Great Lakes BiNational Toxics Strategy
Mercury Workgroup Meeting

MERCURY REDUCTION IN
ELECTRO-INDUSTRY PRODUCTS:
STATUS AND PERSPECTIVES

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NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
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NEMA VITAL STATISTICS

- Created 1926, Largest U.S. Trade Association of Electro-Industry Manufacturers
- Membership: Appr 430 US Manufacturers
  - 8 Industry Divisions, 50 Product Sections:
  - Products used for generation, transmission, distribution, control, and end-use of electricity
  - Batteries to Motors to Traffic Signaling Equip to X-Rays, etc.
- Industry Standards, Advocacy, Data Collection & Analysis
- More than 500 Industry Standards; Internally and With ANSI and IEC
**INDUSTRY USE OF MERCURY**

**INDUSTRY USE OF Hg HAS FALLEN DRAMATICALLY**

- Industry Consumption $\geq 2,000$ Tons in 1980
- USGS Estimated 350 Metric Tons in 1997
- GLBTS*: “On the basis of data reported by the chlor-alkali industry and the lamp industry, it is estimated that mercury use declined by more than 50 percent between 1995 and 2003. . . . . This may underestimate the actual decline, considering likely reductions in the use of mercury in measurement and control devices, switches and relays, and dental amalgam that have not been quantified.”

* GLBTS Management Assessment, Feb 2006, pg. v
U.S. mercury consumption, by end use; metric tons

MERCURY USE IN PRODUCTS

** EPA RoadMap Estimates 245 Metric Tons in 2001 **

FIGURE 3. Total 2001 U.S. Mercury Use in Products$^2$

- Total: 245 metric tons
- 103 metric tons (42%)
- 69 metric tons (28%)
- 34 metric tons (14%)
- 21 metric tons (9%)
- 17 metric tons (7%)

- Wiring Devices and Switches
- Measuring and Control Instruments
- Dental Equipment and Supplies
- Electric Lighting
- Other
# NEMA IMERC REPORTING: 2001-2004

## Pounds of Mercury Reported

<table>
<thead>
<tr>
<th>Product</th>
<th>2001</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamps</td>
<td>17,902</td>
<td>15,925</td>
</tr>
<tr>
<td>Batteries</td>
<td>3975</td>
<td>2874</td>
</tr>
<tr>
<td>Thermostats</td>
<td>28,485</td>
<td>27,659</td>
</tr>
<tr>
<td>Hg Switches - Medical</td>
<td>3.9</td>
<td>4.07</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>50365.9</strong></td>
<td><strong>46464.07</strong></td>
</tr>
</tbody>
</table>

(25.18t) (22.9t)
BATTERIES

** BUTTON CELLS **

- Only Remaining Mercury Containing Batteries
  - Used in hearing aids, digital thermometers, insulin pumps, portable medical monitors, hospital pagers, watches, toys, and calculators

- By Fed Law: Cannot Exceed 25 mg Mercury per cell

- Three BC Battery Chemistries
  - Silver oxide (watch) 2.5mg
  - Zinc air (hearing aid) 8.5 mg
  - Alkaline (misc.) 11 mg
Why Not Zero Mercury?

- Small size and need to provide maximum energy leaves little room for gas buildup before cell begins to bulge, possibly resulting in leakage and/or rupture

- Non-Hg Technology is Under Development

- NEMA Commitment is in place, for July 2011

NEMA PRESS RELEASE
March 2, 2006
NEMA Announces Battery Industry Commitment to Eliminating Mercury in Button Cells
ENERGY EFFICIENT LIGHTING

- **Fluorescent**
  - Schools, Offices, Stores

- **High Intensity Discharge**
  - Metal Halide
  - High Pressure Sodium
  - Cold Cathode ("Neon")
  - Mercury Vapor

- Street Lights, Floodlights, Industrial Lighting, Entertainment
LIGHTING Cont'd

- Hg Contributes to Efficient Operation of Fluorescent Lamps
  - Efficiently generates ultra-violet energy, which is absorbed by phosphor coating on glass. Phosphor fluoresces, emits visible light
  - Metal halide and most HPS use mercury as starting aid and voltage control

- Despite Hg Content, Many States, Localities, National Govts Moving to EE Lighting

- EPA, ENERGY STAR Program
  - “If every household in the US replaced one light bulb with an ENERGY STAR qualified CFL, it would prevent enough pollution to equal removing 1 million cars from the road.”
**Lamp Industry – Steady Progress in Reducing Hg Content**

Mercury Contained in Four Foot Fluorescent Lamp - Industry Average

<table>
<thead>
<tr>
<th>Year</th>
<th>Mg. of Mercury</th>
</tr>
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<tbody>
<tr>
<td>1985</td>
<td>48.2</td>
</tr>
<tr>
<td>1990</td>
<td>41.6</td>
</tr>
<tr>
<td>1994</td>
<td>22.6</td>
</tr>
<tr>
<td>1999</td>
<td>11.6</td>
</tr>
<tr>
<td>2001</td>
<td>8.3</td>
</tr>
<tr>
<td>2005</td>
<td>5.6</td>
</tr>
</tbody>
</table>
** LAMP RECYCLING **

- National Lamp Recycling Rate (ALMR)
  - Est at ~24% Nationwide (2004)
  - NEMA Computing Rate for MASS as per New Law

- Resources
  - www.lamprecycle.org
  - www.earth911.org
  - http://www.epa.gov/bulbrecycling/

- Activities
  - Utility collection programs in ME and MN
  - IKEA, others recycling at store outlets
  - Pilots in VT, NH, and other states utilizing various funding sources and collection sites
LIGHTING Contd

- NEMA Supports Recycling Policies *if they* . . .
  - Keep the cost of CFLs affordable to consumers
  - Develop sensible, cost-effective solutions for bulb collection and disposal to fit the widely variable circumstances of consumers nationwide
  - Provide a variety of consumer lamp recycling options
  - Involve *multiple stakeholders* in the effort to design recycling solutions and establish programs
  - Build upon the *existing* recycling infrastructure
  - Enable recyclers to pass the true cost of recycling to consumers and other stakeholders, allowing for price reductions as volumes increase and recycling technology improves.
** National Transition to Energy Efficient Lighting? **

- NEMA Supports Public Policies that will Transform the U.S. Market to More Energy-Efficient Lighting *Within a Decade*.

- Guiding Principles
  - The market transformation must be orderly; starting point is *least efficient* medium screw base A-line incandescent lamps, 40–100 w
  - Transition must be accomplished thru *performance standards*
  - Performance standards must be *technology-neutral*
  - Performance standards will be required for set of A-line incandescent lamps including frost, soft white and enhanced spectrum
  - The market transformation should begin with strategies that will save the most energy.
GLRC STRATEGY RECOMMENDATIONS

- **LAMPS**
  - Require Recycling - OK, but *Enforcement is Key*
  - Household Exemption is Good
  - Shared Responsibility is Good
  - Banning Technologies - *Market Solutions, Perf Strnds are Better!*

- **THERMOSTATS**
  - Sales Bans - OK, as Alternatives Exist
  - Mandate Recycling and Promote TRC - OK
  - Involve Retailers and HHW Facilities in Collection - OK
  - Financial Incentives from Mfr - ?????

- **SWITCHES AND RELAYS**
  - Remember Refurbished Products!
  - Keep Labeling Laws Consistent
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