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WasteWise Update

EXTENDED PRODUCT RESPONSIBILITY

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EPA WASTE WISE

Preserving Resources, Preventing Waste

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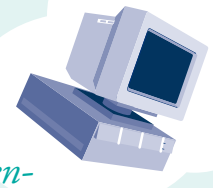
Extended Product Responsi



Product stewardship. Lifecycle management. Design for the environment. Take back. These are but a few of the strategies that fall under the broad umbrella of extended product responsibility (EPR)—a new approach to pollution prevention embraced by WasteWise partners in the 1990s. EPR is a product systems approach to resource conservation and waste reduction. No longer is the focus on what an individual manufacturer can do to reduce waste produced at its facilities. EPR expands the frame to encompass entire product systems and asks how all the players in the product chain—from those who extract and process raw materials; through the product designers, manufacturers, distributors, and retailers; to the consumers, users, recyclers, and disposers of products—can collaborate to reduce environmental impacts and resource use associated with the product throughout its life cycle.

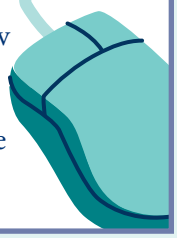
In Europe and parts of Asia, governments are giving product producers and importers primary responsibility for taking back or paying for management of some products at end-of-life (called "producer responsibility"). The focus in these countries is on shifting some or all of the cost of waste management from taxpayers to producers and creating a financial incentive for producers to design their products to make less waste.

EPR takes a broader view, recognizing that all actors in the product chain must work together to ensure more efficient use of resources and less waste. This means, for example, that consumers have a role to play in choosing to buy less wasteful products, repairing and reusing products that still have "life," and recycling products at the end of their useful life. Moreover, EPR recognizes that product manufacturers are often in a unique position—through their capability to affect product design, material choices, manufacturing processes, and product delivery—to reduce the lifecycle environmental impacts of their products. In many cases, this means manufacturers can design products to use less material, more recyclable material, fewer toxic constituents, or greater recycled content. They also can design products to be more durable, energy efficient, readily repairable, upgradeable, or reusable. In addition, they can take back products for repair, reuse, or recycling. There are many different ways to extend product responsibility.

Consistent with this outlook, many WasteWise partners are embracing EPR in a variety of ways as a means to save money, drive product innovation, better serve customers, and enhance competitiveness. Not all of the examples below address all phases of the product life cycle. Indeed, incorporating all elements of EPR might not be feasible for all product systems at this time, but applying as many as possible will move partners closer to realizing the complete vision of EPR.

Coming Soon—Cyber EPR

Watch out for announcements of EPA's new Web site on EPR. This site, linked to the WasteWise home page, will describe EPR and its history, review EPR developments around the world, provide more examples of EPR in action in the United States, and include resources for more information.



bility

This issue of the *WasteWise Update* highlights strategies in use by our partners that address the following:

- **Design for the environment.** Assessing environmental impacts over the product life cycle and designing products to use resources efficiently are two approaches used by WasteWise partners to lessen the environmental impact of their products. **Allergan**, for example, reduced more than 800,000 pounds of packaging by redesigning the manufacturing process to reduce rejects. **Dan River, Inc.** researched new technologies to improve its manufacturing process and save an estimated 375,000 pounds of waste per year.
- **Supply chain and industry partnerships.** Partnerships, whether they are between suppliers and customers or between competitors can result in significant savings. **Public Service Electric and Gas Company**, for example, established a partnership with its suppliers to minimize overstock of supplies. Partnerships, even with competitors, are another way WasteWise partners can come together to reduce waste. This *Update* looks at the example of the Vehicle Recycling Partnership in the auto industry.
- **Leasing.** Leasing arrangements between suppliers and customers are an important means of reducing waste. Leases relieve customers of waste management responsibility at a product's end-of-life and create an incentive for the supplier to design the product for easy reuse, upgradeability, and recycling. Both **Monsanto** and the city of **San Diego** eliminated the outright purchase—and disposal—of products through leasing.
- **Take back.** By establishing take-back programs with customers or vendors, partners have reaped impressive savings. The **Xerox Corp.**, for example, saved millions of dollars with its product take-back program and helped reduce disposal burdens for its customers. In this *Update* we also look at the example of the **Rechargeable Battery Recycling Corporation,** which organized take back for an entire product sector.

Extended Product Responsibility and Climate Change

In addition to increasing competitiveness for our partners, the product innovations and resource conservation benefits associated with product responsibility can frequently lead to reductions in greenhouse gas emissions by:

- **Reducing emissions from energy consumption.** Products reconfigured or redesigned to reduce materials require less energy to produce. Similarly, products made from recycled materials, and more durable products, are also more energy efficient. When less energy is used, fewer fossil fuels are burned and less carbon dioxide enters the atmosphere.
- **Reducing emissions from incinerators.** Diverting certain materials from incinerators through waste prevention or recycling reduces greenhouse gas emissions.
- **Reducing methane emissions from landfills.** Waste prevention and recycling divert wastes from landfills, reducing methane emissions that contribute to global warming.
- **Increasing absorption of carbon dioxide by trees.** More efficient use of paper and wood resources, through source reduction and recycling, leaves more trees standing in the forest, to absorb carbon dioxide from the atmosphere.

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DESIGN FOR THE ENVIRONMENT

Design for the environment (DfE) programs incorporate environmental considerations into the design of manufacturing processes and finished products. WasteWise partners prevent millions of pounds of waste each year by redesigning manufacturing processes and products to be more energy and material efficient. Lifecycle analysis is one tool partners use to assess the environmental impact of their products, from choice of materials through manufacturing, distribution, use, and final disposal.

Allergan's Strategy for Success

Seven years ago, pharmaceutical manufacturer **Allergan** realized that its production processes were creating a lot of waste and were environmentally and economically unsound. Allergan developed a three-part waste reduction strategy to combat this issue.

