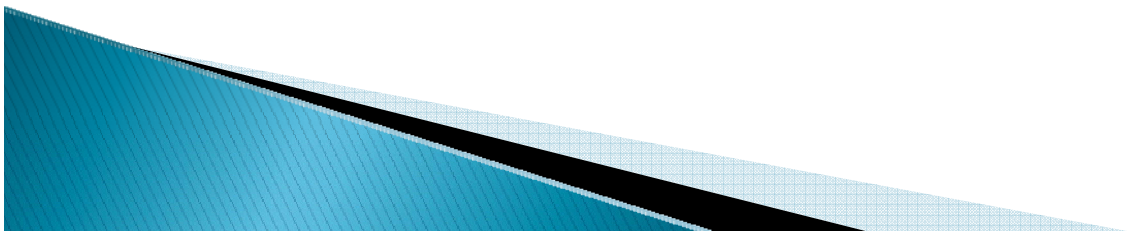
Examples of Non-Mercury Switches

- ▶ Metallic ball switches
 - ▶ Solid-state switches
 - ▶ Electrolytic fluid switches (alternative conductive liquid)
 - ▶ Optical sensor float switches
- ▶ Variety of products available at comparable cost, and comparable or better performance



Mercury Switch Legislation

- ▶ Several European countries banned sale in 1990s
- ▶ EU RoHS Directive adopted in 2003 and effective in July 2006 (scope to expand and likely include medical and monitoring/control instruments after 2010)
- ▶ 11 states with more than 30% of USA population have enacted sales bans, effectively driving many mercury switches off the USA market
- ▶ Studies in USA confirm non-mercury alternatives available for most applications
- ▶ EU Directive triggering RoHS type legislative initiatives in other countries; industry rapidly moving to mercury free alternatives

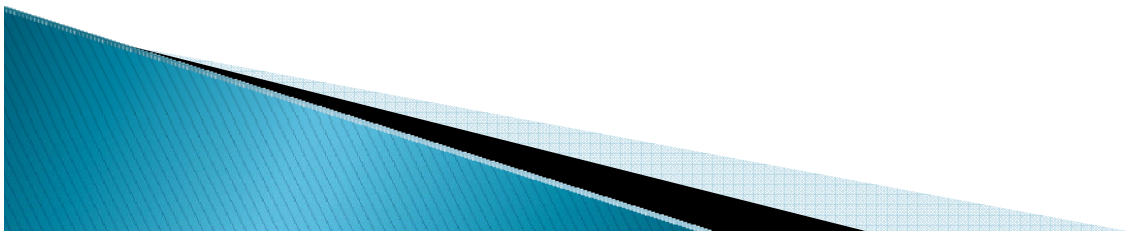


Thermometers

- ▶ Used in variety of ways
 - Food handling and processing
 - Ambient air measurements
 - Laboratories
 - Industrial applications
 - Fever measurements



- ▶ Vast majority of mercury use and focus here is fever thermometers



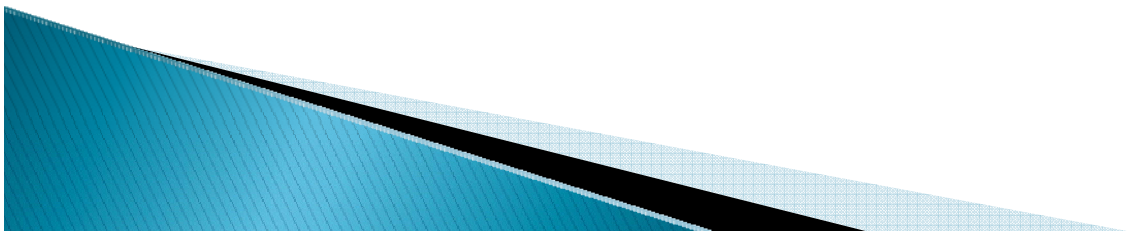
Alternative Fever Thermometers

- ▶ Non-mercury liquid (i.e., alcohol, galinstan – mixture of gallium, indium, and tin)
- ▶ Digital (powered by variety of battery types or solar)
- ▶ For list of example products, see http://www.sustainablehospitals.org/cgi-bin/DB_Report.cgi?px=W&rpt=Cat&id=15



