

# Recycling ...for the future



It's everybody's business

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*This brochure tells the stories of people across America who have helped make recycling one of our greatest environmental successes. But these stories are just the tip of the iceberg. Every day, thousands of communities, companies and organizations are pitching in to reduce and recycle waste. Their efforts help to strengthen our economy, protect our environment, and ensure a healthier planet for future generations.*

*Yet we must do more. Sorting our trash for recycling is the first step. But to close the loop, we must go the next step by putting recycled material back into productive use. The best way is to buy products made from recycled material whenever we can.*

*Recently, President Clinton signed a “Greening the Government” Executive Order strengthening federal efforts to “buy recycled.” You, too, can help. Please join me and the many other Americans who have taken the National Recycling Challenge and pledged to use more recycled products in our businesses and in our daily lives. Together, we can “close the loop” and write the next chapter in the recycling success story.*

**—Vice President Al Gore**

**O**ur goal as a nation must be to conserve our environment for future generations. Recycling is one easy, practical way each of us can do that every day. Thanks to the efforts of people like you, America already recycles 27% of its waste. Through the *National Recycling Challenge*, we aim to expand recycling across all sectors of the American economy and achieve a 35% recycling rate by 2005.

Your business, your community, your agency, and your institution can help by expanding an existing recycling program or by starting something new. When you join the *National Recycling Challenge*, you will be asked to register your commitment by agreeing to take actions in at least one of the following areas over the next year:

-  **Improve Efficiency in Recycling:** Reduce the cost of recycling for your organization or community.
-  **Bolster Community and Economic Development Through Recycling:** Start or expand recycling-related jobs programs, re-use programs, and innovative recycling financing programs.
-  **Bring Forward Innovations in Recycling Through New Technologies, Products, Policies, or Building Practices:** Increase sales or production of a recycled content product, increase recycling rates for your community/organization, use recycled content for the new products for a building, or recycle your construction and demolition project materials.
-  **Promote Designs for Recycling:** Design a product or process which increases recycling or product recyclability.
-  **Close the Recycling Loop:** Buy recycled content products, manufacture recycled content products, or become a steward of your product.
-  **Champion Outreach and Education for Recycling:** Conduct training on recycling and/or buying recycled to increase green purchasing.

We'd like to thank you in advance for participating in the *National Recycling Challenge* and encourage you to spread the word. Working together, we can achieve our goal, strengthen our economy, and leave our children and grandchildren a cleaner, healthier environment.

**George Frampton**  
Acting Chair, Council on Environmental Quality

**Fran McPoland**  
Federal Environmental Executive



# recycling for the future

## IT'S EVERYBODY'S BUSINESS

**T**he odds are that you already know a lot about recycling, and that you participate at home, at work, or both. "State of the art" recycling practices and programs are contributing to the phenomenal economic and environmental success of the set of inter-related actions which, together, we call "recycling." That success is built upon the daily actions at home and at work of millions of Americans, united in their dedication to work together to preserve the environment for our children. Vice President Gore issued the *National Recycling Challenge* on November 16, 1998—asking all Americans to renew their commitment to conserve America's natural resources for our children. "Working together, Americans have increased recycling by nearly 70% in six years," Vice President Gore said. "Today, there is even more that we can do. I am challenging everyone in our communities and all sectors of the economy to join with us in partnership to promote recycling and to buy and use recycled products."

This publication, together with a companion document, *Recycling...for the future: Consider the benefits*, detailing the economic and environmental successes of recycling in America, are resource tools for the *National Recycling Challenge*. This brochure is intended to provide each of us with some new ideas and concepts that have been proven to work, so that we can take them, adjust them, and experiment with them in our communities, businesses, and daily lives, as we accept the Vice President's *Challenge*. Just as an orchestra has many parts that have to work well together, so too do the various



components of recycling. In this publication, you will find a sampling of success stories of various components—all of which are needed to make recycling really work: Efficiency in Recycling, Community and Economic Development Through Recycling, Innovations in Recycling, Design for Recycling, Closing the Recycling Loop, and Outreach and Education for Recycling. Just like the balance and harmony among the instruments that make up an orchestra, the best recycling programs carefully incorporate and balance all components. No one part is more important than another, and none should be left out. As you prepare to join with those cited below in taking the *National Recycling Challenge*, think of how your town, your company, your institution, or your agency can weave together its recycling activities to fulfill the promise recycling holds for our children and the future they inherit from us.