First, Allergan looked for ways to reduce or eliminate the amount of materials flowing out of the manufacturing facilities as waste instead of product. Allergan identified wastes generated at each facility and then identified options for either reducing, eliminating, or reusing them. In some cases, Allergan found a way to reuse materials in the production process, for instance, regrinding plastic resins for reuse in the manufacture of new bottles. The company located markets for other materials, either for sale as commodities or for offsite recycling.

Next, Allergan looked at production processes to determine what caused process rejects. Previously, Allergan assumed rejects were inherent in the process and, therefore, could not be eliminated. According to Michael Whaley, director of environmental health, "Our understanding of the cause of rejects was based on anecdotal information rather than actual measurements." The company, for example, thought the cause for line rejects at one facility was labeling. After close examination of the process, however, Allergan found line rejects were primarily caused by filling level defects and cap defects in addition to labeling. Facility personnel used this information to eliminate these production problems, thus reducing waste generation.

Through its manufacturing process changes, Allergan significantly reduced product rejects during the packaging portion of the process. In 1997, the company eliminated 805,000 pounds of primary and secondary packaging, a 12 percent increase over 1996 reductions!

The third step in Allergan's strategy was to incorporate waste prevention into the design phase of products. The Allergan Environmental Product Design Criteria, created by an interdisciplinary team, help prevent the creation of waste and lessen Allergan product impacts on the environment. The criteria include methods for environmentally evaluating product materials, such as using nonhazardous materials instead of hazardous ones, and improving packaging attributes such as ensuring materials are recyclable and using recycled materials in packaging.

Allergan solidified the benefits of the Design Criteria by developing a quantitative scoring system to measure results. Comparisons of three newly designed products with products designed prior to the establishment of the criteria revealed a marked decrease in the newer products' environmental impact. While the existing product scores ranged from 20 to 60 out of a possible 100, all of the newly designed products rated between 67 and 70 out of 100! In addition, all three of the new products evaluated scored 10 out of a possible 10 for packaging material recyclability. Results like these demonstrate that Allergan product designers have become increasingly aware of the benefit of taking 'extended responsibility' for their products.

The key to Allergan's success? Whaley emphasizes, "The company was successful in its endeavors due to the integrated approach and the support from the manufacturing, marketing, R&D, and regulatory affairs employees. Both elements were absolutely essential." Contact Michael Whaley at 714 246-5942 for more information.

Dan River Weaves Improvement Into Manufacturing Process

WasteWise partner **Dan River, Inc.,** a leading textile manufacturer, went 'the whole 9 yards' while researching innovative process improvement opportunities. In 1997, Dan River conducted an extensive trial study of byproducts generated by cotton and polyester fiber production. Dan River, in conjunction with the Institute of Textile Technology (ITT), located in Charlottesville, Virginia, studied the feasibility of reusing portions of yarn production byproducts.

During a 2-week period, Dan River extracted the waste fiber byproduct that would normally be disposed and sent it to a yarn production facility for blending with its regular fiber. ITT tested samples of the blended product against control samples of virgin yarn and discovered no significant difference in quality or efficiency. The trial study diverted 15,000 pounds of byproduct waste and saved $7,000. Dan River projects the process will prevent 375,000 pounds of byproduct waste and save $175,000 each year!

The driving force behind the study, Greg Boozer, vice president of Manufacturing Services at Dan River, initiated meetings with plant supervisors and managers and solicited help from ITT. Initially, some employees expressed concern about the possible impact on yarn quality and weaving efficiency. The addition of ITT's expertise and lab facilities proved to be the critical element to increasing the study's credibility and validity and in winning over skeptics.

New yarn manufacturing machinery, purchased in 1994, enabled Dan River to explore these fiber waste reclamation opportunities. These new machines also opened doors to new waste reduction and cost cutting methods through more efficient use of virgin material. With the success of the trial study, Dan River now can install additional equipment to extract the good fiber from the waste byproduct.

Dan River documented and publicized the trial study's measurements, analysis, and results in informal internal reports, newsletters, and memos. John Thompson, the liaison between Dan River and ITT, asserts "the combined effort of Dan River and ITT was key to the success of this project" and that "partnering with a scientific research organization ensured a completely unbiased approach with thorough, accurate testing of product quality and efficiency." Thompson encourages other textile manufacturers to investigate opportunities for reusing their fiber waste byproduct and recommends a scientific approach for trial studies. For additional information on Dan River's study, please contact John Thompson, Senior Industrial Engineer at 804 799-8898.

Product Stewardship at Hewlett-Packard

Hewlett-Packard (HP) initiated a product stewardship program in 1992 that strives to prevent or minimize negative environmental impacts that might occur at any point in the life of an HP product—from design and manufacture to end-of-life. HP's design for the environment guidelines created under this program seek to achieve the following:

- Design products and packaging to minimize energy consumption, use fewer raw materials, and increase use of recycled and recyclable materials.
- Develop products that are easier to disassemble for reuse or recycling.
- Reduce waste and emissions from manufacturing processes.

HP facilities are taking advantage of design improvements that facilitate disassembly. The Product Recycling Solutions (PRS) Group disassembles and refurbishes HP and non-HP equipment and parts for HP's repair service organization. PRS processes 12,000 tons of equipment annually, less than 1 percent of which enters the waste stream. HP's own divisions contribute 60 percent of this equipment, while customer deinstallation and HP's service organization contribute 25 and 15 percent respectively. Contact Paul Quickert at 650 857-7939 for more information.

PARTNERSHIPS

Pooling resources and creating partnerships to explore new approaches is another EPR strategy WasteWise partners are using to reduce waste. Partnerships between competitors and between suppliers and customers often result in a win-win situation for both the participants and the environment.

