



INEMI[®]

International Electronics Manufacturing Initiative

Future Initiatives for Sustainability

Grace O'Malley

Bob Pfahl

Advancing manufacturing technology

Outline

- **Introduction**
- **Materials**
- **Energy**
- **Recycling/Reuse**
- **Eco-Design**
- **Sustainability**
- **Plan for Action**
- **Conclusions**

Who Are We?

- **iNEMI organization:**
 - Corporate membership
 - Not-for-profit, R&D consortium
 - Collaboration defined by organization by-laws, intellectual property policy, and project agreements.
- **Member companies/organizations:**
 - Leadership OEM, EMS, and Supplier companies
 - Government labs
 - Academic Institutions.
- **Small staff provides services to facilitate global collaboration (USA, Asia & Europe):**
 - Support to help organize & manage projects
 - Communication services for collaboration
 - Manage Relationships with other Organizations.



OEM/EMS Members



Agilent Technologies



Alcatel-Lucent

Boston Scientific

Delivering what's next.™



Celestica™

DELPHI

FOXCONN®

FLEXTRONICS



HUAWEI



i n v e n t



MOTOROLA

JABIL



PLEXUS®

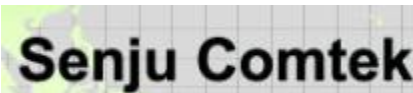


INEMI®

Supplier Members



Ciba



Association/Consortium, Government, Consultant & University Members



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES®



NIST

National Institute of Standards and Technology



Deliverables

“Advancing Manufacturing Technology”

iNEMI provides five important deliverables:

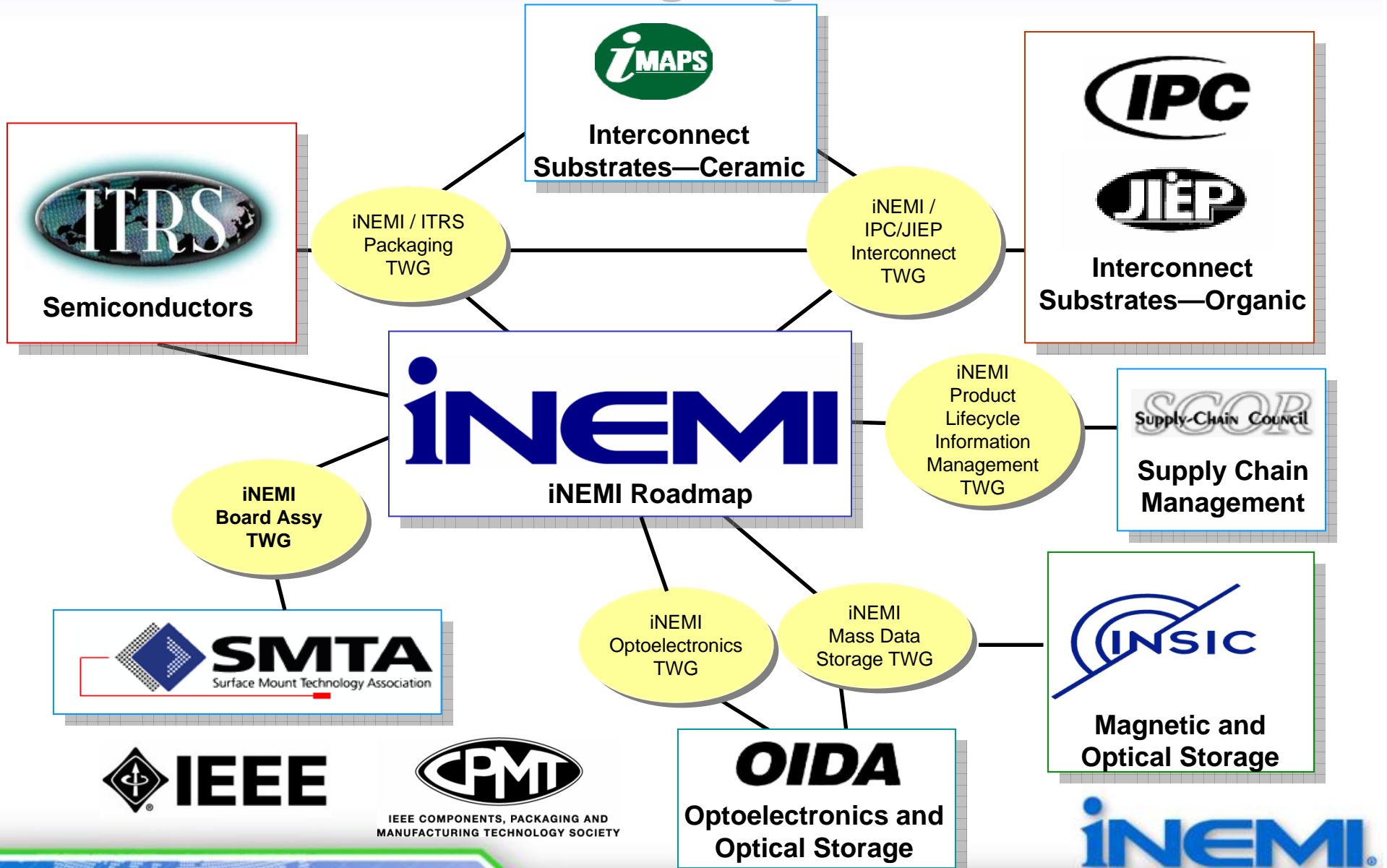
- 1. Technology roadmaps**
- 2. Technology deployment projects**
- 3. Research priorities**
- 4. Forums on key industry issues**
- 5. Position papers to focus industry direction**