## benefits of recycling

### Recycling 35% of our trash will:

- Conserve enough landfill space to serve the combined cities of Dallas and Detroit 92 times over.
- Save enough energy to fuel 6 million homes annually.
- Generate \$5.2 billion in raw materials for the economy every year.
- Expand recycling above the current \$100 billion and 1 million jobs in the American economy.
- Reduce global warming emissions equivalent to taking 36 million cars off the road.
- Stimulate exciting new products and technologies.
- Conserve our precious natural resources instead of relying on non-renewable resources to supply 94% of the economy's needs.



# efficiency in recycling

Pay-as-you-throw  
has helped  
Loveland, CO  
achieve high  
recycling rates  
since 1993



In order for recycling to work, municipalities and companies must continually find ways to drive costs out of their systems and improve the quality and quantity of recovered materials. In other words, we must continually strive to improve the efficiency of all recycling operations. Redesigning collection and processing systems to reduce overall costs and enhance the value of recovered materials is one of the first steps in improving efficiency. The use of full cost accounting to determine what waste collection and landfilling really cost, and the use of pay-as-you-throw systems to simultaneously focus attention on avoided disposal costs and create incentives for recycling and waste reduction, will also increase the efficiency of any recycling program. These efforts contribute to one of the central goals of the *Challenge*—to make recycling even more economically and environmentally sound.

The Pay-as-You-Throw (PAYT) waste collection fee system is an effective, market-oriented approach to reduce disposal and increase collection of recyclables by creating incentives for households and businesses to behave more efficiently. Under this system, residents pay for waste removal according to the volume of waste they generate for disposal. Because recycling diverts material from the waste stream and, thereby, reduces the community's overall waste disposal costs, recycling becomes a way for households and businesses to reduce their costs.

**Athens-Clarke County, GA**, home to the University of Georgia, documented a 48% reduction in the amount of solid waste disposed per residential household since FY92 as a result of implementing recycling and PAYT fee systems.

As one of the first county governments in the State of Georgia to implement PAYT, Athens-Clarke County took two years to transition from property taxes to monthly user fees for waste removal services. The PAYT program, begun in 1995, includes both residential and commercial sectors, and serves as a PAYT model locally, nationally, and even internationally.

Even if your community isn't ready for "Pay-as-You-Throw," there are other actions where efficient recycling saves money directly: sale of recyclables and avoided disposal costs.

From 1988 to 1994, garbage collection costs in Contra Costa County, CA, near San Francisco, more than doubled from a monthly average household bill of \$12 to \$26. At the same time, the California legislature mandated 25% and 50% waste diversion goals by the years 1995 and 2000, respectively. In response to the skyrocketing waste disposal rates as well as the state recycling mandate, five cities and the county formed the **Central Contra Costa Solid Waste Authority** to increase efficiency. This



**With a little thought,**

recycling can be easy even for small businesses generating non-conventional materials. Parker's Exxon in Washington, DC began recycling seven years ago in order to reduce its monthly trash bill. Today, the gasoline station pays \$40 less per month for trash disposal and has found markets for used oil and oil filters, spent antifreeze, tires, metal parts, and corrugated containers. It also trades in "core parts," such as water pumps, master cylinders, alternators, and brake shoes for rebuilding and purchases rebuilt and remanufactured parts for use in customers' vehicles.



single, regional agency solicited waste collection proposals from competing garbage and recycling companies for eight-year garbage, recycling, and yard clippings fixed-cost services contracts. As a result of rethinking the overall approach to waste management by consolidating contract administration, taking advantage of competition and economies of scale, and negotiating fixed cost contracts, the Authority's 100,000 residents experienced a 27% reduction in garbage collection costs in just two years, saving rate payers more than \$12 million annually. Each agency is now diverting between 37% and 54% of its waste from landfills by recycling.



## Recycling in multi-family housing offers challenges but also great potential to reach high concentrations of residents for education and participation.

Different types of housing in our communities can present challenges to recycling effectively and efficiently. Recycling in multi-family housing, for example, offers challenges but also great potential to reach high concentrations of residents for education and participation. It also allows for increased diversion of high quality recyclables without increased transportation costs. **Bellevue, WA** enjoyed one of the highest single family recycling rates at 61% in 1997, and perhaps the highest multi-family recycling rate as well. In 1998, multi-family housing residents recycled 21.7 pounds of recyclables per month per household. Bellevue's Neighbors for Recycling volunteer program trains residents to educate the community about recycling. More than 500 residents have participated in Bellevue's personalized outreach activities and today, 97% of multi-family buildings in Bellevue participate in recycling.

**George Washington University** constructed a new residence hall with environmentally friendly specifications, including a High-Rise Recycling System. This built-in recycling/trash compactor system allows residents to use the same chute for waste and recyclables, while a mechanism below separates the different recyclable commodities. This system allows for maximum efficiency and quality recyclables with minimal contamination.

