



The Impact of Mercury Legislation on the Lighting Industry

www.lightfair.com

Tuesday June 4, 2002
8:30am – 10:00am

IALD

Sponsored by The International Association of Lighting Designers



Sponsored by The Illuminating Engineering Society of North America



Produced and Managed by AMC, Inc.



Official On-Site Event Directory

Speakers

Peter A. Bleasby, L.C.

Director: Industry Relations, OSRAM SYLVANIA

Chairman: Lamp Section, NEMA

Ric Erdheim

Senior Manager: Government Affairs, NEMA

Barry H. Jordan

National Accounts Manager, Onyx Environmental Services



Mercury and Lighting Overview

Peter A. Bleasby

www.lightfair.com

Scope of Legislation

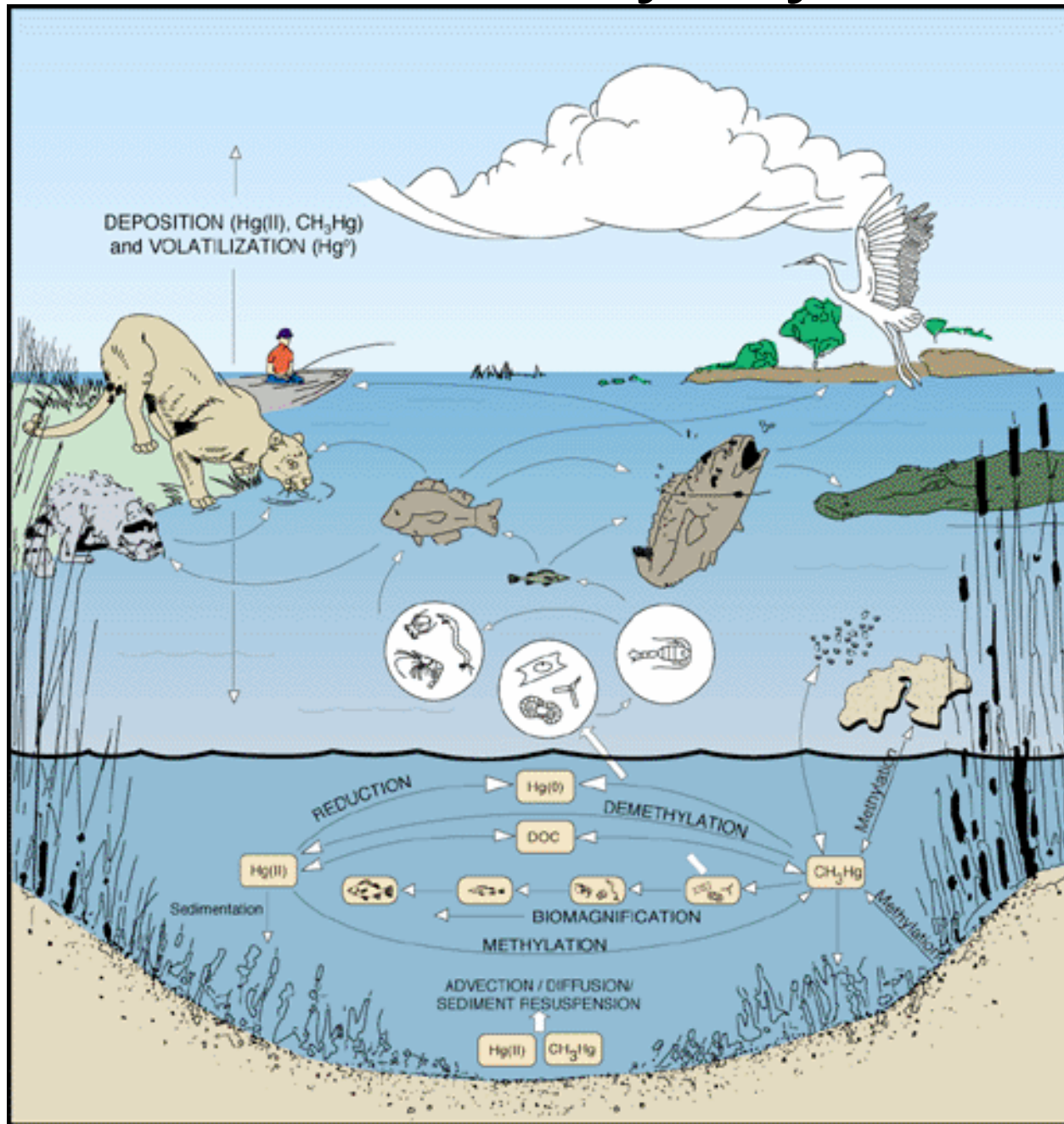
1. Any product containing any amount of “intentionally added” mercury irrespective of:
 - How much mercury it contains,
 - Whether it passes any “test”,
 - Its hazardous waste classification.