Statistics for the 2007 Roadmap

- **> 560 Participants (open to all industry)**
- **> 265 Companies/organizations**
- **17 Countries from 4 Continents**
- **19 Technology Working Groups (TWGs) (added Organic & Printed Electronics)**
- **5 Product Emulator Groups (PEGs)**
- **Over 1300 Pages of Information**
- **Roadmaps the needs for 2007-2017**
- **> 100 Research Needs Identified**
- **>150 Technical Gaps Identified**



9 Contributing Organizations



2009 Environmentally Conscious Electronics (ECE) Roadmap

Five Chapters

- **Materials** **Holly Evans, Strategic Counsel, LLC**
- **Energy** **Valerie Rickman, ITI**
- **Recycling-Reuse** **Jason Linnell, National Center for Electronic Recycling**
- **Eco-Design** **Cliff Bast, Acer, Inc.**
- **Sustainability** **Markus Stutz, Dell**



iNEMI[®]

International Electronics Manufacturing Initiative

Materials

Advancing manufacturing technology

Materials

Short Term Needs - Identified in 2007 Roadmap

- **Proactive programs to convert to bromine flame retardant (BFR) free material alternatives**
- **A strategy and action plan to facilitate low risk conversion of high-reliability applications to Pb-Free solders**

Proactive BFR Free Activities

- **US EPA Design for Environment Program: Alternatives Assessment of Flame Retardants for the Electronics Industry**
 - EHS assessment
- **iNEMI BFR-Free PCB Project**
 - Technical evaluation of key electrical and mechanical properties
- **iNEMI BFR-Free High-Reliability PCB Project**
- **Intel-iNEMI Symposium on Environmentally Friendly Materials**
 - November 11-12, Shanghai, China

Pb-Free Conversion by Segment

Industry Segment	Status
Portable / Consumer	Full global conversion to Pb-free. Working improvements to mechanical shock.
Office Systems / Large Business / Communication Systems	Most have taken Pb exemption for mission critical electronics. Working to close Pb-free knowledge gaps.
Medical Products	Either out of scope or have taken Pb exemption.
Automotive	Mission critical electronics still using SnPb. Entertainment/communication systems moving to Pb-free.
Defense and Aerospace	Either out of scope or have taken Pb exemption. Working to ensure ongoing availability of SnPb components.

- The components supply chain is rapidly converting to RoHS compliant offerings (Pb-free) with little motivation to continue to produce SnPb product.
- Taking the Pb exemption has changed the risk profile for High Reliability producers.

Materials

Recommendations

- **Need for development and implementation of good scientific methodologies to assess true environmental impacts of materials and potential trade-offs of alternatives**
- **Greater involvement of industry on policy making for material and energy restrictions to assure better understanding of trade-offs inherent in substitutions**



iNEMI[®]

International Electronics Manufacturing Initiative

Energy

Advancing manufacturing technology


Energy: Even Americans are Concerned

It pays for businesses to "go green"

Protecting the environment is not only good for the planet—it's also good for business. When you make smarter choices that minimize toxins, lower your power and cooling costs, and bring your organization into compliance with regulatory standards, your company can boast about being a good corporate citizen while simultaneously reducing ongoing expenses in the datacenter. Call PC Mall for expert advice on minimizing your company's environmental impact while maximizing its bottom line.

