

## **Fermi National Accelerator Laboratory -- *E-Waste Management and Recycling at Fermilab***

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**Award Category:** Recycling

**Nominee:** Team Nomination: Property Management Group, Fermilab

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### **Nomination Abstract:**

The challenge to effectively manage unneeded electronic equipment has become more daunting in recent years as the quantity of this material has rapidly increased and the realization that conventional disposal creates future environmental liabilities. To address these issues Fermilab has developed a management strategy that minimizes the environmental impact by reusing and recycling the maximum amount of electronics generated from two DOE facilities.

### **Nomination Description:**

Fermilab's high energy physics research mission requires the extensive use of advanced computer technology and a vast array of electronic equipment. Remaining at the forefront of physics research creates a high turnover of electronic equipment and the corresponding need to dispose of these assets in an environmentally sound manner. Fermilab has embraced the responsible management of excess electronics with a comprehensive strategy designed to maximize the recovery of materials and minimize the impact to the environment. In 2005 approximately 200,000 pounds of electronic waste was recycled or reclaimed.

Fermilab's approach to managing unneeded electronics hinges on several key elements. These include lab-wide material disposal policies and guidance, employee training and awareness, property and asset management, and a waste surveillance program. Fermilab has established recycling and waste policies that promote the recovery of un-needed electronics. All employees are given general EMS awareness training that encourages environmentally responsible management of laboratory assets. Employees have also been made aware of how to manage electronics that are excess to their needs by

publishing internal news articles that focus on e-cycling and laboratory asset reuse and by giving specific training to waste management personnel.

Throughout the laboratory, electronic equipment that is no longer needed is transferred to our Property Management Group. Property Management is responsible for ensuring that excess and discarded electronics are managed effectively and responsibly. This group is tasked with determining whether an electronic item can potentially be reused or should be recycled. Items that can be reused are made available internally or are made available externally through outlets such as GSAXess.gov, eBay and Bid4Assets. Approximately 15% of Fermilab's personal computers are reused internally each year.

As a monitoring check to ensure that electronic equipment is not being disposed of improperly, Fermilab has a long-established waste dumpster surveillance program. The program focuses on ensuring that no unauthorized waste is disposed into onsite dumpsters. Included in the program is monitoring for any electronic equipment that contains printed circuit boards. Electronic equipment that is discovered in a dumpster is promptly removed and transferred to Property Management for potential recycling.

Any electronics that are not reused are sent to one of two vendors. In 2005 approximately 160,000 pounds of electronics was recycled by a demanufacturing vendor and 45,000 pounds went to a reclamation company. At a local facility, Intercon Solutions demanufactures for complete recycling electronic equipment down to component parts and raw materials. Fermilab sent 100,000 pounds of monitors and 59,000 pounds of various electronics for demanufacturing. Another 45,000 pounds of electronic equipment was selected to go to a local small business reclamation company where equipment is salvaged for parts reconditioning.

To maximize the efficiency of our e-cycling efforts, Fermilab has partnered with a nearby DOE sister facility Argonne National Laboratory, approximately 20 miles away. The partnership consists of using Fermilab's extensive storage capabilities and integrated property management infrastructure to manage both facilities' excess electronics. Argonne's previous program was expensive to operate due to limited storage capabilities. By partnering with Argonne, both facilities enjoy greater economies of scale due to reduced shipping costs and greater dollar returns on recovered materials from the vendor. Moving materials from Argonne to Fermilab was piggybacked onto a routine mail run already established between the facilities thereby minimizing transportation needs. Approximately 50% of the material that is sent to Intercon for demanufacturing comes from Argonne.

By effectively managing electronics, the Fermilab/Argonne partnership benefited by avoiding the cost of recycling electronics typically not profitable to a vendor. It would have cost approximately \$25,000 to dispose of the 100,000 pounds of monitors generated. The dollar return generated from other equipment covered this expense and some of the management costs to create a near cost neutral program.