2. Includes products shipped with mercury containing components,
e.g. Fluorescent Luminaires.

Mercury

- Naturally occurring toxic element
- Concern with build up in the environment
- Freshwater fish advisories at state level
- Mercury report to Congress 1997
- Conflicting Studies
- Extreme Environmentalist issue
 - Plan to “virtually eliminate” mercury

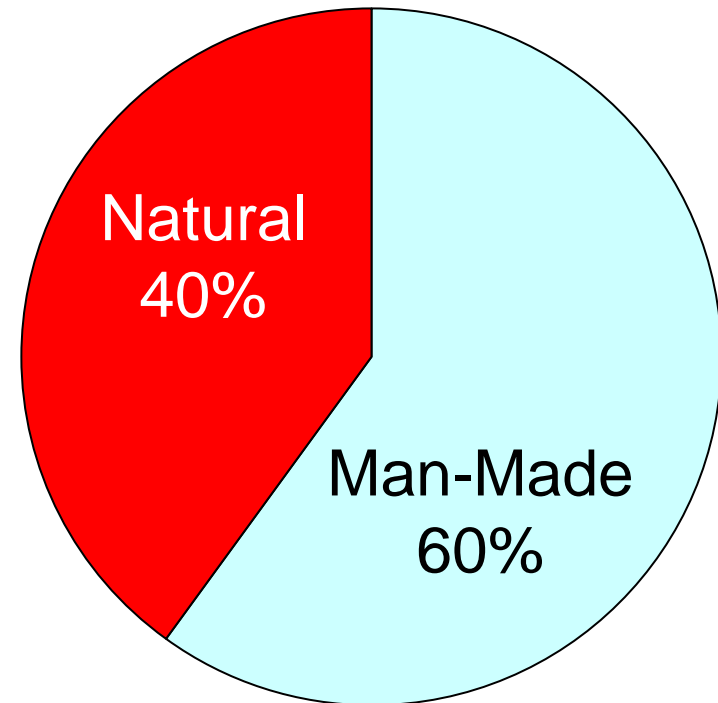
The Mercury Cycle



Sources of Mercury Emission

Natural

e.g Volcanoes
Oceans
Forest Fires



Man-Made

e.g Fossil Fuels
Incineration
Waste Disposal
Industrial Processes

Man-Made Emissions (U.S.)