PSE&G Takes Products Back to Their Source

Is old inventory taking up space and gathering dust in your warehouse? By overpurchasing products, you might actually be 'buying' waste that eventually needs to be discarded. WasteWise partner **Public Service Electric and Gas Company** (PSE&G) battled this issue when it discovered several of its facilities were overpurchasing numerous products from as many as 270 suppliers. PSE&G solved the problem by designing a streamlined purchasing process that prevents inventory waste. By cutting down its contracts to only nine suppliers and implementing a product take-back policy in 1997, the company saved more than $2 million!

> **" Your company, no matter how big or small, can negotiate to pay only for products that it will use."**
>
> —Christy Barone, hazardous materials analyst, PSE&G

Christy Barone, a hazardous materials analyst on PSE&G's Materials Management Team, explained how the company analyzed its inventory's "life cycle," particularly that of chemical commodities and paints. The life cycle inventory analysis revealed each facility purchased supplies separately. Since most suppliers encouraged purchasing in bulk, many facilities ended up with excess product. Leftover inventory was sent to PSE&G's central resource recovery facility, where materials were sorted, sent to disposal facilities, or if possible, sold. PSE&G decided it could avoid having to find markets or disposal capacity for the extra inventory by simply improving its purchasing practices.

The Materials Management Team narrowed PSE&G's list of suppliers by maintaining only a few long-term contracts. The selected suppliers agreed to keep track of the inventory each PSE&G facility purchased. Now, when PSE&G facilities call to order products, the vendor checks to see if other PSE&G facilities already have the product in stock. If additional supplies are available at other PSE&G facilities, the vendor informs the facility it can acquire them without purchase. The suppliers also take back any extra or discontinued products and sell them to other customers. By placing responsibility on its suppliers, PSE&G no longer disposes of its unused, excess products.

For those organizations interested in partnering with their suppliers to ensure better purchasing management, Barone suggests setting up a consignment policy. "Ask your suppliers to be responsible for products they sell to you and have them help you maintain your inventory. Your company, no matter how big or small, can negotiate to pay only for products that it will use." For more information on PSE&G's program, contact Christy Barone at 973 430-3670.

Vehicle Manufacturers Disassemble Cars to Keep the Environment Together

Of all vehicles removed from service today, 95 percent are processed for recycling and, on average, 75 percent (by weight) of an end-of-life vehicle is reused or recycled. How is the automobile industry striving to increase this recycling rate? One way is through the Vehicle Recycling Partnership (VRP) established in 1991 by WasteWise partners **Ford Motor Company** (Ford), **General Motors** (GM), and **Chrysler**. The VRP promotes the development of economical recycling technologies to increase the reusability and recyclability of vehicle parts and materials. The aim is to promote a sustainable, market-driven vehicle-recycling infrastructure, while reducing the environmental impact of end-of-life vehicles.

The partnership enables each of the companies to achieve more through cooperative research in the precompetitive stage than they might individually. While each of the member companies set its own guidelines and strategies, their ultimate goal is the same—to conserve resources, increase recycled content materials included in the production of the vehicle, and increase recyclability of the vehicle at the end of its life cycle.

One of the key components of the partnership is the Vehicle Recycling Development Center. Through this center, engineers from Chrysler, Ford, and GM demolish old and new cars to learn how to improve car design for easier dismantling and better access to key parts for future removal. Auto makers are investigating the following options to improve recyclability:

- Selecting materials for which proven recycling technologies exist.
- Reducing the number of materials and parts used in assembly.
- Facilitating disassembly by selecting fastener systems that ease disassembly after the vehicle reaches the end of its useful life.
- Reducing the number and types of fasteners used.
- Marking plastic parts to facilitate recycling and repair.[1]

The result? Auto manufacturers hope to increase the recyclability of new vehicles from 75 to 85 percent by 2000. For more information see <www.aama.com/environment/comaware.html>.

[1]American Automobile Manufacturers Association, *What Manufacturers Are Doing to Improve Recycling*, 1996.

Recycled Materials Bump Virgin Plastic at Ford

Ford Motor Company began its bumper take-back and recycling program in 1993, as a pilot program to recycle plastic bumper material into tail light housings. Today, the program is annually recycling 1.5 million pounds of post-consumer bumper plastic back into new bumpers.

Since 1986, Ford had made most of its bumpers with Xenoy resin, a blend of polyester and polycarbonate resins, which is well suited for use in bumpers because of its strength and flexibility throughout the range of conditions faced by automobiles.

The bumper take-back and recycling program began with an arrangement between GE Plastics and Ford to test bumper recycling. The company found the tail light housings made from recycled bumper material met stringent quality and safety standards and cost less to produce.

In order to collect bumpers for recycling, Ford partnered with American Commodities, a plastics recycler. American Commodities developed a network of 400 dismantlers across the country for the take-back program and provided them with a written specification on methodologies for dismantling and product identification.

Ford found greater cost savings in recycling bumper material back into bumpers rather than into tail light housings because the virgin Xenoy material for bumpers is more expensive than the virgin ABS material Ford traditionally uses for tail light housings. Ford plans to use recycled Xenoy at a rate of approximately 0.5 million pounds per year in service parts for bumpers on all Ford models.

American Commodities recycles between 6 and 8 million pounds of Ford bumper material per year, and sells the used recycled material to other manufacturers. The material is sold at a 25 to 30 percent cost savings as compared to virgin Xenoy. According to Tony Brooks, "American commodities has done an excellent job updating its processes to keep up with the latest technology used at Ford." For more information, contact Tony Brooks at 313 390-4798.

LEASING

Leasing arrangements between customers and suppliers are another way our partners are keeping waste out of their dumpsters and getting more value at the same time. WasteWise partners are investigating leasing options for everything from computers to manufacturing equipment to carpeting.

Monsanto and Dell Save Megabytes of Waste

Escaping the trap of computer obsolescence preoccupies many Information and Technology (IT) professionals. Together, WasteWise partners **Monsanto** and **Dell Computer Corporation** found a way to do just that. Since March 1997, Monsanto's production facility in Luling, Louisiana, has been leasing computer equipment from Dell in an arrangement that not only reduces waste for Monsanto but also consistently provides them with high-quality computer workstations.

