



8 February 2009

Meghan Housewright and Shimere A. Williams, Ph.D.
House Science and Technology Committee
2319 Rayburn House Office Building

Re: Feb. 11 testimony before House Science and Technology Committee regarding e-waste research

Dear Ms. Williams and Housewright:

Thank you for your invitation to testify before the committee. Below is a slightly expanded version of what I intend to say in the hearing and comments on the proposed bill dated Feb. 6. Also, attached is a research paper that Green Electronics Council recently completed for EPA regarding e-waste. Please enter this letter and the attached paper as my written testimony.

Again, thanks for this opportunity to testify before the committee and to comment on the bill.

Sincerely,

A handwritten signature in black ink that reads "Jeff Omelchuck".

Jeff Omelchuck
Executive Director



Testimony for the House Science and Technology Committee regarding E-waste

Recycling the huge amount of legacy electronics that have already been produced is a critical environmental issue. A good e-waste system would keep the environmentally sensitive materials in electronics out of our landfills, groundwater, and air and would allow us to recover and re-use many of the valuable materials. In addition, it must prevent the export of American e-waste to countries and places that cannot, or do not, recycle it properly. There are many ways that the development of an effective national electronics system would benefit from further research. We strongly support the proposed "Electronic Waste Research and Development Act" and the creation of a national e-waste recycling system. Below we present some research and thinking about e-waste recycling and suggest some areas needing further research.

Research suggests that over 80% of the environmental impacts associated with Information and Communications Technology (ICT) occur during the manufacture of the product¹. Much of this impact stems from the electricity, fossil fuels, chemicals, and water used to make semiconductors, printed circuit boards, and other components. While recycling recovers some of the material contained in the product, none of these indirect materials or energy can be recovered. This suggests that one of the best ways to reduce the environmental impacts associated with electronics is to amortize the high impact of manufacturing them over a longer use life. Thus, **it is critical that an e-waste "recycling system" encourage product and component re-use.**

While product design clearly affects recycleability, the reverse is not true. Electronic products are not designed for optimal End-of-Life (EOL) outcomes. Further, if there were comprehensive Design for EOL (DfEOL) guidelines it is not clear why manufacturers would follow them. While most recycling systems charge manufacturers a fee based on their market share or "collection share"², it doesn't make environmental or economic sense to actually return each manufacturer's products to them or process them separately. Because of this, individual manufacturers have no incentive to make their products more easily or efficiently recycled. In fact, many of the innovations that any one manufacturer might make to improve recycleability (use of unique materials, novel connectors, dis-assembly methods, etc.) have the potential to actually reduce the overall recycleability of the common waste stream. **Innovation by individual manufacturers has not and will not improve product recycleability. Collective collection and recycling argues for common product DfEOL standards.**

Enforcing a common DfEOL standard via regulation would be very difficult, and once enacted it would be very slow to evolve in this fast-moving industry. However, electronics manufacturers are very good at listening to and meeting the needs of their customers. **An eco-label or "green purchasing system" that carries substantial market demand is the most practical and responsive way to implement a common DfEOL standard and is a necessary component of an e-waste solution.**

With EPA and the Federal government's help, in two and a half years EPEAT has become the most influential green purchasing system for electronics on the planet. EPEAT registration is now required on over \$60 billion of IT purchase contracts from the U.S. federal government, the Canadian federal government, many states and provinces, and a growing list of international

¹ E. Williams (2002), "The 1.7 Kg Microchip"

² Including the EU WEEE system, China's system, and the systems of the US States that have implemented e-waste recycling programs.

businesses and public agencies. **EPEAT's DfEOL and other criteria are clearly affecting the design practices of IT manufacturers globally.**

EPEAT was developed by and for institutional purchasers – organizations that buy computers on purchase contracts. Retail consumers represent approximately 40% of the market for laptops, desktops, and monitors yet EPEAT is not known or used by consumers. In addition, stakeholders have begun the process of developing EPEAT standards for other electronic product types with substantial consumer markets. If EPEAT is to be an effective tool for improving the recycling outcomes for consumer electronics then consumers must place a purchasing preference on EPEAT registered products, as the U.S. government does. **Building consumer awareness of the importance of e-waste recycling and of buying products that are optimized for efficient recycling will require market research and likely public investment.**

Recent research conducted by GEC et al. and sponsored by EPA³ shows that E-waste recycling technologies and practices vary considerably within the U.S., ranging from manual deep dis-assembly and materials sorting to whole product shredding. In addition, it appears that different types of electronic products are more efficiently recycled in different manners. Therefore, the DfEOL criteria may be different for different types of products that should be recycled in different ways. **Further research is needed to refine DfEOL criteria.**

The research report also describes a pilot project sponsored by GEC and the National Center for Electronics Recycling to create a "Close the Loop Registry" of recycleability information for many electronic products. **Further research and support for piloting and implementing this DfEOL registry are needed.**

Finally, research suggests that a significant amount of e-waste is caused by software driven hardware obsolescence. It is clear that the commercial models of both the software and hardware industries have no clear incentive to prevent or reduce this. **Further research is needed to determine if there are ways to change software and hardware product design practices, or the commercial incentives of these industries, to reduce material and energy churn without damaging the innovation and competitiveness of the industry.**

³ Rifer et al (2009), "Closing the Loop: Electronics Design to Enhance Re-use/Recycling Value", attached as written testimony

Comments on proposed “Electronic Waste Research and Development Act”

The primary reason that the U.S. does not have a comprehensive e-waste recycling program is disagreement between manufacturers as to how such a system would be funded. Each manufacturer has opposed a system whose funding would put them at a competitive disadvantage with respect to their competitors. As a result, each possible system is opposed by one or more powerful manufacturers and the result is no system. The proposed act would do little to solve this fundamental problem. We recommend that the research supported under the act include research into possible funding models and how to reduce or eliminate competitive inequities that prevent forward motion.