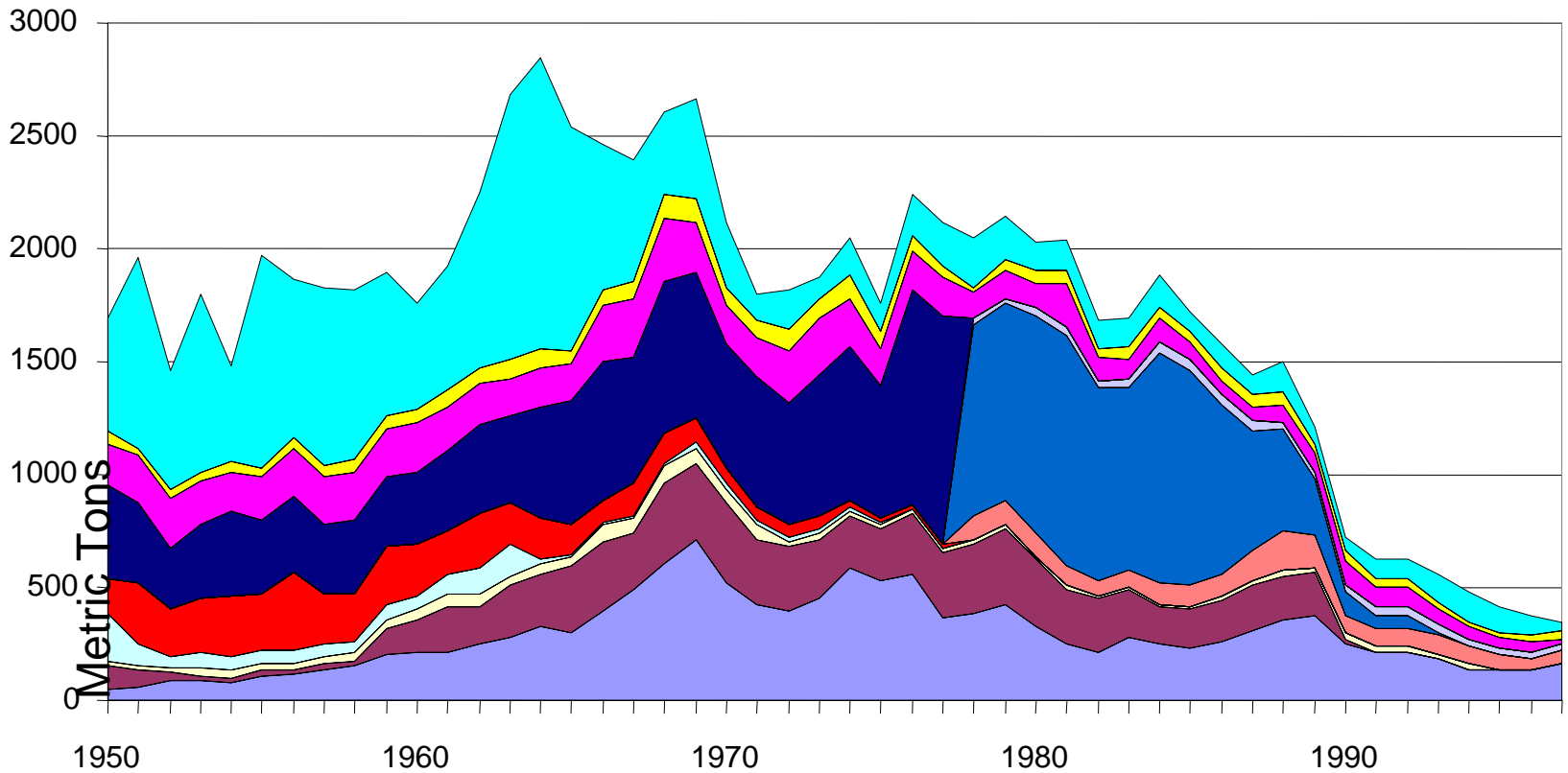
Tons (2002)

Coal Fired Utilities	43
Incineration (all)	14
Vehicles	7
Chlorine	10
Other (Incl Lighting)	42

Lamp Disposal

Breakage	.16 - 1.0
Landfill	<0.1
Recycle	<0.1
Incineration	<0.3

U.S. Mercury Consumption



Source: U.S. Bureau of Mines

- Other
- Dental uses
- Measuring & control instruments
- Electrical, total; includes wiring devices, batteries, lighting prior to 1977
- Lighting
- Batteries
- Wiring devices & switches
- Agriculture
- Pharmaceuticals
- Laboratory uses
- Paint
- Chlorine & caustic soda mfg.

Mercury in Lamps

Which lamps?