According to Monsanto IT team leader, Scott Conlin, "An examination of Monsanto's total cost of personal computer (PC) ownership showed that there were some compelling business reasons to move to computer leasing." When asked about some of the practical benefits of a leasing program, Conlin noted it "eliminated a number of ongoing problems including PC disposal, routine PC upgrades, and IT resource demands."

Identifying the Waste Problem

Problems began to mount as Monsanto's PC network grew older and seemingly slower in a world where microprocessor speeds continually increase. Monsanto's PC network was becoming obsolete far ahead of the depreciation schedule. Additionally, the age-old practice of PC hand-me-downs was causing a torrent of IT service demands. As Monsanto purchased new systems and handed down old machines, IT team members continually scurried to update and reconfigure systems for their new owners. "With more than 600 PCs at Luling alone, we had a major problem on our hands," Conlin admitted.

That's when Monsanto got creative and worked out the finances for a leasing program. In late 1994 and early 1995, Monsanto identified leasing as a cost-effective solution to its growing problem. By 1997, the Luling facility became a leasing test site. Currently, the company is approximately 80 percent committed to leasing—with a system that could have as many as 15,000 PCs in service at one time.

The Dell Option

Conlin explains "it is a great partnership for Monsanto as well as Dell." Monsanto leases high-end computer workstations for plant employees on a 24- or 36-month program that ultimately returns the used systems to Dell. John McDonald of Dell Financial Services (DFS), the company's leasing program, says returned PCs often continue to have valuable life after the lease ends. Dell's leased systems provide the company with a number of remarketing avenues including spare parts reclamation, sales to secondary markets, and re-leasing to organizations who don't need the latest technology.

Does Dell build leased systems differently than other units? "No," replies McDonald. "All Dell systems are built for serviceability, disassembly, and reuse. Component consistency and a modular chassis are features of Dell leased systems that make refurbishing and reclaiming parts easy."

Disposal Issues

In addition to reducing disposal due to PC obsolescence, Conlin noted an additional benefit of leasing that helps reduce electronics waste for Monsanto. The leased PCs are covered by a 3-year warranty, freeing Monsanto from having to purchase replacement electronics and finding disposal solutions for the bad parts. WasteWise estimates the waste prevented with this program could be more than 210,000 pounds annually, with PCs averaging 56 pounds of materials per unit.

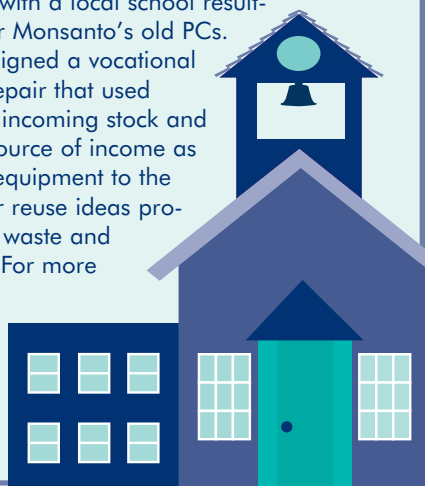
Lessons Learned

Monsanto learned some valuable lessons in the switch to leasing. Conlin emphasizes what organizations should consider before making a decision to lease. "First, fully understand the financial implications of the decision." Conlin knows it might not always seem financially preferable at first look, "but considering the PC life cycle, your company is always going to be on the top of the technical curve." Secondly, PCs should be considered a tool for office use that must be replaced periodically; in Monsanto's case, every 3 years. Monsanto believes its leasing program is working and is phasing it into the rest of its U.S. facilities.

For more information on Monsanto's experiences, contact Scott Conlin at 504 785-3409. Additional information on the Dell leasing program can be obtained from its Web site at <www.dell.com/dfs/index.htm>.

No Lease? Choose REUSE!

Before working with Dell on a lease, Monsanto needed new homes for existing PCs at the end of their useful lives. The company had such a high volume of materials needing special disposal that Monsanto resorted to stockpiling for a time, wasting storage space and personnel time. Ultimately, partnership with a local school resulted in a reuse option for Monsanto's old PCs. A local high school designed a vocational training course in PC repair that used Monsanto's systems as incoming stock and ultimately provided a source of income as they sold the repaired equipment to the public. These and other reuse ideas provide quality options for waste and benefit the community. For more ideas see the *WasteWise Update Donation Programs: Turning Trash into Treasure.*



Waste Prevention Is Under Foot in San Diego

They're standing on their waste-prevention principles in the **City of San Diego's Environmental Services Department**. The carpeting that fills this WasteWise partner's halls and offices is designed to provide years of long life and to reduce waste.

In 1996, San Diego entered a carpeting lease agreement with Interface, an Atlanta-based carpet manufacturer. In this unique arrangement, San Diego never actually purchases the carpet from Interface, so it will never have to dispose of massive amounts of worn or damaged carpet. At 10 pounds per yard, San Diego will avoid disposing of 250,000 pounds of carpet waste over the life of this arrangement.

And the quality? According to San Diego's Sustainable Building Coordinator, Adam Saling, "The quality and durability, as well as the 12 percent recycled content, of the carpet were the main reasons for going with Interface." Interface uses post-industrial carpet waste in the production of the carpet squares. Durability is enhanced by using 18-inch carpet squares that can be rotated from high-to low-traffic areas.

But why the lease? Saling noted two reasons any business can understand. "We had a limited amount of capital outlay for the materials, and at the end of the carpet life, the manufacturer will remove the carpet and recycle the fibers and backing into new product." This waste reduction opportunity is enhanced by the ability to selectively replace damaged or over-worn squares.