PC Mall Great technology! Great advice! Great prices!
1.877.233.0516 pcmall.com

Lower datacenter costs with IBM BladeCenter HS21



IBM

- Offers higher efficiency than rack servers with power savings of up to 35%
- Solid state hard drives use up to 87% less power and generate less heat than mechanical hard drives
- Integrated 10Gb Ethernet switches can be more than 95% more energy efficient than external switches
- Low-power processor options
- Optimizes air intake, fan placement and zone cooling to maximize airflow and lower datacenter costs

starting at **\$1299** #7506318

521 Wireless Express Access Point

This single-band 802.11b/g access point with antenna has a maximum power draw of only 9.9 Watts.

We're now Cisco Gold Certified!
Call for details on this exciting new release.

APC Back-UPS ES

Offers advanced charging technologies that are up to five times more efficient than comparative UPS solutions and allows you to conserve energy further by automatically shutting down unused peripherals.

only **\$323⁹⁹** #7251012

only **\$92⁹⁹** #7371005

Infrastructure Standard High Availability Acceleration Kit

only **\$6039⁹⁹** #7356558

Phaser 6180/N Color Laser Printer

~~\$999~~ **\$799** #7201694
Price after \$200 instant rebate. Print before rebate is \$999. Ends 8/31/08.

Essential Surge Arrest 7RCPTL with TEL 120

only **\$22⁹⁹** #7432826

MENTION CODE: PCMAGAZINE Notebooks | Desktops | Servers | Networking | Apple Systems | Storage



Additional PC Mall Services:
Easy Leasing Program,
Extended Service Plans,
Software Licensing Programs,
Employee Purchase Programs,
CAP Sites, Design Services,
Imaging and Replication,
Asset Tagging and More.

Go to pcmall.com to sign up for our e-mail subscriptions!


Lenovo takes an active role in combating climate change

lenovo

Lenovo is committed to providing environmentally responsible, energy-efficient technology choices. In 2007, they joined the Board of Climate Savers Computing to support their efforts in reducing CO₂ emissions related to IT by 50% by 2010.

Lenovo helps you save money while meeting your energy goals

Choose Lenovo systems from these cutting-edge series and you'll meet both ENERGY STAR® and EPEAT Gold standards.

SMBs	Large Enterprises
 ThinkCentre A61e Desktops Full size performance at a low price point in an energy-efficient and whisper-quiet design. starting at \$399 #7299022	 ThinkPad X300 Notebooks The thinnest, lightest and most power savvy Lenovo notebook. starting at \$2799 #7386775
 ThinkCentre M57p Desktops The most energy efficient model in the ThinkCentre family. starting at \$936 #7304200	



Lenovo's green strategies include:

- All Lenovo ThinkPad notebooks, ThinkVision monitors and many ThinkCentre products launched from 2008 are ENERGY STAR® 4.0 compliant and deliver up to 70% energy efficiency improvements.
- Lenovo systems with EPEAT Gold ratings contain up to 90% reusable and recyclable materials and ship in packaging that is 90% recyclable.
- Lenovo Power Manager and BatteryStretch technologies offer adjustable power management.

All Lenovo LCDs launched from 2008 are ENERGY STAR 4.0 and EPEAT Gold certified.

EcoSmart™

The Targus EcoSmart™ family of products is PVC-free and features recyclable plastic accents and nickel-free metals that help reduce the amount of toxins released into our environment.