When and where should you focus your collection efforts for maximum efficiency? You need to go either where the waste is or when it's there.

#### **Virginia Tech Recycling in**

Blacksburg, VA collected 50,000 pounds of corrugated containers during its "Student Move-In '98" by making corrugated collection sites available at dormitories and student housing facilities for the opening of the school year. **Madison, WI** diverted 24 tons of waste in one day by organizing and publicizing a convenient computer drop-off event.



**above and beyond...**

**Americans are nowhere near** the limit of recycling with our current 27% national recycling rate. Cities and counties in every corner of the United States are going way beyond this rate.

■ Falls Church, VA	67%
■ Hamilton County, OH	63%
■ Bellevue, WA	61%
■ Crockett, TX	54%
■ Burbank, CA	53%
■ Leverett, MA	53%
■ Ann Arbor, MI	52%
■ Palo Alto, CA	52%
■ Hennepin County, MN	48%
■ Chicago, IL	46%
■ San Jose, CA	43%
■ Colorado University	40%
■ Berea College, KY	30%



# community and economic development THROUGH RECYCLING

**A**s the American economy continues its remarkable and robust transition into the post-industrial era, more and more jobs and opportunities will be concentrated in the clean industries of the future. Community and economic development through recycling can, and should be, one engine of economic growth in our communities and is truly a focal point of the *National Recycling Challenge*.

Government at all levels is helping communities to create opportunities and jobs. **The U.S. Environmental Protection Agency (EPA)** developed the Jobs Through Recycling program to help communities to build an infrastructure to support new and existing recycling businesses which process, manufacture, and sell recycled content products. Communities can use their home-grown resource of solid waste as a feedstock for local industry. As part of this effort, EPA has awarded \$8 million in grants to 39 states, 4 multi-state organizations, and 5 Indian tribes. A review of results shows that community development grantees have helped recycling businesses create thousands of jobs, hundreds of millions of dollars in capital investment, and millions of tons per year of capacity for using recovered materials. A single project in California reports creating some 4,200 jobs, \$17 million in capital investment, and more than 8 million tons of material processed.

The **Veteran Affairs Medical Center** in Tomah, WI, uses a recycling program at the VA Hospital to provide job skills training to a diverse and motivated recycling crew. With the revenue generated from its recycling operation, various members of the Tomah community—including veterans with disabilities, homeless veterans, students, dis-



# opment

placed older workers, community service clients referred through the court system, and youth volunteers—are employed and trained in collecting, sorting, processing, and marketing recyclables. These highly transferable job training skills are key to self-sufficiency and a new beginning for many Americans.

**Chicago** focuses on economic development in the community by adding value to the waste stream, creating jobs, and supporting local businesses. Under the award winning **Chicago Housing Authority (CHA)** “Buy-Back” Program, the City “buys back” recyclable materials from low income residents in 13 family developments and 28 senior

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centers by compensating them with vouchers redeemable at local grocery stores. The city hires CHA residents to work on the recycling routes collecting materials. Last year, the program collected 645 tons of recyclable material, a 160% increase over the previous year.

In an innovative effort to provide “gap” financing to enterprises that have not attracted conventional financing, a unique partnership was formed between two non-profits, **Materials for the Future Foundation** and **Oakland Business Development Corporation**. The two community non-profits joined with the **Alameda County Source Reduction and Recycling Board** to establish the Recycling Revolving Loan Fund. The low interest loans allow recycling businesses both to finance business expansion and to catalyze start-up market activity. The Recycling Revolving Loan Fund was established in





1995 and has already loaned out \$1.8 million to 15 businesses, leveraged over \$4 million in partner financing, created or retained more than 450 jobs, and diverted more than 85,000 tons of materials per year. This is an excellent example of partnering in our neighborhoods by using public funds, administered by local non-profits, to create jobs and investment in the local community. One project alone, **Pacific Steel** in Berkeley, CA received a \$150,000 loan and leveraged another state loan of \$700,000 to purchase a sand recycling system for the mold making process at the foundry. This allowed for the creation of 5 new jobs, retention of 350 jobs, reduction of annual sand purchases by 85%, and diversion of 8,000 tons of materials from disposal to recycling.

Every day, recycling is creating jobs in our communities. Based on a study for the U.S. EPA, it is now estimated that 1 million Americans are working in recycling and remanufacturing jobs in the United States, generating more than \$100 billion in revenue in the economy.

Many of these jobs in recycling and remanufacturing have been in our communities for decades. Perhaps we don't immediately think of them as part of the recycling industry, but they are! For example, consider the company rebuilding water pumps or engines for cars. More recently, consider how many computer rebuilding, re-furbishing, and resale companies have popped up. Many people correctly regard the recycling and remanufacturing industries as the "hidden giant" of the American economy.

