

Xerox Corporation

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Asset Recycle Management Xerox Corporation

PROJECT DESCRIPTION

Asset management is the process of managing products and inventory to minimize their environmental impacts at all stages of the product life cycle, particularly end-of-life. It entails reusing an asset either by remanufacturing to its original state, converting to a different state, or dismantling to retrieve the original components. Implemented in 1991, Asset Recycle Management (ARM) is the critical corporate-wide program at Xerox that manages the ever-increasing range of products returned to the company for reprocessing. Xerox has created a recycling and remanufacturing infrastructure that extends product life, meets the same high-quality standards as new-build products, and will help Xerox meet its goal of providing “waste-free” products.

The goal of the Asset Recycle Management program is to achieve zero percent material disposition to landfill by designing waste-free products with minimal impact on the environment. To achieve this goal the following strategies have been implemented:

- Asset management has become a new product design criterion to ensure recycling and remanufacture are included at the first stage of product development. Design-for-environment (DFE), a management tool focused on resource conservation and pollution prevention at the beginning of product concepts, has resulted in initiatives that include:
 - Limiting production materials to recyclable and recycled thermoplastics and metals;
 - Embossing plastic parts with recycling symbols;
 - Marking engineering drawings with remanufacturing codes to expedite processing; and
 - Adopting snap-together designs to facilitate assembly and disassembly processes.
- Key asset management procedures have been incorporated into the company’s current product delivery process (PDP). Xerox has adopted a “focus-factory” concept that integrates new-build and remanufacturing lines to facilitate consistent use of existing manufacturing tools, processes, and product quality controls. The percentage of remanufactured machines has more than doubled in the last five years.
- Cartridge recycling processes have been created whereby customers return spent copy and print cartridges and, most recently, toner containers. The worldwide cartridge return rate for 1995 was approximately 60%, preventing 1100 tons of materials for going to landfill.

The Recycling Process

Field returns that meet equipment remanufacture criteria follow well-established disassembly and reassembly processes. Data recording and damage checks are followed by the removal of external covers, subassemblies, and parts. These pieces are sorted according to their remanufacture codes, cleaned, and repaired to new part standards. Repaired parts and subassemblies are then returned to manufacturing for reassembly in second generation equipment. Parts' assemblies that fall out of the above operation are scrapped to recover the metal and plastic content. Customer-initiated toner and print cartridge returns go through similar processes. Figure 1 illustrates.

