

# ***Toxic Substance & Waste Electronics Regulation in the U.S. and Americas***

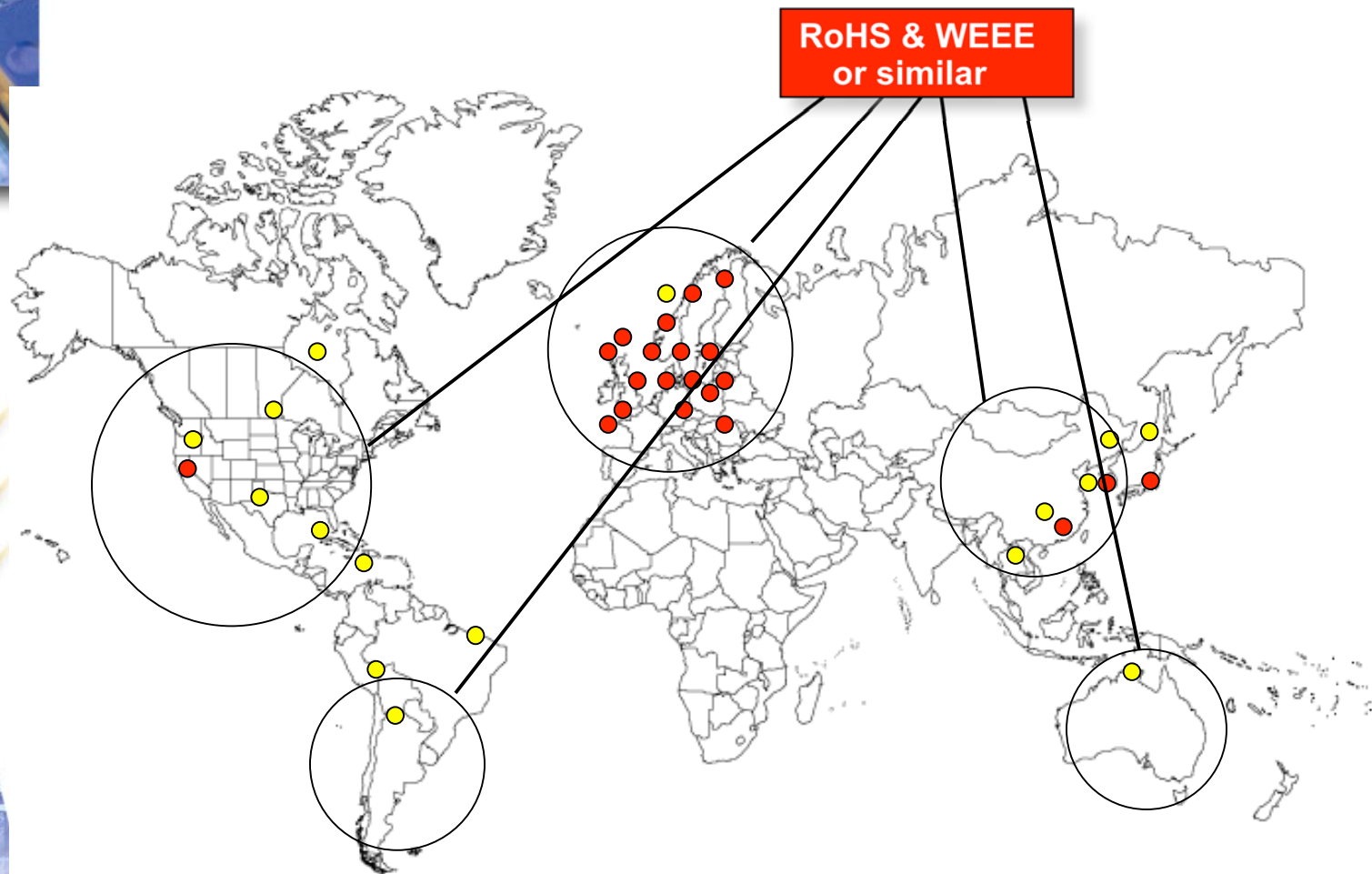
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ELECTRONICS INDUSTRIES