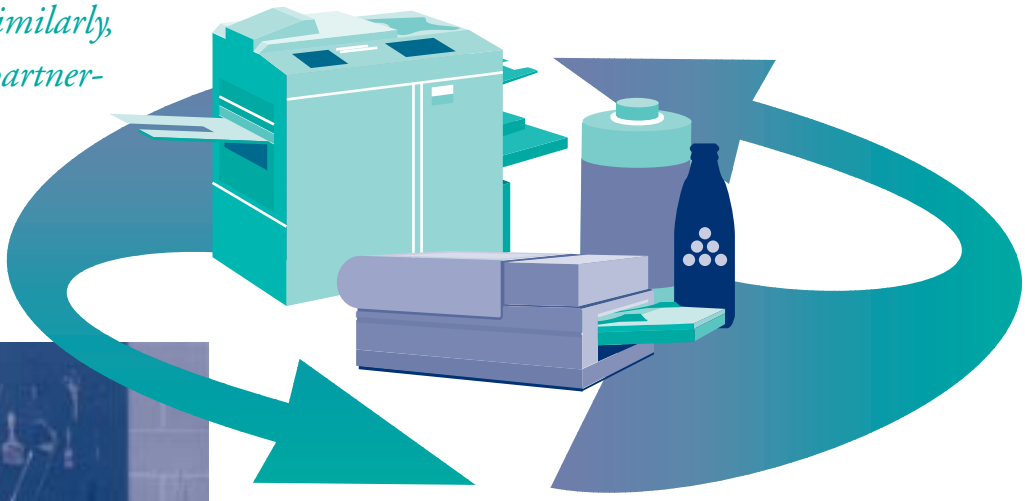
When asked about the system performance 2 years after installation, Saling noted it is holding up well. The system is under a 5-year lease contract, but is backed by a 15-year warranty.

Saling noted several lessons San Diego has learned from the leasing approach. First, he encourages anyone interested in a lease to analyze costs of leasing versus purchasing. Comparative cost analysis of carpet squares and typical area carpeting indicates squares cost about 30 percent more. The longer life and lower replacement and maintenance costs, however, provide an economic advantage over the system life. Second, negotiate the best possible lease terms, such as high-quantity discounts and government rates. Finally, Saling notes that upon installation of the system your organization must commit to regular maintenance through rotation in high traffic areas and to diligently follow Interface's cleaning regimen.

For more information on San Diego's carpet square leasing experience, contact Adam Saling at 619 492-5018.

TAKE-BACK PROGRAMS

Most manufacturers work hard to convince customers to buy their products. But how many manufacturers worry about what happens to those products after their customers use them? Too often, products end up in landfills or incinerators, squandering a potentially reusable resource and adding to the environmental threats posed by disposal. Some companies are working to keep their products out of the waste stream by taking back products from customers for reuse or recycling. Similarly, some companies are establishing partnerships with vendors to facilitate recovery and reuse of what would otherwise be waste.



Charge Up to Recycle! Ni-Cd Batteries: Panasonic and RBRC

If watching Al on television's *Home Improvement* has you charged up about your power tools, imagine how he could energize your thinking about power sources...rechargeable Nickel-Cadmium (Ni-Cd) batteries, perhaps? Imagine no more. Richard Karn, a.k.a., Al, is the national spokesperson for the Rechargeable Battery Recycling Corporation (RBRC), a nonprofit public service organization created by the industry in 1994, which collects and recycles used household and commercial Ni-Cd batteries from retailers, communities, businesses, and public agencies.

Founding RBRC

Best known by its Panasonic brand, WasteWise partner **Matsushita Electric Corporation of America (MECA)** is one of five founding companies behind RBRC and its Charge Up to Recycle! program. David Thompson, director of MECA's Corporate Environmental Department, and the first president of RBRC, commented on MECA's support of the program: "Panasonic (MECA) is pleased to have played a leadership role in promoting and achieving sustainable development in the battery industry. Today, our involvement remains strong. In fact, RBRC's current board chair, Charlie Monahan, is a colleague here at Panasonic." Other founding companies include Sanyo Energy (U.S.A.) Corporation; Eveready; SAFT America, Inc.; and Varta Batteries, Inc.

Why Ni-Cds?

Of the more than 2.5 billion small sealed consumer batteries sold in the United States each year, 350 million are

rechargeable Ni-Cd batteries. Used to power a wide range of consumer goods, Ni-Cd batteries are found in items such as power tools, laptop computers, cellular phones, two-way radios, and video cameras, as well as toys and toothbrushes. Ni-Cd batteries, by design, illustrate the concept of reuse. These batteries can be recharged up to 1,000 times.

When spent (i.e., used), consumer (or dry-cell) batteries form a small but potent part of the municipal solid waste (MSW) stream. While intact batteries are harmless, Ni-Cds test hazardous under an EPA procedure that shreds the battery. Cadmium is associated with health risks including lung and kidney damage. The heavy metal also is toxic to fish and wildlife.

Recycle Nickel-Cadmium (Ni-Cd) Rechargeable Batteries

RBRC RBRC Ni-Cd

Look for the Seal

For more information, call 1-800-8-BATTERY or visit our website, www.rbrc.com.

A Waste Management Dilemma

By 2000, spent consumer Ni-Cd batteries are expected to contribute 75 percent of the cadmium in MSW. This represents approximately 4.6 million pounds of material available for recycling. Recycling used Ni-Cds appears to be the best environmental management option, once the batteries' reuse potential has been exhausted. But who can make sure this happens?

The Ni-Cd industry debated internally about whether responsibility for recycling Ni-Cds at the end of their useful life should reside with the battery marketer, the buyer (i.e., the consumer), or the producer. In addition, the industry battled over who was the battery producer. While only a few companies actually make battery cells, many buy and assemble the battery packs, ultimately marketing them under their own brand name. It was clear that to ensure spent Ni-Cd batteries were collected and recycled, many players in the product chain would need to join together in partnership. This is an example of where the makers and marketers of a product took it upon themselves to ensure the right thing—in this case recycling—happened.