- Fluorescent
- Mercury
- Metal Halide
- High Pressure Sodium (most)
- Cold Cathode (“Neon”)

Purpose of Mercury in Lamps

- Fundamental to efficient operation of fluorescent lamps
 - Efficiently generates ultra-violet radiation that is converted to visible light by the phosphor
 - A “no-mercury” fluorescent lamp loses ~ 70% efficiency
 - No prospect for elimination of mercury
- Metal halide and most HPS use mercury as starting aid and voltage control
 - Some prospects for elimination (e.g., Hg-free HPS)

Mercury Free Lamp Options

Source

Incandescent

Low Pressure Sodium

Hg-Free HPS

High Pressure Sulfur

Xenon Barrier Discharge

LED's

Field Emission

Current Barriers

Efficacy

Color Rendering, Disposal

No Wattages > 150, "Cycles"

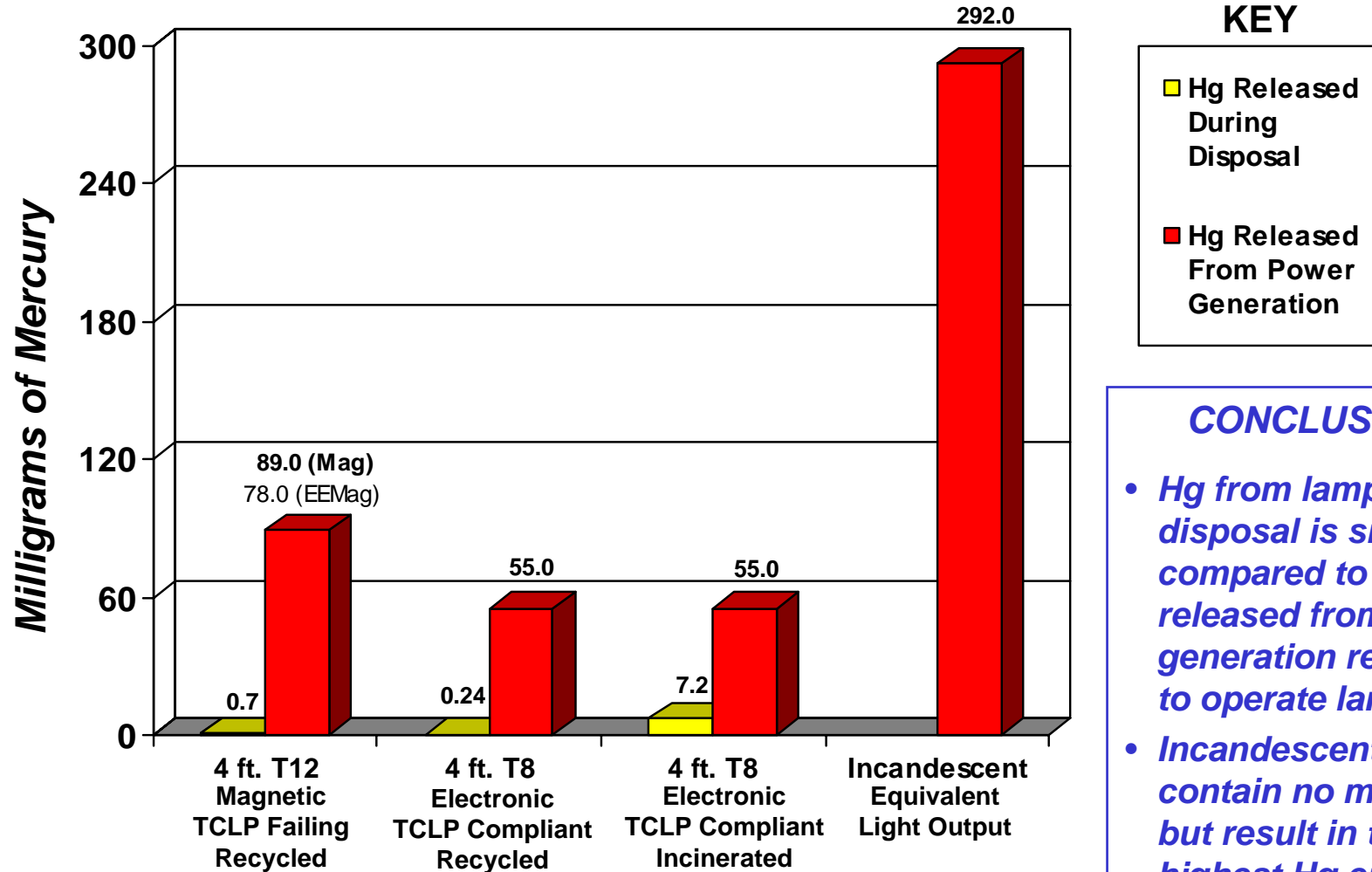
Color, High Power, Efficacy

Efficacy, Shape (Flat Panel)

Low Lumens, Efficacy

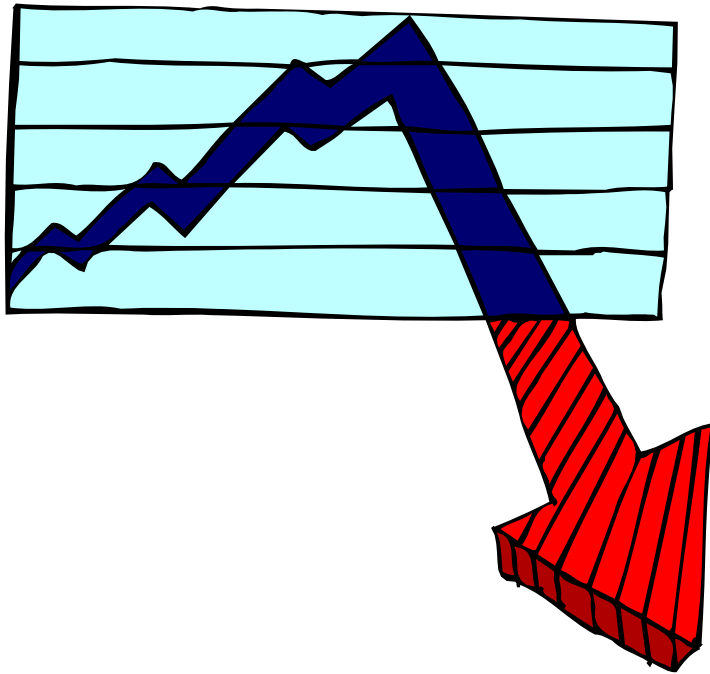
Efficacy, High Voltage

Lifetime Mercury Emissions*



*Based on 20K burning hours, Hg content of 23 mg per T12 lamp, and 8 mg per T8 lamp. Hg content of fuels is the US weighted average for fossil and non-fossil fuels, calculated from "Environmental and Health Aspects of Lighting: Mercury" J.IES 1994. Disposal emissions assume 3% in residuals of recycling, 90% from incinerators.

Lamp Industry Reaction



Since 1990 - Has reduced mercury in shipments by:

67%

Since 1990 - Has reduced avg. 4-foot mercury dose by:

80%

www.lightfair.com

Lamp Disposal

Quote:

“It is not the use of fluorescent lamps that is the problem, it is their proper disposal.”

Proper disposal in the U.S. depends on:

- Who you are* (e.g., Households exempt)
- Where you are* (e.g., Which State)
- What type of lamp* (e.g., TCLP compliant)
- How many lamps* (e.g., Small quantity exemptions)
- Other wastes* (e.g., Have to be included in the lamp total)

The Lamp industry is unable to give simple advice to users on proper disposal



Lamp & Recycling Industry Outreach

1. Use the internet (e.g., www.lamprecycle.org and www.almr.org)*.
 - Sponsored respectively by NEMA Lamp Manufacturers and Lamp Recyclers
 - Contains State and Federal rules
 - Lists Lamp Recyclers
 - Recommends recycling
2. Wholesaler invoices information
 - Remind businesses of their lamp disposal obligations
 - Required in some States

