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New Blueprint for Streamlining E-waste Processing

Report lays out strategy for 'Closing the Loop' between product design and recycling

Portland, OR: Coinciding with the Science and Technology Committee of the U.S. House of Representatives' approval last week of HR 1580 - The Electronic Waste Research and Development Act, the Green Electronics Council (GEC) has released a report that outlines clear steps to "close the loop" between the design of electronic products and their efficient end of life management.

The report, *Closing the Loop: Product Design to Enhance Reuse/Recycling Value* (available at www.greenelectronicscouncil.org/pages/resources) is based on extensive interviews with electronics recyclers, and identifies several important research priorities to increase the cost effectiveness and resource efficiency of e-scrap recycling. The findings provide an excellent starting point for the research on improved product design for end of life that HR1580 is designed to support.

"The goal of the Closing the Loop research was to identify design and communications strategies that could increase the efficiency of end-of-life management of scrap electronics and as a result, increase market value, reuse opportunities, and resource conservation options," said Wayne Rifer of the Green Electronics Council, principal investigator. "Implementation of the report's findings could significantly lessen the environmental footprint of electronic products."

The research and report were conducted in cooperation with the National Center for Electronics Recycling (NCER) and E-Scrap News and funded through a Cooperative Agreement with the U.S. Environmental Protection Agency, OSWER Innovations Pilot Projects.

Findings "Closing the Loop" researchers interviewed and received input from dozens of electronics recyclers and refurbishers on recommended changes to electronic product design and on the information they needed from manufacturers to improve processing of used devices. The report points to several key changes to enhance end-of-life (EOL) value recovery and process efficiency, based on the general consensus of electronics refurbishers and recyclers interviewed:

- **Enhanced Communications Tools** Establishment of accessible databases, standardized product ID codes, bar coding, or RFID technology could enable EOL managers to capture critical data on product age, power and functionality, and internal components.
- **Product Lifecycle Extension** Design for greater durability and reuse could extend electronic products' useful life and reduce their environmental impact
- **Addressing/Eliminating hazardous substances** Design changes to eliminate hazardous substances where possible and enable identification and removal of components containing hazardous materials will increase worker safety and reduce environmental impacts of waste
- **Enhancement of materials separation** through design focused on reducing the number of resins used and eliminating laminated, bonded, glued, and/or molded-together dissimilar materials allows for more efficient separation and recovery of materials

The report strongly recommends the development of a "Close the Loop Registry" -- a web-based centralized access point for product information that will serve EOL managers who need information about the attributes of particular products (such the location and number of screws and fasteners, location of hazardous substances, information on identification and separation of plastics). By providing

searchable information on a broad array of electronic products, such a registry will enable EOL managers to accomplish effective, safe and efficient breakdown and recycling without delays caused by the need to ask manufacturers for product specifics. The researchers developed a prototype web-based information resource, together with a draft business plan and recommend further development, testing and implementation of the Registry.

The CTL researchers also looked closely at the bifurcated flow of EOL electronics emerging globally -- either to large-scale whole unit processing (shredding) operations or to manual disassembly -- and identified two design-for-end-of-life scenarios which would, early in product development, suit products either to disassembly or to shredding for materials recovery at end of life. These design standards are intended to maximize the environmental benefits relative to resource use and conservation and environmentally safe EOL management. Further research into ways to support the two-scenario approach to product design through purchasing specifications and design standards, is called for.

Next Steps: The report findings will be brought to the marketplace in several ways.

- The research team will provide the Close the Loop product design recommendations to congressional staff and House Members working on HR 1580 The Electronic Waste Research and Development Act.
- The findings will also be distributed to ecolabel and environmental standards organizations, and in particular to the stakeholder participants in the EPEAT system – today's most expansive and influential electronic product rating system (www.epeat.net) . With these findings in hand, EPEAT stakeholders and others involved in ecolabel development can ensure that their criteria support the most effective approaches to environmentally sound, efficient end-of-life management.
- The report's authors also call upon industry groups focused on technical standards development to embody environmentally sound attributes in such standards. For example, harmonization of power supply standards to support designs that could be reused for a variety of devices, (as supported by recyclers and refurbishers interviewed for the Close the Loop report) could increase reuse of power supplies and significantly reduce their lifetime environmental impact.

As policymakers begin to focus on the e-waste issue, as purchasers increasingly turn to tools like EPEAT to ensure selection of environmentally preferable products, and as electronics manufacturers "green" their products, the Close the Loop recommendations offer useful and timely insights into what it will take on the ground to improve rates and effectiveness of electronics recycling and reuse.

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About the Green Electronics Council (GEC): GEC is a nonprofit organization created to inspire and support the effective design, manufacture, use and recovery of electronic products to contribute to a healthy, fair and prosperous world. It assembles teams of professionals for research projects. For the Close the Loop research, GEC was assisted by Eco Stewardship Strategies and Gracestone, Inc., research firms specializing in standards development processes and electronics end-of-life issues.

About the National Center for Electronics Recycling (NCER): NCER is a non-profit organization formed in 2005 that is dedicated to the development and enhancement of a national infrastructure for the recycling of used electronics in the U.S. For more information about the NCER, visit their website at www.electronicsrecycling.org.

About E-Scrap News: Resource Recycling Inc. is a publishing company based out of Portland, Oregon, and has been at the forefront of recycling news for nearly three decades. In addition to the company's flagship magazine, *Resource Recycling*, the firm also publishes *E-Scrap News* and *Plastics Recycling Update*, and hosts annual companion conferences and trade shows for each. For more about the company, visit www.resource-recycling.com.