Xerox Recycling Processes

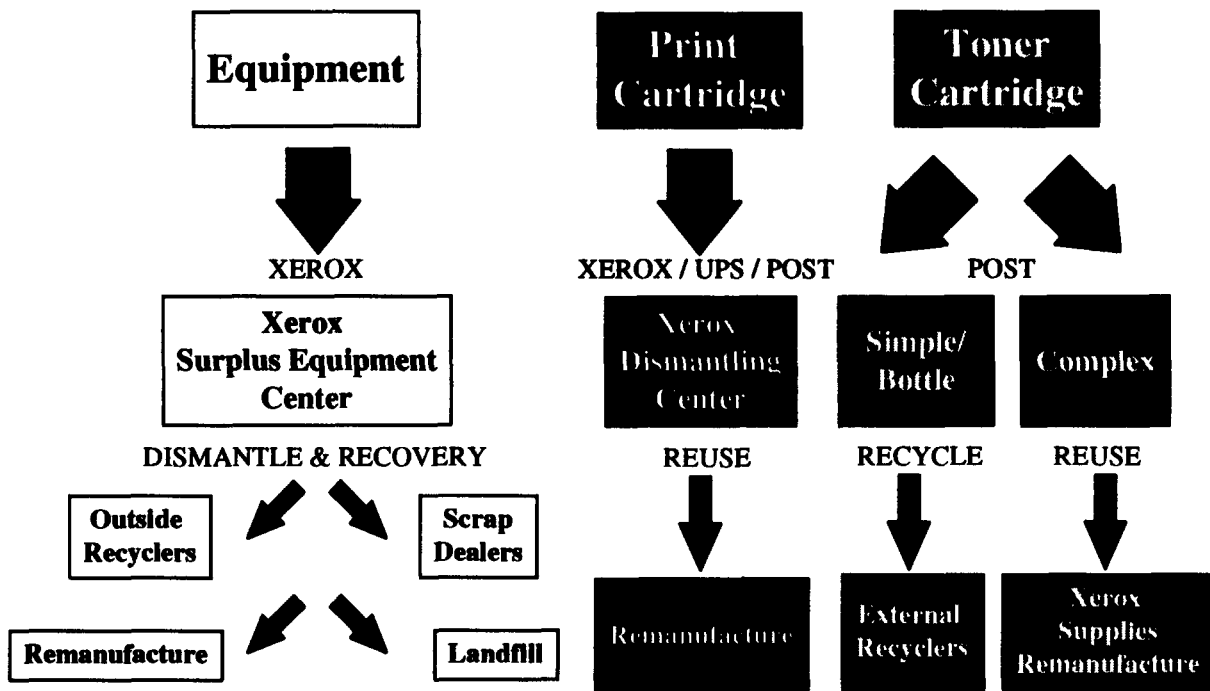


FIGURE 1

By incorporating environmental and remanufacturing considerations into its product delivery process, Xerox not only assumes extended responsibility for its products, but realizes higher financial returns as well. The success of ARM is largely due to positive monetary returns for both Xerox and its customers. With estimated savings exceeding several hundred million dollars in 1995, ARM has the potential to save even more in the foreseeable future.

PROJECT PARTICIPANTS

Product Manufacture

- Xerox Corporation

Product Return

- Canada Poste
- United Parcel Service
- U.S. Post Office

Dismantling, Recovery, Reuse

- Bayer Corporation
- Copco Recycling
- Lucent Technologies
- Seneca Iron & Metal

PROJECT GOALS

- Achieve zero percent material disposition to landfill to minimize the impact on the environment; maximize resource reuse; lower production costs; and improve return on assets.
- Attain “waste-free” factories by 1998 by achieving a 90% decrease in municipal, hazardous, and chemical waste; a 90% decrease in air emissions; a 50% decrease in water discharges; a 25% increase in purchases of post-consumer materials; and a 10% increase in energy efficiency when compared to each facility’s baselines.

PROJECT DRIVERS

- European product take-back proposals (Germany, Netherlands, Sweden, etc.).
- Cost savings potential from remanufacturing & ARM.
- Customer satisfaction and loyalty, as determined from market research.

PROJECT BENEFITS

- ***Solid waste reductions*** -- A 45% reduction between 1991 and 1995 for 17 largest sites.
- ***Enhanced utilization of natural resources*** -- Recycled content in products more than doubled in five years.
- ***Competitive advantage*** -- Created through remanufactured product line in Rank Xerox.
- ***Cost savings*** -- Over \$200 million in annual savings.
- ***Quality*** -- Improved product reliability for remanufactured products.

OVERCOMING PROJECT OBSTACLES/BARRIERS

Internal to Xerox

- Modification of product delivery process to incorporate asset management was achieved by gaining senior level commitment of resources.
- Requiring design teams to consider end-of-life management in product design is being facilitated through a remanufacturing design training program and by standardizing remanufacture and environmental coding processes for all machine parts.

External to Xerox

- Unacceptability of remanufactured products due to “used equipment” misconception is being overcome through sales force education and customer communication.
- Ill-defined/outdated procurement standards and purchasing guidelines in the marketplace are being addressed through cooperative efforts with government procurement and government environmental organizations.

PROJECT PREVIEWS

- **Harvard Business School** -- 1994 case study documents ARM and DFE at Xerox. The case study is used in an academic setting to discuss the viability of Xerox' waste-free objectives and strategies.
- **Massachusetts Institute of Technology** -- Currently reviewing the progress of the waste-free initiatives at Xerox.

PROJECT PRESENTERS

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