# Environmental Regulations on EEE



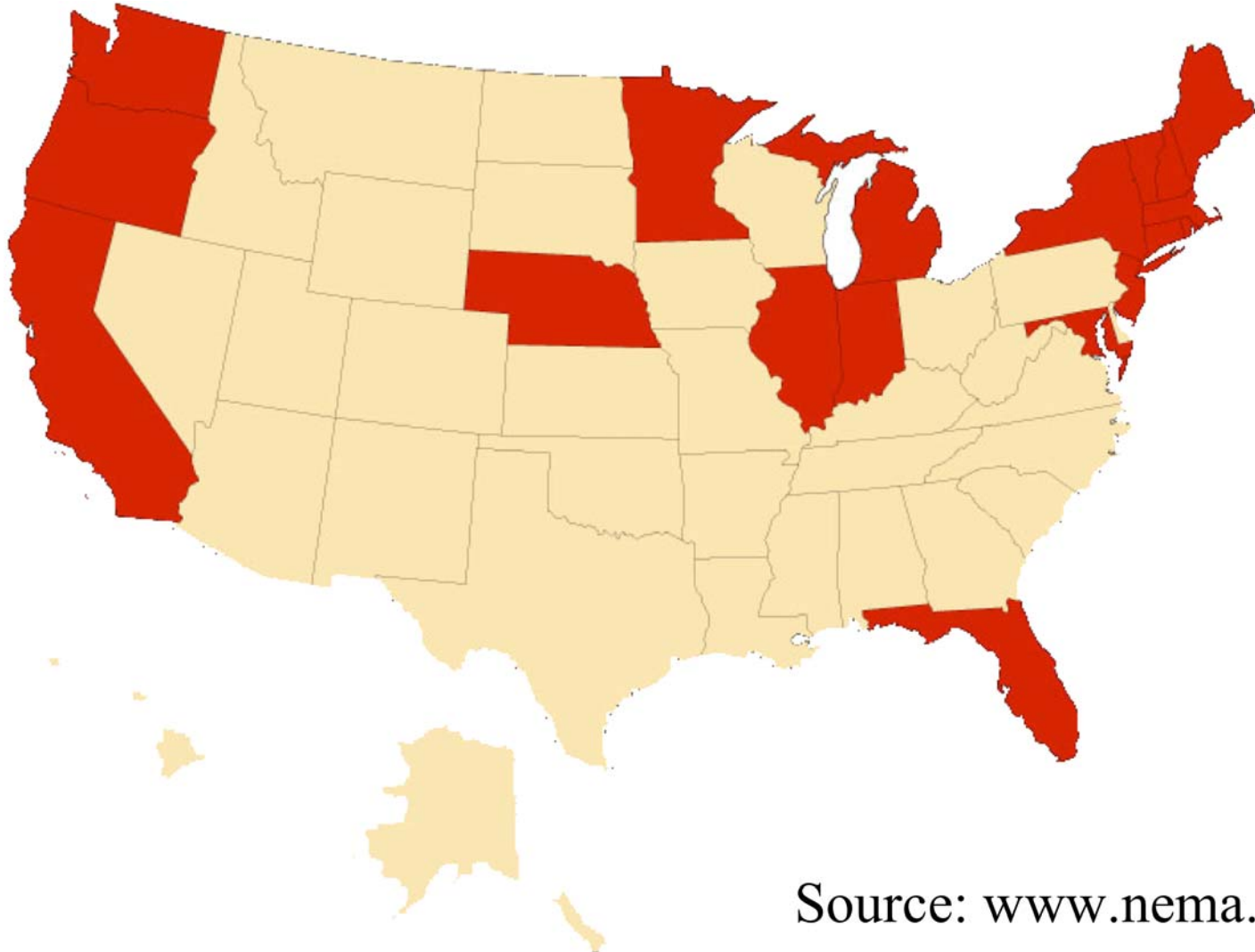
Source: Presentation of German Avila, Synapsis Tecnologia at IPC Works, 2006