*almr is the Association of Lighting and Mercury Recyclers



Lamp Recycler/Industry Outreach

3. Utility bill stuffers
 - Remind all users about energy efficient lamps and proper disposal.
4. EPA Recycling Outreach
 - \$2M appropriation resulting from lamp manufacturer “lobbying”.
5. Rebuild America Training Module
 - NEMA/Lamp Recyclers
6. Distributor Programs



Legislative Review

Ric Erdheim

www.lightfair.com



Model State Legislation

- Development of Northeast Model Bill
 - 1998 Mercury Report to Congress and Northeast Mercury Report
 - Municipal Solid Waste incinerators one of largest sources
 - Focus on products
 - Ignored source reduction and incinerator controls
 - 2000 NEWMOA* Model Mercury Legislation

* Northeast Waste Management Officials Association

Model State Legislation

- State/Regional product and package labeling (mercury added product includes luminaires sold with lamp)
- Phase out of products >10 mg with limited exemptions
- Manufacturer responsibility for collection
- Total disposal ban including homeowners, small generators, TCLP-passing lamps

Product and Package Labeling

- State or region specific, not national.
- Adds duplicate inventory **costs** at every point in manufacturing/distribution chain.
- **Not achievable:**
 - Lighting industry does not own or control distribution chain.
 - Cannot ensure labeled products arrive at intended state.
 - Cannot keep labeled products out of states with no labeling or different spent management requirements.
 - Cannot keep unlabeled products out of any state.

www.lightfair.com

Product and Package Labeling

- Lack of educational value – disposal decision makers do not see label.
- Only viable label must be federally mandated and state pre-empted.
- www.nema.org/lampsehs

Product Bans and Exemptions

- **Greater than 1 gm**
e.g., Semiconductor Manufacture, and Movie/TV Location Lighting
- **Greater than 100 mg**
e.g., Major Floodlighting and Sports Facilities
- **Greater than 10 mg**
e.g., Impacts most HID and outdoor fluorescent
- **Two-year exemption provides no regulatory certainty; increases manufacturers' costs and state bureaucracy**

Manufacturer Collection Issues

- Recycling infrastructure exists - creates unnecessary partner in disposal process
- Adds cost to product, based on worst case scenario
- Further widens gap between cost of incandescent and CFL's
- Users can negotiate better deals with recyclers at time of disposal
- Need education on and enforcement of existing system.
- www.nema.org/lampsehs

Total Disposal Bans

- Businesses use 85% of lamps containing 90% of mercury
- High cost and low recovery for households and other small users

State Legislation Maine

- 2000 Legislation
 - Total disposal ban
 - Labeling of some products – lamps excluded
 - Wholesaler information on disposal
- 2002 Legislation
 - Phase out rejected
 - DEP study

State Legislation New Hampshire

- 2002 Bill
 - Labeling and phase out
 - Bill pulled from House floor because of likely defeat
 - Revised Bill contained labeling and advance disposal fee
 - Bill defeated 207-147

State Legislation Vermont

- 1998 Bill
 - Product and package labeling
 - Disposal ban of labeled products
- NEMA Lawsuit
 - District Court finds unconstitutional
 - Appellate Court reverses
 - NEMA petition to U.S. Supreme Court

State Legislation Vermont

- 2002 Bill
 - Total disposal ban
 - Phase out > 100 mg if other states pass similar requirement.
 - Bill passed Senate, but unlikely to pass House and become law.