RBRC's Legislative Link

What today is a cooperative partnership between industry, government, and the consumer has its roots in legislation. RBRC, joined by Portable Rechargeable Battery Association (PRBA)—a nonprofit trade association of the portable power industry—helped champion state-based legislation and regulatory reform that made the brand owner responsible for separating Ni-Cd batteries from the MSW stream for collection and recycling or separate disposal. This early approach, however, proved less than workable, with varying state laws imposing varying battery management standards.

Nonstandardized requirements imposed a huge burden on the battery industry. Customizing collection was not cost effective for an industry sector operating in a global economy. As a result, RBRC and PRBA pushed for national battery management standards. The Mercury-Containing and Rechargeable Battery Management Act of 1996, according to Thompson, helped "...change the face of battery collection from a state-by-state approach to a nationwide [voluntary] collection and recycling effort." The act also established national, uniform labeling requirements for Ni-Cd batteries and helped standardize regulatory requirements nationally for management and labeling of these batteries.

Today, RBRC provides for collection, transportation, storage, and recycling of used Ni-Cd batteries. The program accepts these batteries from retailers, local community recycling coordinators and other consolidation points, businesses, and government agencies. Retailers participating in the program promote the Charge Up to Recycle! Seal and let their customers know they will accept used Ni-Cd batteries. Then retailers send these batteries to RBRC's recycling facility in Pennsylvania in preaddressed, freight-paid collection containers provided by RBRC.

Currently, the Charge Up to Recycle! program operates in the United States and Canada. Thompson is encouraged about the program's growth and positive environmental impact. "I hope other WasteWise partners will avail themselves of this program, recycle their Ni-Cd batteries, and shop for the Seal," says Thompson. For more information about the RBRC, call 352 376-5135 or check out its Web site at <www.rbrc.com>.

About RBRC

RBRC, and its Charge Up to Recycle! program is funded through licensing of its Battery Recycling Seal for use on Ni-Cd batteries. With more than 270 active licensees, the program covers more than 80 percent of the Ni-Cd batteries sold in North America. The program's goal is to collect and recycle 70 percent of the used Ni-Cd batteries disposed of in municipal waste by 2003. RBRC funds the development of Ni-Cd recycling plans for communities, retailers, businesses, and public agencies. A toll-free number 800 8-BATTERY provides consumers information on more than 20,000 battery collection sites across the United States and Canada.

Electronics Take-Back Resources

All participants in a product's life cycle, including consumers, need to assure the most "environmentally friendly" disposal of products at the end of their usable 'lives.' In the case of electronics and computers, consumers too often stockpile or throw away equipment for lack of better alternatives. The resources listed below can help your organization locate outlets that reuse and recycle these items.

- **EPA's *Electronics Reuse and Recycling Directory*.** This directory is available from the RCRA Hotline at 800 424-9346, 703 412-9810 (greater Washington, DC metropolitan area), or 800 553-7672 (TDD for hearing-impaired) or online at <www.epa.gov/epaoswer/non-hw/recycle/reuse/electdir/recycle1.htm>. It lists contact information for original equipment manufacturers that take back electronic products for reuse or recycling; scrap dealers that utilize certain materials or components within these products; businesses that dismantle, repair, or refurbish electronic items; community and charitable organizations that donate used goods to those in need; and materials exchanges that link buyers and sellers of electronic products.
- **The Institute for Local Self-Reliance's *Plug Into Electronics Reuse* Booklet.** This booklet presents information on 22 electronics reuse organizations. The booklet is available by mailing a publications order form available through the Institute for Local Self-Reliance's Web site at <www.ilsr.org/recycling> or by calling 202 232-4108. The cost of the booklet is $15 plus shipping and handling.
- **The National Safety Council's Environmental Health Center.** The center periodically publishes the *EPR2* (Electronic Product Recovery and Recycling) *Update*, free of charge. To receive the update, fax a request to 202 293-0032, Attn: *EPR2 Update* or e-mail Dawn Amore at <amored@nsc.org>. *EPR2 Update* also is available through the center's EPR2 Web site at <www.nsc.org/ehc/epr2.htm>. This Web site includes conference information, related Web links, and ideas on what to do with used computer equipment.
- **The PEP's (Parents, Educators, and Publishers) Used Computer Donations Directory.** This online state, national, and international directory lists agencies that facilitate donations of used computer hardware for schools and community groups. The site is located at <www.microweb.com/pepsite/Recycle/recycle_index.html>.
- **The EPA Region 10 Web Site.** This home page includes a site discussing how to recycle computers and electronic equipment. Although some data is only applicable to Washington State, the site also contains national information. The home page is located at <epainotes1.rtpnc.epa.gov:7777/r10/owcm.nsf/recycle/pcrecycle>.

Xerox' Take-Back Program Promotes "Waste Free Products" Goal

Xerox conserved more than 1.1 million pounds of plastic and 88 million pounds of metal in 1997 by setting up systems to facilitate the reuse and recycling of parts. The programs also have saved Xerox a substantial amount of money. Xerox estimates annual savings in raw material, labor, and disposal, as a result of asset reuse and recycling, exceed $200 million. According to Xerox, "The company's asset recycling and Design for the Environment program merge environmentalism with good business sense."

Xerox initiated its asset recycling program by encouraging customers to return used copiers. Employees log, disassemble, and sort parts from returned copiers that meet internal criteria for remanufacturing. Today, Xerox takes back a range of other products, including printers and toner bottles. Xerox incorporates remanufactured parts into new products. Parts that do not meet remanufacturing criteria and cannot be repaired are often ground, melted, or otherwise converted into basic raw materials. The company integrates remanufacturing into the same assembly lines that produce new products. The aim of the asset recycling program is to prevent Xerox product assembly and disassembly from producing landfill waste.

According to Xerox, "The company's asset recycling and Design for the Environment program merge environmentalism with good business sense."

For more information, contact Patty Calkins, manager, Environmental (Leadership) Marketing, for Xerox at 716 422-9506.

We'd Like to Hear From You!