# *Restricted Substances Regulations in the U.S.*

- No Federal Regulations
- California is the only state with a full 'RoHS' type program
  - Hg, Cd, Pb, and Cr VI+
  - Does not regulate BFRs
  - Covered device scope currently limited to items with a video display screen >4"
  - Proposal to expand it to include all 8 EU RoHS product categories
  - Jointly implemented with electronics recycling
- States with RoHS type Bills
  - Minnesota, New Jersey, Tennessee, Vermont, Washington, Wisconsin
  - Some tied into electronics recycling bills

# *Existing Mercury Laws*



Source: [www.nema.org](http://www.nema.org)





# *Mercury Regulations*

- California, Connecticut, Illinois, Indiana, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Rhode Island, Vermont, Washington
  - RoHS type
  - Special labeling requirements
  - Notification requirements
  - Bans on use of mercury in switches
  - Some exempt mercury lamps for backlighting from requirements
  - Collection of mercury containing lamps
- Pending Mercury Bills: Louisiana, Massachusetts



# ***BFR Regulation in the U.S.***

- States with current laws
  - California, Maine, Maryland, Michigan, Hawaii, Illinois, New York, Oregon, Washington
- States with Bills
  - Connecticut, Minnesota, Massachusetts, Indiana, Michigan, New Jersey, Rhode Island, Vermont, Wisconsin
- Ban penta and octa PBDE
- Many originally called for a total BFR ban
- Do not limit use of TBBPA

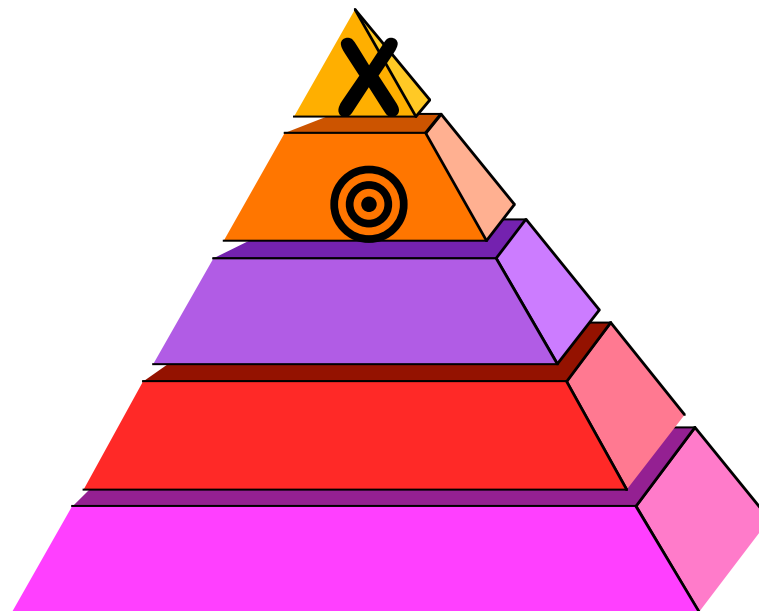


# *Drivers for Removal of BFRs*

- OEMs in Japan and Europe began “environmental friendly” campaigns have moved from “lead-free” to “halogen free”
- Strong Opposition to BFRs by Environmental Groups
- Concern by some stakeholders over environmental impacts and combustion by-products
- Largely perceived as being driven by marketing as opposed to real environmental threat
- OEMs now seeking “halogen-free” solutions/ pushing down their supply chains

# Activist Flame Retardant Deselection Strategy

“The Flame Retardant Pyramid of Problems”



PBB, Penta, Octa

Deca, HBCD, TBBPA

TPP & All BFR's

Phosphorus FR's

Remaining FR's

Adapted from Greenpeace toxic pyramid of plastics

Source: <http://www.greenpeace.org/~comms/pvctoys/reports/loomingfuture7.html>

# ***BFR Use***

	<b>Applications</b>	<b>Health Status</b>	<b>Use Status</b>
<b>PBBs</b>	Rarely found	PBTS, Possible Carcinogens	Banned in US and EU
<b>Octa and Penta BDEs</b>	Rarely found – Octa was used in computer casings	Considered possible endocrine disruptors	Banned in Certain US States and EU by 2006
<b>Deca BDEs</b>	TV and computer casings	No risk to human health or the environment	Not banned but under study in US and EU
<b>TBBPA</b>	Circuit boards and chip casings	No effect on human health; environment study underway	Not banned but under study in Certain EU states