**Cardone Industries, Inc.** of Philadelphia, PA supplies remanufactured automotive products, including a full line of brakes, electronics, motors, pumps, and steering, ride control, and drivetrain components. Typically, a vehicle part such as a water pump has internal parts housed within a metal or other casing; the internal parts wear out and need to be replaced, while the housing does not. Remanufacturers refurbish the entire part. What started out in 1970 as a four-man operation with one product line has expanded until Cardone has over 3,800 employees, 39 product lines, and 2.5 million square feet of remanufacturing operations. Its remanufactured products are built to the same quality standards used to manufacture new parts. Consequently, Cardone provides a better value to vehicle owners by offering remanufactured vehicle parts as much as 30% to 50% below the cost of new parts. By extending the life of products through remanufacturing, Cardone is recycling thousands of pounds of natural resources, saving energy and greenhouse gas emissions by keeping parts out of the resmelting process longer, and keeping products out of landfills.

Communities and citizens also benefit directly from reuse of recyclables. Redistribution of used material is considered by many to be the most efficient and highest end-

use of a used commodity, due to the reduced energy and infrastructure required to recycle the product. From the smallest towns on the East coast to the largest cities on the West coast, everybody can reuse materials, and everybody can benefit. Consider just two examples.

The "Take It or Leave It" reuse program in **Leverett, MA** recycles clothes, books, paint, appliances, toys, paper bags, tools, furniture, and other used materials and redistributes these commodities back into the community. It supports local enterprises ranging from nurseries to farmers, small crafts operations, and other local businesses with plastic planting pots, cardboard egg crates, packaging materials, paint, and used oil. In addition to its redistribution program, this small town with a population of 2000 has achieved a 60% recycling rate.

Likewise, **LA SHARES**, the world's largest non-profit materials reuse program, has diverted more than 7,000 tons of materials from overloaded local landfills and collects from more than 800 participating businesses. As a result, more than \$15 million in desperately needed equipment and supplies have been provided to more than 2,500 non-profit organizations, schools, and churches.



#### **Recycling not only saves**

lots of resources, it can even be a tool to save lives. U.S. Steel's "Gary Works" in Indiana recycled more than 500 guns, including dozens of rifles, sawed-off shot guns, semi-automatic weapons, and hundreds of hand guns into refrigerators, cans, cars and even framing for new homes. Many of these firearms had been used in crimes. So what was once an instrument of crime is now a weapon of economic development.





# innovations in recycling



The National Park Service constructed the viewing platform at the Old Faithful geyser from plastic lumber

**N**ew processes, new designs, and targeted research and development to enhance all elements of recycling are essential building blocks of the *National Recycling Challenge*. Innovation can take many forms, whether in new technologies, creating or requesting new products, helping to shape new policies, or adapting recycling to building projects. The *Challenge* is designed to stimulate innovative recycling programs throughout the United States in all four areas. Such innovations reap additional rewards beyond recycling in areas as diverse as educational opportunities, job skill enhancements, and new ideas and products which benefit us at home and in the workplace. First, consider innovative technologies and products.

Many plastic objects are difficult to recycle because the type of plastic is hard to identify. It is important to separate the various types of plastics from each other because even a small degree of contamination in recycling facilities by look-alike, but incompatible, plastics can ruin an entire load of recovered material.

A device called the RP-1 Polymer Identification System—developed by chemists at Purdue University and marketed by **SpectraCode**—promises to change all that. The instrument works like a bar-code reader that “reads” the molecular structure of the material itself. The system is helping to recover some of the billions of pounds of mixed plastic that we lose to landfills and incinerators every year. The system takes less than one second to identify a piece of plastic, meaning that one sensor has the potential to sort through 500 tons of material a day.



But what about recyclables mixed in with municipal solid waste? The **U.S. Department of Energy** has awarded a Small Business Innovation Research grant to **National Recovery Technologies, Inc.**, to do research and development on computer robotics to recover recyclables from waste intended for landfills. The technology allows for a human operator to guide the sorting process while the drudgery of the physical sorting labor is assigned to a robotic machine. With the RoboSort™ unit, testing has shown sorting rates of two to three times greater per person than with hand sorting. Two pilots are under way to use remote handling equipment to recover recyclables and reduce direct human contact with the waste.