Questions? Comments?
Contact us at 800 EPA-WISE (372-9473), or by e-mail at <ww@cais.net>. Or visit our Web site at <www.epa.gov/wastewise>.

Resources

PUBLICATIONS

Eco-Efficiency: The Business Link to Sustainable Development.

Authors Livio DeSimone and Frank Popoff, chairmen of 3M and Dow Chemical, respectively, discuss how corporations are "publicly accountable" in this third book from the World Business Council for Sustainable Development (WBCSD). The book includes many examples of how WBCSD members are applying the precepts of ecoefficiency and also how manufacturers are rethinking their businesses to focus on providing services rather than products. For more information, contact The Massachusetts Institute of Technology Press, 5 Cambridge Center, Cambridge, MA 02142-1493.
Phone: 800 356-0343
E-mail: mitpress-orders@mit.edu
Web site: mitpress.mit.edu/book-home.tcl?isbn=0262041626

Environmental Life-Cycle Management: A Guide to Better Business Decisions.

The National Office of Pollution Prevention and the Hazardous Waste Branch of Environment Canada recently published this guidebook for small- and medium-sized businesses. The guidebook helps companies take a lifecycle approach in business decision-making. The guidebook gives an overview of the concept of lifecycle management and offers a framework for applying it to five different job functions. To purchase a copy, contact Environmental Protection Publications.
Phone: 819 953-5750
Fax: 819 953-7253

Environmental Resource Guide. The American Institute of Architects (AIA).

This manual assesses the environmental lifecycle performance of building materials and provides case study profiles. To order, contact John Wiley & Sons at 800 879-4539 or AIA at 800 365-2724.

Extended Product Responsibility: A New Principle for Product-Oriented Pollution Prevention (EPA530-R-97-009).

This report reviews the evolution of extended product responsibility, tracing its origins in Europe to its formulation in the United States by the President's Council on Sustainable Development. The report also presents indepth case studies of U.S. companies in the appliance, automotive, electronic, battery, and cleaning services industries that practice extended product responsibility. These case studies illustrate some of the important business advantages of embracing extended product responsibility. The report can be viewed online at <www.epa.gov/epaoswer/non-hw/reduce/epr>. To obtain a printed copy, call the RCRA Hotline at 800 424-9346, 703 412-9810 (greater Washington, DC metropolitan area), or 800 553-7672 (TDD for hearing-impaired).

Extended Product Responsibility: A Strategic Framework For Sustainable Products (EPA530-K-98-004).

Written for company senior managers, this brochure provides a concise definition of extended product responsibility and describes how implementing it has a positive effect on a company's bottom line. To order a copy, please call the RCRA Hotline at 800 424-9346, 703 412-9810 (greater Washington, DC metropolitan area), or 800 553-7672 (TDD for hearing-impaired).

Managing Eco Design: A Training Solution.

The U.K.-based Centre for Sustainable Design published this training manual for environmental product design that offers practical examples from a variety of business sectors. The six-module course covers how to manage the ecodesign process and the key issues involved in developing an ecodesign program. The manual is accompanied by a CD-ROM (in two versions, for Windows- and Macintosh-based computers) containing additional resources. The manual also

describes tools available to implement ecodesign, including lifecycle analysis checklists, and ideas for developing an internal training and communications program. One module contains 11 case histories of such companies as The Body Shop, Electrolux, Hewlett-Packard, IBM, Kodak, and other North American and European companies. This publication is available for £250 (about $409) from the Centre for Sustainable Design, Faculty of Design, Falkner Road, Farnham, Surrey GU9 7DS, U.K.

Phone: +44-1-252-73-2229
Fax: +44-1-252-73-2274
Web site: www.cfsd.uk/med-training.htm
E-mail: cfsd@surrart.ac.uk.

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Pathway to Product Stewardship: Life-Cycle Design as a Business Decision-Support Tool.

This report explores the notion that, in order to be competitive, companies must consider the impacts of product design beyond just production stages. Product design needs to encompass environmental impacts as well, giving more responsibility and accountability to companies in the use, post-use, and disposal stages of their products. The report provides three case studies that illustrate the specific methodologies, strengths, and accomplishments of life-cycle design (LCD) programs started at IBM, Bristol-Myers Squibb, and Armstrong World Industries. A copy can be ordered through EPA's Pollution Prevention Information Clearinghouse's Web site at <www.epa.gov/opptintr/library/ppicdist.htm#EPP> or by phone 202-260-1023.

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Proceedings of the Workshop on Extended Product Responsibility: October 21-22, 1996. (EPA530-R-97-020)

The proceedings from this workshop, sponsored by the President's Council on Sustainable Development and EPA, explain the basic principles of EPR and its application. The document includes case studies featuring EPR activities of various WasteWise partners including Xerox Corp., S.C. Johnson Wax Company, Safety-Kleen Corp., Ford Motor Company, and Monsanto Company. To obtain the document online see <www.whitehouse.gov/PCSD>.

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Product Stewardship and the Coming Age of Take-Back.

This report illustrates how some manufacturers made take-back programs a cost-effective, even profitable, part of their operations. The document describes Xerox, for example, which saved almost $200 million in its first 4 years by making take back and remanufacturing an integral part of its operations. Other case studies detail the experiences of Apple, Digital, Hewlett-Packard, IBM, Siemens Nixdorf, and Sony. This report walks companies through the decision-making process needed to set up take-back and recycling programs. The report can be viewed online at <www.cutter.com/envibusi/reports/prodstew.htm>. To obtain a printed copy, contact Cutter Information Corporation, 37 Broadway, Suite 1, Arlington, MA 02174.

Phone: 800 964-5125

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Sustainable America: A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future.

Published by the President's Council on Sustainable Development, the second chapter of this document includes endorsement of extended product responsibility. You can view this chapter online at <www/whitehouse.gov/PCSD> or contact President's Council on Sustainable Development, 730 Jackson Place, NW., Washington, DC 20503.