# *Deca BDE Regulation*

- EU RoHS Exemption for Deca-PBDE
  - Commission decision on October 13, 2005
  - Denmark considering legal action (has not filed yet)
  - Sweden considering non-electronics Deca ban
- U.S. States studying Deca Bans
  - Maine, Washington have released initial studies
  - Illinois, Maryland, Massachusetts, Oregon have studies underway



# TBBPA

- USEPA requires TBBPA to be reported per Toxic Release Inventory (TRI)
- Studies underway for alternatives to TBBPA
- EPA Design for Environment (DfE)
  - Program investigating alternatives to TBBPA in printed circuit boards
  - Kickoff meeting held in February



# Assessment of Alternatives

- Lifecycle impacts are key!
  - Design, Use, and End-of-Life
- Is alternative better for environment?
- Can it meet same functionality requirements?
- Will it decrease product safety or reliability?
- What are the tradeoffs?



# *Design for the Environment Program*

- Industry need for information on flame retardants
- Collaborative partnership between EPA, Industry leaders, Trade associations, and Public interest groups
- Non-Regulatory



# *Flame Retardants in Printed Circuit Boards*

- Goal: To identify and characterize commercially available flame retardants and their environmental, health, safety and environmental fate aspects in FR-4 printed circuit boards
- Apply life-cycle thinking to consider hazards and exposures
- Use EPA New Chemicals Program criteria to evaluate hazard and environmental fate concerns



# *Complimentary Projects*

- iNEMI (International Electronics Manufacturing Initiative)
  - Testing electrical and mechanical properties of commercially available halogen-free laminates
- HDPUG (High Density Packaging User Group)
  - Assembling a comprehensive Halogen-free Guideline.
  - Creating a database with performance and environmental information on halogen-free laminates and components



## ***U.S. – WEEE Type***

- States with programs/regulations
  - California
  - Maine
  - Maryland
  - **New** Washington HB 2662/SB 6428 producer responsibility



## ***U.S. – WEEE Type***

- Twenty-one states with bills this year  
California, Delaware, Hawaii, Iowa, Illinois, Kentucky, Massachusetts, Michigan, Minnesota, Mississippi, North Carolina, Nebraska, New Hampshire, New Jersey, New Mexico, New York, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Vermont, Washington, Wisconsin



# ***U.S. – WEEE Type***

- **Financial Responsibility**
  - Manufacturers responsible for all costs associated with collection, transportation, and recycling of covered electronic products their return share of covered electronic products
  - No fee collection
  - Point of sale fee
  - Manufacturer paid advanced recycling fee (ARF)



## ***U.S. – WEEE Type***

- **Scope**  
Product scope includes computers, computer monitors, laptops & televisions generated by a household, charity, school district, small business, & small government



## ***U.S. Harmonization?***

- Are Federal regulations needed to stop state by state regulations?
- Can industry come to a single position?
- Will Federal laws preempt state laws?
- Are we opening Pandora's Box?
- Who will be in control of the legislative process?
- What about the rest of the world?



# ***RoHS/WEEE in North America***

- Mexico and Canada updating hazardous waste laws to include WEEE
- Canada loosening import/export laws on viable WEEE recyclables
- Some Canadian provinces regulating WEEE
- Mexico – continued research on electronic waste impact



# *RoHS/WEEE in Latin America*

- MERCOSUR (Brazil, Argentina, Paraguay, Uruguay) proposed “Policy on Environmental Management of Wastes and Post-Consumer responsibility” for electronics waste management
- Brazil RoHS legislation proposed
- Colombia – Hazardous Waste
- Costa Rica – draft electronic waste regulation focusing on computers, printing accessories, photocopiers, scanners, digital cameras, cellular telephones and batteries, and fluorescent lamps.

# Thanks

Thanks to EIA for many of the state related information

Questions?

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