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What should vehicle owners who change their own motor oil do with all those empty plastic lube oil containers? Remember, there is always a little bit of oil remaining in the bottle. **AlliedSignal Federal Manufacturing & Technologies** in Kansas City developed a process that recovers clean oil from the “empty” container and turns the container into chips for resale. Through a licensing agreement with **Fix-Corp. Recovery Systems** for rights to the oil and plastic separation process, a prototype recycling unit is

currently in operation in California. Based on an estimate of more than 2 billion quart-sized plastic containers used in the United States each year, 230 million pounds of discarded plastic and 14 million gallons of oil could be diverted from landfills. And even better, the plastic is to be used to fabricate one-piece 100% postconsumer recycled plastic pallets for use in shipping and storage. Now that's innovation in finding a new use for an old waste!

A number of companies and other institutions have devised unique ways to solve the problems presented by the glut of packing materials. Innovative recycling technology developed by the **U.S. Department of Agriculture's Forest Products Laboratory** and licensed to **Gridcore Systems International**, of Long Beach, CA, uses old corrugated containers (OCC) and other recycled fibers to make strong, light-weight, honey-combed, engineered panels for use in furniture, and as interior walls, shelving, and packaging. The **U.S. Postal Service** arranged for Gridcore to produce 5,000 recycling containers from undeliverable standard mail. The containers will be used in post office lobbies to collect recycled mail and other waste paper.

Innovation doesn't have to be limited just to high technology or products. Innovative policies and practices are needed to meet the challenges of recycling. The **University of Wisconsin-Madison**, implementing a state recycling law, demonstrated how legislative innovations can help grow a nationally recognized recycling collection program. The state law bans certain recyclables from landfills and creates a strong market environment for recyclables. During 1997 alone, the university generated more than \$125,000 in revenue from recyclables and saved \$92,000 in avoided landfill fees! With policies like this, recycling can pay, even during periods of low market value.

Local considerations will often influence the kind of innovative recycling policy needed. **Chicago** generates more than 55% of its waste stream from businesses and high-density residential buildings. Those sources of waste present both challenges and opportunities. In 1995, Chicago enacted an unprecedented high-density residential and commercial recycling ordinance, which requires owners of these buildings to recycle at least three materials or at least two materials if they also carry out at least one source reduction measure. To boost compliance and achieve more recycling, the City also helps businesses by conducting training seminars and offering recycling grants to the local chamber of commerce. The recycling rate for multi-family, residential, and commercial buildings jumped from 28% to 38% as a result of this innovative policy. Last year, the



City amended the ordinance to encourage businesses to recycle fluorescent and high-density discharge light bulbs. In just one year, more than 86 tons of light bulbs were collected—enough to light a building 123 stories tall!

In addition to its recognized “Pay-as-You-Throw” program, **Athens-Clarke County, GA** established an innovative funding mechanism for its recycling collection program. The County established a “put-or-pay” recycling contract with the private owner and operator of the Recovered Material Processing Facility (RMPF). Under this unique public-private RMPF partnership, Athens-Clarke County owns the land where the RMPF is

By undertaking environmentally and economically sound building construction and deconstruction practices, programs have converted what would have been thousands of tons of waste into a valuable commodity.



located and is required to put 775 tons of recyclables per month into the recycling facility or pay for any shortage. In exchange, Athens-Clarke County receives an 80% share of the revenues generated from the sale of the recyclables delivered, which reduces its overall costs. The County generates an annual \$200,000 in revenue from the sale of recyclables.

The amount of waste generated in a typical home improvement project or remodeling project is staggering. Building-related construction and demolition debris accounted for 136 million tons of waste generated in 1996. By undertaking environmentally and economically sound building construction and deconstruction practices to facilitate

recycling, the following programs have converted what would have been thousands of tons of waste into a valuable commodity, while saving money and generating jobs. The *National Recycling Challenge* will stimulate new innovations in this area.

The **City of Los Angeles** is reducing waste and promoting recycling on construction and demolition projects. Since 1992, the City has conducted technical assistance, educational outreach, and best management practices programs for various city agencies to recycle construction, demolition, and land-clearing (CDL) materials. Outreach activities focus on city departments and the private sector building industry, and include one-on-one planning for project recycling programs, distribution of technical resource guides, seminars, and membership in industry organizations. The City developed a specification for recycling CDL materials on all Department of Public Works projects. This specification has served as model contract language for major private sector developments and municipalities throughout the United States.

The Los Angeles program has influenced dozens of major developers to recycle. The **Playa Vista** entertainment, media, and technology district, for example, recycled nearly 75,000 tons of CDL materials during the demolition phase, achieving a 92% recycling rate. The **Staples Center Arena** recycled more than 15,000 tons of CDL materials during site development, achieving a 98% recycling rate. Los Angeles has produced a "Construction and Demolition Waste Recycling Guide," which lists more than 115 construction and demolition materials recycling companies, and a "Resource Guide to Recycled-Content Construction Products," which lists more than 125 manufacturers.