#7323404		\$55⁹⁹	#7323403		\$55⁹⁹
#7323404	Grove Topload Notebook Case	\$49⁹⁹	#7323401	Grove Convertible Messenger/Backpack	\$74⁹⁹

ThinkVision L171p 17" Flat-Panel LCD

only **\$249⁹⁹** #7182947

ThinkVision L183P 19" Flat-Panel LCD

only **\$299⁹⁹** #7351173

ThinkVision L220X 22" Flat-Panel LCD

only **\$499⁹⁹** #7348645

Media | Printers | Scanners | Projectors | Cameras | Displays | Software 1.877.233.0516 pcmall.com

Energy

Situation Analysis

- Energy Costs Impacting End User
- Regulations impacting technology choices
- Energy Management
 - Reducing Energy Use in Computer Centers is a new Market Opportunity

Needs

- More efficient power supply technology
- World-wide harmonized energy management standard
- New innovative energy sources



INEMI[®]

International Electronics Manufacturing Initiative

**Recycling-
Reuse**

Advancing manufacturing technology

Recycling-Reuse

Short Term

- **Increase communication and cooperation within the global industry regarding recycling challenges**
 - **Contaminants**
 - **Regulations that restrict recycling**
 - **Cost efficiency**
- **Develop joint industry initiatives that solve compliance challenges across multiple jurisdictions.**
- **Develop harmonized systems to collect, transport and process used electronics.**

Recycling-Reuse

On Going

- **Reduce recycling volume through increased life and dematerialization of products**

Long Term

- **Increased use of recycled content from previous generation products**



iNEMI[®]

International Electronics Manufacturing Initiative

Eco-Design

Advancing manufacturing technology

Gaps in the Understanding of Eco-Design

- Limited understanding of design process and cycle time by eco-label, standards, and regulatory stakeholders.
- Stakeholders must allow for and consider new technologies, life-cycle thinking and scientific when defining new Eco-Design Criteria.

Design determines market success

Growth of Firms and Industry needs a strategic approach to Eco-Design



Harmonization of Eco-Design Systems

- **Eco-Design Standards**
 - Existing ICT/CE Vertical IEC Standard 62075
 - New Horizontal “Environmental Conscious Design” IEC Standard 62430
 - Process for updating standards for new regulations: EUP, REACH
- **Environmental Procurement Tools**
 - EPEAT a North American based procurement tool for computers and monitors
- **Eco Certification and Labeling**
 - Energy Star
 - TCO
 - Blue Angel



iNEMI[®]

International Electronics Manufacturing Initiative

Sustainability

Advancing manufacturing technology

Sustainability Requires Balancing Competing Objectives

Environmental Regulations do not always lead to sustainability

- **Legislating the use of corn based ethanol in automobile fuels without considering environmental and economic impact**
- **Legislating the use of Compact Fluorescent Lamps without requiring the development of a recycling infrastructure for the mercury in the lamps.**

Sustainability

Electronics as solution to climate change

- Smart city planning
- Smart buildings
- Smart appliances
- Dematerialization
- Smart industry
- I-optimization
- Smart grid
- Integrated renewables
- Smart work
- Intelligent transport

Potential Impact: Reduction of 1 billion tons of Green House Gas emissions.



iNEMI Sustainability Summit

“The electronics industry must develop a strategic vision of sustainable electronics” iNEMI Board of Directors

- **iNEMI Sustainability Summit, September 22-23,2008 at Motorola, Schaumburg, Illinois, USA**
 - The motivation for the workshop is a recognition that the electronics industry should act strategically on environmental issues.
- **The goals of the workshop, breakout groups and action groups are to:**
 - Evaluate opportunities for industry collaboration on proactive environmental programs
 - Define academic research needs to support these programs
 - Stimulate funding for the necessary research
 - Form and execute the required industrial collaborative program
- **Speakers Represent:**
 - Intel, Cisco, Motorola, Alcatel-Lucent, Rohm and Hass; Purdue University, Arizona State University, Clean Production Action





iNEMI[®]

International Electronics Manufacturing Initiative

Conclusions

Advancing manufacturing technology

Concluding Thoughts

- **New environmental requirements continue to multiply – faster than industry can effectively respond.**
- **Industry needs to be more proactive in developing solutions that:**
 - **Are based on science and engineering**
 - **Are available in advance of new regulations**
 - **Can influence future regulations for a better environmental impact**
- **iNEMI and its members plans to play a significant role in preparing industry for these future needs.**
- **Sustainability will be a major undertaking for industry as well as society.**
- **Electronic solutions can help to empower people to live a more sustainable lifestyle.**

www.inemi.org

Email contacts:

Bob Pfahl

bob.pfahl@inemi.org

Grace O'Malley-Europe

gomalley@inemi.org

INEMI[®]
Advancing manufacturing technology