Phone: 202 408-5296

NATIONAL ORGANIZATIONS/ PROGRAMS

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EPA's Design for the Environment Program

EPA's Design for the Environment (DfE) Program, in the Office of Pollution Prevention and Toxics, encourages businesses to incorporate environmental information into their business decisions, and promotes the implementation of cleaner technologies, materials, and processes. The program is currently working with several sectors, including the printed wiring board, computer display, printing, garment and textile care, automobile refinishing, industrial laundry, and the foam furniture adhesives industries. For more information, contact Bill Hanson, DfE Program, U.S. EPA (7406), 401 M St. SW., Washington, DC, 20460.

Phone: 202 260-1678
Fax: 202 260-0981
Web site: www.epa.gov/dfe

The Center for Clean Products and Clean Technologies at the University of Tennessee, Knoxville.

The center's goals are to assist federal, state, and private institutions in their efforts to prevent and reduce pollution; to assess the performance, economic feasibility, and environmental benefits of cleaner products and technologies; and to provide students with opportunities to gain experience in the emerging field of pollution prevention. For information, please contact Gary Davis, The Center for Clean Products and Clean Technologies at the University of Tennessee, 600 Henley Street, Suite 311, Knoxville, TN 37996-4134.

Phone: 423 974-4251

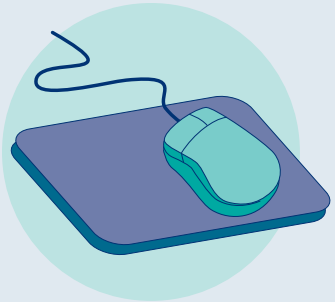
Web site: www.ra.utk.edu/eerc

President's Council on Sustainable Development (PCSD).

Founded in 1993 by President Clinton, PCSD endorses extended product responsibility as one of several principles of sustainable development. For more information, please contact David Monsma, President's Council on Sustainable Development, 730 Jackson Place, NW., Washington, DC 20503.

Phone: 202 408-5296

Web site: www/whitehouse.gov/PCSD



WEB RESOURCES

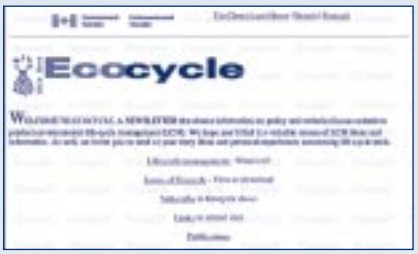
www.ce.cmu.edu/GreenDesign/

Carnegie Mellon University began a campuswide Green Design Initiative in 1992 to promote environmentally conscious engineering, product and process design, manufacturing, and architecture. Through the initiative, the university forms partnerships with industrial corporations, foundations, and government agencies to develop joint research and education programs that improve environmental quality while encouraging sustainable economic development. This Web site contains information on this initiative, published papers on extended product responsibility, current information on research and education, and links to related topics.

www.lu.se/IIIEE/research/products/epr/epr_old.html

This site contains a definition of extended producer responsibility, explanations for product responsibility, and a list of national and international publications discussing the topic. The site is maintained by The International Institute for Industrial Environmental Economics.

www.ec.gc.ca/ecocycle/



Environment Canada sponsors this Web site, which features an online newsletter, *ECO-CYCLE*. This newsletter shares information on policy and technical issues related to product environmental life-cycle management (LCM). Sample topics covered in the newsletter include integrated waste management, life cycle assessment tools, and measuring eco-efficiency in business operations. The site includes links to other related sites.

www.ecosite.co.uk

This Web site, "World Wide Resource for LCA" includes case studies, information on LCA standards, reviews of LCA software, and articles related to LCA.

www.cutter.com/envibusi

This Web site features the Product Stewardship Advisor: an online advisory service that provides news and strategies for lifecycle management of electronics and durable goods. To find out more information, please contact Cutter Information Corporation, 37 Broadway, Suite 1, Arlington, MA 02174.

Phone: 800 964-5125

Fax: 800 888-1816

EPA WASTE WISE pays off

Printpack Flags Film and Reduces Rubbish

EPR opened the door to a creative waste reduction policy at **Printpack, Inc.**, a WasteWise partner that manufactures soft drink bottle labels and other flexible packaging. Prior to its EPR policy, the company disposed of usable soda bottle labels along with defective labels during its quality control process. In an effort to reduce the number of usable labels being disposed, Printpack implemented a policy that calls for more accurate flagging and rolling off of defects in 'slitting' rather than 'slabbing'. As a result, the company conserved 300,000 pounds of polypropylene label film and saved nearly $500,000 in 1997. Implementation of the policy, which addresses polypropylene film defects, has reduced raw material waste from between 13 and 15 percent to between 10 and 13 percent.

Printpack prints soft drink labels on continuous rolls of polypropylene film that stretch thousands of feet. During printing, problems can occur that cause defects on the labels: colors can run light or be slightly off standard, print quality can be poor, printing plates can get dirty, or copy can be smudged on the labels. Labels with any of those defects are cut out of the film. Before Printpack implemented its new policy, slitter operators estimated the location of the defects, then cut the film in the general area of the defective labels—often cutting usable labels in the process. Under the new policy, upon finding a defect, the film is flagged at the beginning of the defective label string, then again at the end of the defective string. Pressmen then send the film to be cut. In addition, pressmen send defect logs along with the film that specifically describe the location of the flags (e.g., at 4,860 and 4,862 feet of film) and which stretch of film needs to be removed. This new careful cutting effort eliminates only defective labels and avoids unnecessarily cutting labels in good condition.

According to Wayne Taft, Environmental Coordinator at Printpack, Inc., "The $500,000 saved by the company combined with the avoided film waste is well worth the extra effort." For more information about Printpack's EPR policy, please contact Wayne Taft at 540 373-7251.

EPA

United States
Environmental Protection Agency
(5306W)
401 M Street, SW.
Washington, DC 20460

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