The **Tennessee Valley Authority (TVA)** established the Sustainable Architecture Program to minimize the negative environmental impact of building renovation and new construction. One of its key components is finding markets for used building materials. To date, TVA has sold, donated, or reused \$9.25 million of used building materials and purchased \$7.8 million of building materials that meet sustainable criteria.

"Helping to save the planet—one building at a time by creating living wage jobs to recover and sell quality reused building materials" is the mission of the **Green Institute's** Deconstruction Services. Located in Minneapolis, MN this firm has successfully reconstructed houses and commercial buildings, thereby saving tons of waste from landfills and thousands of dollars to clients. Items reclaimed and recycled range from lumber to carpeting, from cabinets to appliances. The organization is committed to "urban development through sustainable enterprise, job creation, and environmental education."

Proving that “green” is good business, an innovative eco-smart hotel opened in Philadelphia on January 27, 1999. The **Sheraton Rittenhouse Square Hotel** is located in a building renovated under the direction of **EcoSmart Healthy Properties, LLC** and takes a note from eco-hotels, which have long been popular in Europe, offering guests a wider variety of environmental amenities than just “smoke-free” rooms. Many U.S. hotels have offered recycling or energy and water conservation for years, but this new Sheraton contains other environmental attributes, too. For example, the lobby floor is constructed with a material containing 93% recycled granite, the night tables are made

Proving that “green” is good business, an innovative eco-smart hotel opened this year and uses recycled content products, including tables made from recycled pallets.



from recycled shipping pallets, the carpet padding contains 100% recycled materials, and worn carpeting will be recycled after removal.

Using plastic lumber in place of wood in building applications can provide significant markets for recovered plastics. The **National Park Service** used the equivalent of 4 million plastic milk jugs by constructing the 30,000 square foot viewing platform at the Old Faithful geyser in **Yellowstone National Park** from plastic lumber. And the **Army Corps of Engineers** worked with **Fort Leonard Wood, MO** to replace a wooden bridge with a plastic lumber bridge, which used approximately 13,000 pounds of mixed plastics. The bridge is expected to last 50 years, compared to the 15-year life of wood bridges.



# case studies

**T**he University of Colorado at Boulder has created one of the most successful university recycling programs in the nation. Although the landfill tipping fee is only \$20 per ton, the University still succeeds in diverting 40% of its academic and administrative waste stream. The University recently retired the debt on its \$500,000 recycling facility with its accrued disposal savings.

The recycling program at the University of Colorado was launched as a student enterprise in 1976. In 1990, a Student-Administration Partnership for recycling was formed. Students staff the on-campus recycling processing center, prepare materials for market, manage recycling contracts, and coordinate campus outreach for the program. Facilities Management employees coordinate a convenient desk-side program, collect recyclables, and operate an efficient trash disposal operation. In addition, over 15 internships, independent studies, and class projects are sponsored each year.

The University of Colorado was a founding member of the College and University Recycling Council. CURC is affiliated with the National Recycling Coalition and represents over 180 university recycling coordinators nationwide. The group maintains an active web site and listserver, facilitates discounts on recycling equipment and recycled products, and conducts regional workshops.

The University of Colorado is among a growing number of schools which are restructuring waste management, empowering students, and harnessing purchasing power.

University  
of Colorado



**T**he United States Postal Service (USPS) is one of the nation's leading recyclers, purchasing more than \$160 million worth of recycled content products every year. Postal purchases of paper and paper products must meet or exceed minimum materials content standards, ranging from 20% to 50% recycled content. Laser toner cartridges and toner ribbons also contain recycled content (and cost 50% less than non-recycled content products). USPS uses four million recyclable plastic pallets, and new hampers and mail containers contain 50% recycled material. Even the waste containers for recyclable mail at the USPS's 20,000 recycling locations are themselves recyclable and made with recycled content.

USPS is a national leader in the use of re-refined oil and retread tires in its fleets. More than 100,000 postal vehicles currently use re-refined oil, and USPS purchases more than 100,000 retread tires annually.

USPS also uses recycled materials in its retail products, including stamps, pre-stamped envelopes, postal cards, packaging materials, and Express and Priority Mail envelopes. USPS also has developed innovative programs to make pencils and compost from recycled mail. Due to the success of its recycling program, USPS's former disposal expense has become a revenue generating business. Last year, USPS recycled 60%—or one million tons—of its waste stream and generated more than \$8 million in recycling revenues and cost avoidance through reduced trash hauling.