State Legislation Massachusetts

- 2002 Bill
 - NEWMOA Model
 - Passed Environmental Committee but stalled in Science Committee
 - Unlikely to pass

State Legislation Rhode Island

- 2001 Bill
 - Labeling, but lamps exempted
 - Wholesaler information on disposal
 - Manufacturer collection, but lamps exempted
 - Phase out of lamps with > 10 mg
 - Disposal ban except homeowners
- 2002 Effort to repeal phase out

State Legislation Connecticut

- 2002 Bill
 - Package labeling of lamps
 - Product and package labeling of other products including luminaires sold with lamps
 - Wholesaler information
 - Collection requirement exempts lamps if package includes website and 800 number for recycling information
 - Phase out > 100 mg

State Legislation New York

- 2002 Bill
 - NEWMOA Model
 - Passed committee
 - Needs other committee approval
 - Unlikely to pass

State Legislation New Jersey

- 2002 Mercury Advisory Committee
 - Recommends NEWMOA model
 - No manufacturer participation in the process
 - No bill yet

State Legislation Maryland

- 2001 and 2002 Bills
 - Product and package labeling
 - 2001 Bill passed without labeling.
 - 2002 Labeling Bill defeated in committee.

State Legislation Indiana

- 2001 Bill
 - Included disposal ban.
 - Bill passed without disposal ban.

State Legislation Michigan

- April 2002 Bill
 - Labeling
 - Disposal ban

www.lightfair.com

State Legislation Minnesota

- Early 1990s
 - Labeling but lamps exempted.
 - Wholesaler disposal information.
 - Total disposal ban.
 - State claims 70% lamp recycling rate.

State Legislation Wisconsin

- 2002 Bill Draft
 - NEWMOA model
 - If introduced will be sent to study

State Legislation Washington

- 2002 Bill
 - Labeling
 - Manufacturer collection
 - Total disposal ban
 - Passed committees with disposal ban
 - Did not pass
 - Appropriation requires Dept. of Ecology to develop plan

State Legislation Oregon

- 2001 Oregon Mercury Report
 - Wholesaler inform purchasers.
 - Disposal ban.
 - Manufacturers should share responsibility to increase recycling.
- 2003 Legislative Session

State Legislation California

- 2001 Bill
 - Requires recycling by businesses.
 - Bans disposal in MSW.
- 2002 Bill
 - Requires collection/labeling “hazardous electronics” including lamps.
- Bills passage unlikely.

Legislative Summary

- Labeling
 - Vermont (in litigation)
 - Maine, Rhode Island and Minnesota exempt lamps; require wholesalers information
 - New Hampshire and Maryland reject labels
 - Connecticut requires package labeling for lamps, product and package label for luminaires sold with lamps
- Manufacturer collection
 - No state laws have been enacted for lamps.
 - Connecticut requires lamp collection unless manufacturers have package label with recycling information

Legislative Summary - 2

- Phase Out
 - Rhode Island > 10mg
 - Connecticut > 100mg
 - Maine and New Hampshire reject
- Disposal Ban
 - Total in Minnesota, Maine, Vermont (if labeled)
 - Businesses only in Rhode Island, Connecticut
 - Partial ban in Florida

Legislative Summary - 3

- Mercury legislation considered in 20 states in 2001-2002
- Legislation affecting lamps in 14 states.
- Issue likely to get more attention



Lamp Disposal Update

Barry H. Jordan

www.lightfair.com



Can I Throw My Lamps in the Trash?

- A Legal/Compliance Decision
- Under federal regulations, spent mercury lamps (fluorescents and HID's) are **hazardous waste** UNLESS you have information from manufacturer or test results to prove they are non-hazardous.

Can I Throw My Lamps in the Trash?

- May depend on how many spent lamps you generate each month
- Federal Regulations exempt certain small quantity generators: less than 220 lbs. of hazardous waste per month (not just lamps).

Can I Throw My Lamps in the Trash?

- State agencies are authorized to manage hazardous waste programs.
- State regulations **must be equivalent to**, but are allowed to be **more stringent** than Federal Rules (e.g., no small quantity exemption; mercury disposal bans)

Three Key Compliance Questions

- Does my state follow the Federal small quantity hazardous waste exemption?
- Does my state currently allow solid waste disposal of test-compliant mercury-containing lamps?
- What will my state allow in the future when I remove lamps from service? (Mercury regulations tightening in several states)

Should I Throw My Lamps in the Trash?