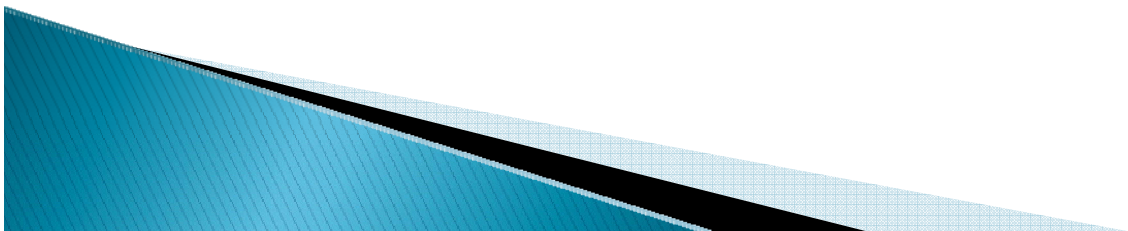
Fever Thermometer Legislation

- ▶ Some EU countries ban sale of mercury fever thermometers in 1990s
- ▶ EU adopts ban on market introduction of fever thermometers in 2007, effective April 2009
- ▶ HCWH reports 28 states in USA have prohibitions or restrictions on sale of fever thermometers, and most USA retail outlets refuse to carry them
- ▶ HCWH reports sales ban or phase out in health care sector recently adopted by –
 - Argentina
 - Uruguay
 - Philippines



Transition Status for Fever Thermometers

- ▶ No negative effects where legislation in place, as UNEP report found
- ▶ However, issues of cost, availability and quality control have been raised in some parts of developing world
- ▶ Experience indicates these issues can be solved, with collaboration by key players and appropriate legal framework
 - See information on WHO/HCWH global initiative at <http://www.mercuryfreehealthcare.org/about.htm>



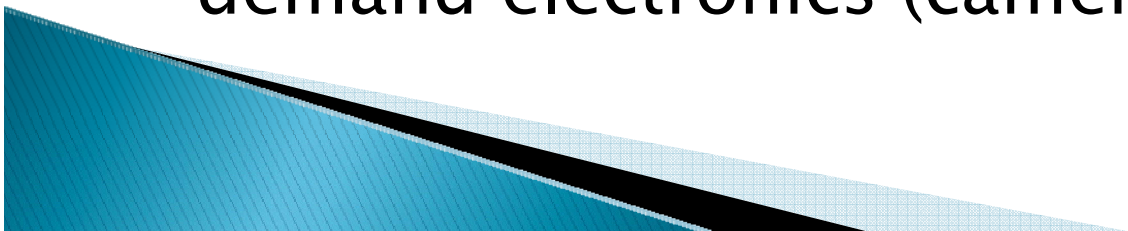
Button Cell Batteries

- ▶ Three types of mercury-containing button cells (mercury used to inhibit gas formation which can cause battery leakage)*
 - Zinc air used primarily in hearing aids
 - Silver oxide used primarily in watches and cameras
 - Alkaline manganese used in variety of products, such as digital thermometers, remote controls, and toys
- * Some trade data indicate mercury oxide button cells are still manufactured, but these data have not been confirmed and manufacture would be illegal in many relevant countries



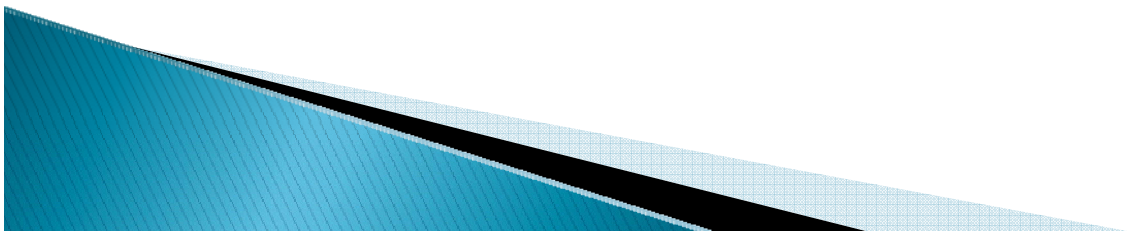
Manufacturers of Non-Mercury Alternatives