To close the loop, commodities such as toner cartridges, polystyrene packaging, circuit boards, wiring, video/audio cassettes, and paint cans, in addition to traditional recycled materials, are collected in recycling programs across the nation.

USPS has become a national advocate of recycling. It sponsors numerous recycling promotions throughout the United States, including Clean Your Files Day and America Recycles Day.

**K**ing County is recognized nationally for its cutting edge, comprehensive approach to recycling. Its Environmental Purchasing Program promotes recycled content purchases within the County government. Its Commission for Marketing Recyclable Materials establishes partnerships and infrastructure for consumers, businesses and other governments to buy recycled. And its Solid Waste Division assists schools, businesses, and residents with waste prevention and recycling.

Closing the loop is King County's forte. The county itself has purchased more than \$2.5 million worth of recycled products, resulting in a \$600,000 savings. The county's 12,000 employees and its contractors are trained on the procurement policy requirements and how to buy recycled. Not only does the County use re-refined oil in its own fleets, but through its winning "Shift Gears" program, 9,000 motorists and 125 auto service shops were inspired to try re-refined oil.

King County's environmental purchasing web site and frequent "Procurement Bulletins" serve as resources for procurement officers and recycling coordinators nationwide.

King County's focus on "Building for the Future" inspired the Kingdome stadium to use recycled lumber to secure the artificial turf. The County's Construction Works program assists construction firms with waste prevention, recycling, and sustainable building practices. King County's most recent product innovation involves recycling 18 tons of glass into a pool filtration medium at the King County Aquatics Center, a pool where the U.S. Olympic Trials will be held next year.

Over 80% of County residents participate in curbside recycling, resulting in a 50% diversion rate by 1995. At least 400 community volunteers have been trained in King County's Master Recycler Composter program. And 24,000 preschool through high school students are reached through King County's School Education Program.

King County,  
Washington



**W**ith more than 41 million telephone access lines, 7 million wireless customers, and 142,000 employees worldwide, Bell Atlantic provides advanced wireline voice and data and wireless services. It also is the world's largest publisher of directory information. In 1997, Bell Atlantic purchased 110,000 tons of directory paper with more than 30% postconsumer recycled content, which provided a market for over 33,000 tons of waste paper. Bell Atlantic has set a target of 40% postconsumer recycled content in its publication by 1998, which will provide a market for 44,000 tons of waste paper.

In 1997, Bell Atlantic recycled more than 11 million pounds of paper, 53,000 pounds of plastic, 43.2 million pounds of metal, and 103,000 pounds of wood. Each year, it saves \$760,000 on waste removal costs as a result of its office paper recycling program. Bell Atlantic also generated \$37.5 million in 1997 from the sale of recycled metals separated from surplus or obsolete telecommunications equipment that was not reused, repaired, or sold.

When Bell Atlantic and NYNEX merged in 1997, the company collected 45,000 pounds of old plastic signage from public phone booths for recycling. The company will continue to collect old signage until all 967,000 pounds are gathered.

Bell Atlantic also changed its annual shareholders report from a high gloss, magazine-type publication to a "Plain Jane" facts and figures only report printed on recycled content paper. While the cost of the recycled content paper used in the publication was higher, the cost of production was lower, so Bell Atlantic still saved \$1 million. Bell Atlantic also negotiated with its supplier to reduce the cost of the recycled paper. Subsequently, all shareholder information, dividend checks, and reinvestment statements were printed on recycled paper.

# design for recycling



**C**orporate product responsibility often includes designing products to be recyclable. Early planning for recycling opportunities during the initial design of products and the production or construction process can quickly expand the amount of materials recycled and make the inter-related recycling processes work much more smoothly. "Design for Recycling" focuses on setting up processes to enhance production, reduce waste, reclaim resources, protect the environment, and benefit the public. Designing products and processes for recycling can help to reduce recycling costs and is pivotal to the success of the *National Recycling Challenge*. Design for recycling practices include designing products and packages so they can be easily recycled; designing collection and processing systems to maximize recovered material commodity values; and designing products to include recycled content. Here are just a few examples.

**Compaq Computer Corporation**, the largest global supplier of personal computers, now designs its products to minimize their impact on the environment. Design for Environment/Recycling serves as a strategic tool at Compaq for product planning, design, and manufacturing to develop products that are energy efficient, easily upgradeable, recyclable, and reusable. By the time new products come off the production line or prototypes are being tested, Compaq designers have taken into account the entire life cycle of the products. Today, with several million computers shipped annually, Compaq takes additional measures to reduce waste by building its computers to be recyclable, uses recyclable plastics, labels recyclable parts, and designs components to make them easier to disassemble and recycle.