- A risk management decision.
- **SUPERFUND Liability**
 - Generators are liable for their wastes!!
 - Liability is
 - STRICT
 - JOINT & SEVERAL
 - NOT LIMITED BY TIME
 - No small quantity exemption under Superfund
 - Liability extends to LEGAL solid waste disposal

It's Your Choice

- If I legally throw lamps in the trash as a small quantity generator, am I liable under Superfund?
 - **YES.**
- If I legally throw “low mercury” lamps in the trash, am I liable under Superfund?
 - **YES.**
- Manufacturers of “low mercury” lamps recommend recycling as preferred disposal method.

What About Recycling and Liability?

- If you send lamps to a “recycler” that ends up causing problems, are you potentially liable?
 - **YES** - if the “recycling” company does not have the financial resources to correct the problems it created.

What About Recycling and Liability?

- That's why, if you decide to recycle, for either COMPLIANCE or RISK MANAGEMENT, remember 2 very wise sayings:
 - “*caveat emptor*” (buyer beware)
 - “*you get what you pay for*”

How Can I Manage Spent Lamps?

- Either as “Hazardous” or “Universal” Waste (except in Maryland - lamps not in Maryland’s Universal Waste Rule)
- Universal Waste = Reduced Requirements
 - Storage (1 year vs. 90 days)
 - Transportation (common carrier vs. hazardous waste transportation.)
 - Paperwork (bill of lading vs. hazardous waste manifest)

How Can I Manage Spent Lamps?

- Some states have adopted the Federal Universal Waste Rule
- Others have made changes to the UW.
- Need to check your state for specifics.
- www.lamprecycle.org provides state links

www.lightfair.com

What's Available?

- The infrastructure already exists!
- Over 75 recycling companies in U.S. - most regional, a few national.
- Some offer transportation and storage.
- Others offer processing and reclamation of some or all lamp components (mercury, glass, aluminum, phosphor powder).

What's Available?

- Large and Small Generators have choices:
 - Contract directly with recycling companies
 - Contract with “third party” companies
 - Waste Brokers
 - Environmental Service companies
 - ESCO's
 - Utilities
 - Lighting Maintenance Companies
 - Distributors

What are the Costs?

- Costs vary based on volumes, locations, project or facility conditions.
- “Bulk” costs for fluorescent lamps \$0.07 - \$0.12 per foot range.
- Convenience “box” service typically costs more.

Where Are We Headed?

- Lamp recycling rate up from 15% in 1997 to nearly 25% in 2002 - EPA goal is to exceed 50% in 5 years.
- Regulations and public scrutiny will continue to increase for mercury bearing wastes, including lamps.
- The “dumpster” will become less and less attractive/allowable.

What Should I Look For in a Recycler?

- Competitive Pricing
- Responsive Service
- Risk Management
 - Total Service
 - Environmental Protection
 - Financial Safeguards
 - Experience

www.lightfair.com

Total Service

Includes:

- Proper packaging
- Labels and shipping documents
- Collection and transportation
- Waste processing
- Waste tracking
- Regulatory advice

www.lightfair.com

Environmental Protection

- State permits
- Regulatory compliance
- Audit information
- Proper destination of lamp components

www.lightfair.com

Financial Safeguards

- Insurance (including pollution liability insurance for sudden and non-sudden occurrences)
- Indemnification
- Facility closure plans (fully-funded and state-approved)
- Strong financials

Experience

- Years in business
- Caliber of employees
- Performance track record
- Customer references

www.lightfair.com



Disposal Summary

- Regulation of mercury lamps will increase
- Recycling rates will increase
- Recycling infrastructure and capacity exists to handle current and projected volumes
- You have many choices to “do the right thing”
- Make sure you get what you pay for

Conclusion

- Most efficient lamps need mercury.
- There can be problems with improper disposal.
- Education and enforcement of existing disposal laws is essential.
- Use the existing lamp recycling infrastructure
- Protect the use and distribution of efficient lamps from ill-advised legislation.
- Be active with your state legislature
 - Trade Associations, Business Alliances, User Groups