

Electronic Waste: Our Problem and What We Should Do About It



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E-Waste Defined

- Discarded electronics: old computers, cell phones, other electronics.
- Driven by unquenchable consumption in Western Society
- Consumption has diminished our natural resources.
- Brought about environmental degradation because of one-way system of production, consumption and disposal.
- Much is discarded in landfills or ground up into scrap.
- We dump much electronic waste on the shores of our world neighbors, which is a questionable practice.

The current wasteful paradigm

- 3 billion electronic products are owned by Americans.
- When new products are purchased, approximately 2/3 of those replaced are in working order.
- Only a small percentage of these materials are recycled; most are ground up for scrap.
- A large percent our electronic waste is sent to developing nations.
- Electronic waste generated by developing nations will soon exceed that of the industrialized nations. (Eric Williams, Arizona State)
- We consume twice as many goods as we did 50 years ago when happiness was at its peak. (Talor and Tilford, 2000, McKibben 2007)

The current wasteful paradigm



everydaypollution.wordpress.com

<http://www.greenpeace.org>



The problem



http://www.time.com/time/photogallery/0,29307,1870162_1822148,00.html



7/2/2005-Taizhou, Zheijang Provice, china
Sturartislett.photoshelter.com



www.gscouncil.org



Photographs by Jose Azel/Aurora

<http://greenlifsmartlife.files.wordpress.com>



Wasted Resources

- Printed circuit boards contain toxic materials: Antimony, Silver, Chromium, Zinc, Lead, Tin and Copper
- Show up in the environment & products; now at the molecular level (*Chasing Molecules* by Elizabeth Grossman).
- Expensive to mine raw materials; environmentally damaging
- Ethical concerns:
 - dump our waste on others
 - conflict metals (tin and tantalum from Democratic Rep. of Congo) for printed circuit boards, assemblies in Playstations, TV's, computers and other appliances.
(ConflictMetals.org)



Simpler Times



Google images: 1950's Radio and TV repair accessed 9/11/11.

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1950's



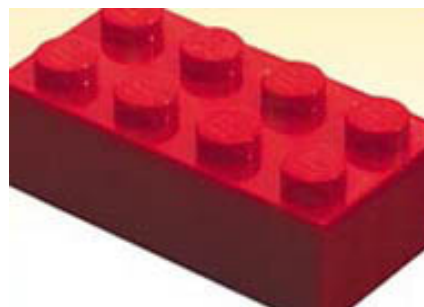
futuresantiques.com: accessed 08.13.12



sciencephoto.com



speedwaymotors.com: accessed 08.13.12



1950's music .com

My profession is part of the problem

- We create attractively styled products
- We contribute to planned obsolescence
- We promote a throw-away mentality
- We should be part of the solution



<http://www.letsgodigital.org/en/15481/sandisk-extreme-ducati-drive>



<http://www.niot.net/blog-images>



http://images.businessweek.com/ss/05/12/ferrari_design/source/6.htm

The current paradigm is not sustainable

- Our existing electronics manufacturing and consumption is not sustainable over time.
- The existing system is based on cheap oil.
- Our manufacturing system is not sustainable over time
- A new model based on sustainable manufacturing and consumption is needed.
- A closed loop system is needed that minimizes or eliminates the concept of waste entirely.
- Experts in business, engineering, design and others must work together to innovated new sustainable solutions.

Opportunity

- For every 1000 tons of e-waste land filled, 0 jobs created
- For every 1000 tons of e-waste recycled, 15 jobs are created
- For every 1000 tons of e-waste repaired, 200 jobs are created

(Illinois Department of Economic Opportunity, 2005)

- What would happen if we used electronics 10 times longer?
20 times?
100?
Forever?...
- We need a new less wasteful paradigm...

What should we do?

- Become better informed; educate ourselves
- Support electronic waste policy; laws and regulations
- Make informed decisions in our purchases
- Make sustainable wise purchases
- Quality matters
- Longevity is important
- Recycle responsibly
- Support research and education programs

Transform Education

- Create new sustainable business models; new manufacturing and delivery systems needed.
- How?
 - Integrating sustainability into university curricula
 - Industrial design, engineering, computer science, etc.
 - Public education/outreach/raising awareness
- Transform product design
- Product stewardship/extended producer responsibility
- Transform consumer and corporate behavior
- Support the Sustainable Electronics Initiative; others.

Innovate to change

- Create new sustainable business models; new manufacturing and delivery systems needed.
- Sustainable Electronics Initiative partnership

“The Sustainable Electronics Initiative (SEI) is a consortium dedicated to the development and implementation of a more sustainable system for designing, producing, remanufacturing, and recycling electronic devices.”

Product Innovation Research Lab (PIRL) Design for Energy and Environment (DEE Lab)



PIRL/DEE Lab

- Research product development problems for industry
- Design, business and technology resources are linked
- Research and education are merged
- Cross-functional faculty and student research teams
- Technical engineering skills + customer driven disciplines of design and marketing
- Investigate real world problems

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Innovation



Innovation

- Research product development problems for industry
- Link design, business and technology resources
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- Investigate real world problems

Benefits to Education

- Experience working on real industry problems
- Access to industry experts and resources
- Collaborative learning opportunities
- Leadership opportunities
- Objective viewpoint; varied solutions
- Employment opportunities
- Build synergistic relationships

Benefits to Industry

- Collaborative teams investigate problems from a customer/user needs perspective
- Access to UIUC experts and resources
- Employee enrichment
- Leading edge ideas and findings
- Objective viewpoint; varied solutions
- Cost effective research deliverables
- Return on investment

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SEI

- Joy Scrogum, Emerging Technologies Resource Specialist
- Recent initiatives