- ▶ Zinc Air
 - Energizer, Rayovac
- ▶ Silver Oxide
 - Sony, Seiko, Hitachi, VARTA Microbattery, Chung Pak, Pak Ko, New Leader
- ▶ Alkaline Manganese
 - New Leader, Leopro Battery, Chung Pak, Taishan Battery; silver oxide batteries can generally substitute as well
- ▶ Lithium batteries can sometimes be used as substitutes, particularly in high energy demand electronics (cameras, games)




Battery Transition Status

- ▶ Mercury free technology in use by variety of manufacturers
- ▶ USA manufacturers committed to mercury free production by 2011 in response to state legislation
- ▶ Recent reports in USA find sufficient mercury free alternatives available, except for certain very low volume silver oxide models
- ▶ However, UNEP report finds non-mercury global production capacity now unable to meet worldwide demand

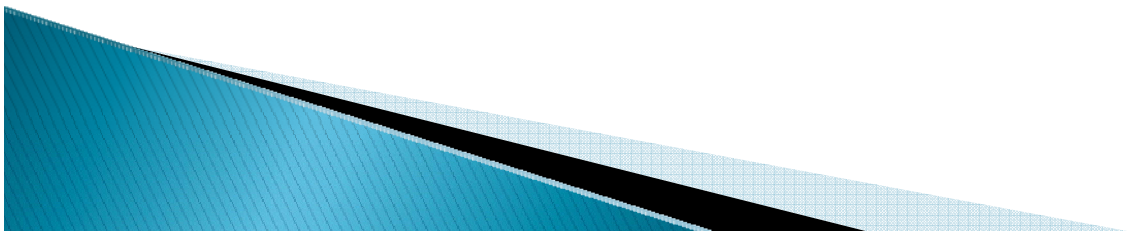


Conclusions

- ▶ For most mercury products, the alternative technology solution is known, and in use
 - ▶ Issues of production capacity, quality control, and cost may still arise in some parts of the world
 - Government mercury phase out laws and policies frequently trigger manufacturer involvement and expedited production shifts
 - Production increases can minimize price disparities
 - Remaining cost differential fails to reflect legacy costs for future generations and/or increased cost of handling/waste management
- 

Conclusions

- ▶ Inter-related issues of production capacity, cost, and quality control would benefit from mercury product treaty coverage
 - Clear legal and policy direction with timetables, providing critical market signals to manufacturers
 - Universal participation – no free riders
 - Data collection and transparent reporting to monitor progress
 - Improved opportunities for global coordination and collaboration on issues like standard setting
 - Improved opportunities for technical assistance, third-party testing, etc



Other Publications on Alternatives to Mercury containing Products are the following:

- ▶ [Options for reducing mercury use in products and applications, and the fate of mercury already circulating in society \(Final report, September 2008, European Commission Directorate-General Environment\)](#)
- ▶ [Mercury substitution priority working list, Nordic Council of Ministers, Copenhagen, 2007](#)
- ▶ [Alternatives to mercury containing measuring devices, Danish Ministry of Environment, 2006](#)
- ▶ [Interstate Mercury Education & Reduction Clearinghouse \(IMERC\) Mercury-Added Products Database, USA, 2007](#)
- ▶ [Lowell Center for Sustainable Production \(Maine, USA\) Study "An Investigation of Alternatives to Mercury Containing Products, 2003](#)

Links to the above publications are available at

[http://www.chem.unep.ch/mercury/Sector-Specific-Information/Mercury-in-products\(1\).htm](http://www.chem.unep.ch/mercury/Sector-Specific-Information/Mercury-in-products(1).htm)