Led by members of its Recycling Action Team, **Ford Motor Company** is the first vehicle manufacturer to issue worldwide automotive recycling guidelines to its engineers and parts suppliers outlining ways to design autos for recycling disassembly.

Ford's Sheldon Road Plant in Plymouth, MI is the first known automotive plant to design its process to use recycled content plastic resin for all of its output, using 5 million pounds of recycled plastics annually to produce 24 million air conditioner parts for cars and trucks. Ford has taken the lead on the use of recycled materials for other vehicle components also. Ford uses more than 50 million soda bottles annually to manufacture grille reinforcements, window frames, and trunk carpets. These represent enough bottles to cover a 400 acre lake from shore to shore. More than 27 million square feet of nylon carpeting are recycled and used annually in the production of engine cooling fan modules and air filter assemblies used in Ford automobiles. This is enough used carpet to cover every floor of the World Trade Center and the entire U.S. Capitol



**Recycline, Inc., a retailer of**

high-quality recycled products, has developed a product that protects our teeth and the planet. The handle of the Preserve<sup>®</sup> toothbrush is made from recycled polypropylene and incorporates a unique design to facilitate its recyclability. The three ring gripping section is part of the plastic handle, rather than a separate rubber component, which allows the product to be easily recycled. Recycline provides a postage-paid return envelope for customers to send in their old Preserve<sup>®</sup> toothbrushes for recycling into plastic lumber. At replacement rates of 2 times a year, toothbrushes represent over 100 million pounds of plastic waste a year that could be avoided. Now that's something to smile about.

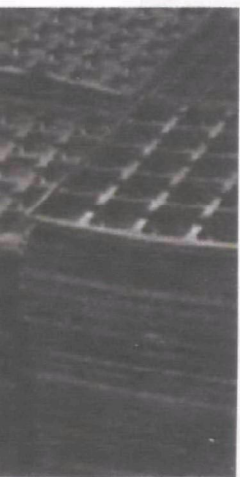
Building complex. Ford also is the first company to manufacture its test vehicle fleet with recycled parts.

**Wellman, Inc., Bosch, and Ford Motor Company**, partnered to develop and used the first postconsumer nylon engineering resin derived from carpet into car parts. EcoLon<sup>®</sup> was introduced in a fan and shroud for Ford's 1997 Windstar, meeting all quality and cost requirements. This accomplishment allowed 1.6 million square yards of carpet to be diverted from landfills in 1997. This year, Ford's expanded use of EcoLon<sup>®</sup> in various car parts will prevent 24 million square yards of carpet from being landfilled.

In addition to designing products to be recyclable, manufacturers are changing policies, procedures, and even sales approaches to increase product recycling. **Interface Inc.** uses a stewardship approach to furnishing carpet to customers by treating flooring materials as a "product of service." By the Interface definition, carpet is a "floor covering service," rather than a purchased commodity. Under the Evergreen program, Interface clients lease carpet rather than buy it, and Interface remains responsible for its upkeep, removal, and reclamation, removing old carpet for recycling and replacing it with new carpet indefinitely. Interface recycles the old carpet by pulverizing it and separating out its key components, nylon and vinyl. The vinyl is recycled into new carpet backing. The nylon is processed by outside companies who convert it into raw material for automobile parts.

**Motorola** manufactures a wide variety of pagers, and each model had its own component-unique packaging—an expensive feature which also required a lot of attention to inventory. This packaging typically consisted of a plastic tray made of high-impact polystyrene—a material that is not readily recyclable—along with other surrounding protective packaging.

Because unanticipated shortages of particular styles of the multiple types of packages were interrupting production, a team set out to reduce costs and at the same time reduce the impact of the packaging on the environment. The team designed a new multi-use tray that would hold several different styles of pager housings. During the tray design process, the team also considered the overall impact to the environment. The new tray is manufactured from 100% postconsumer recycled high-density polyethylene, which, in turn, helps create a demand for recycled plastic in communities surrounding Motorola's manufacturing facilities.



Motorola designed a new multi-use tray that would hold several different styles of pager housings and is made of recycled plastic.



Motorola also made the trays lighter and thinner, reducing the amount of material used. The new trays require less than 50% of the material that was needed to manufacture the old trays. Motorola combined the lighter multi-use tray, a central database for scheduling packaging and production needs, and an effective reuse system to create the Compack packaging management system. The system significantly reduces costs, increases efficiency, reduces packaging waste, and absorbs collected plastics from recycling programs in surrounding communities. Implementation of this system resulted in a savings of \$4.1 million in 1997 and eliminated a minimum of 250,000 pounds of packaging waste.

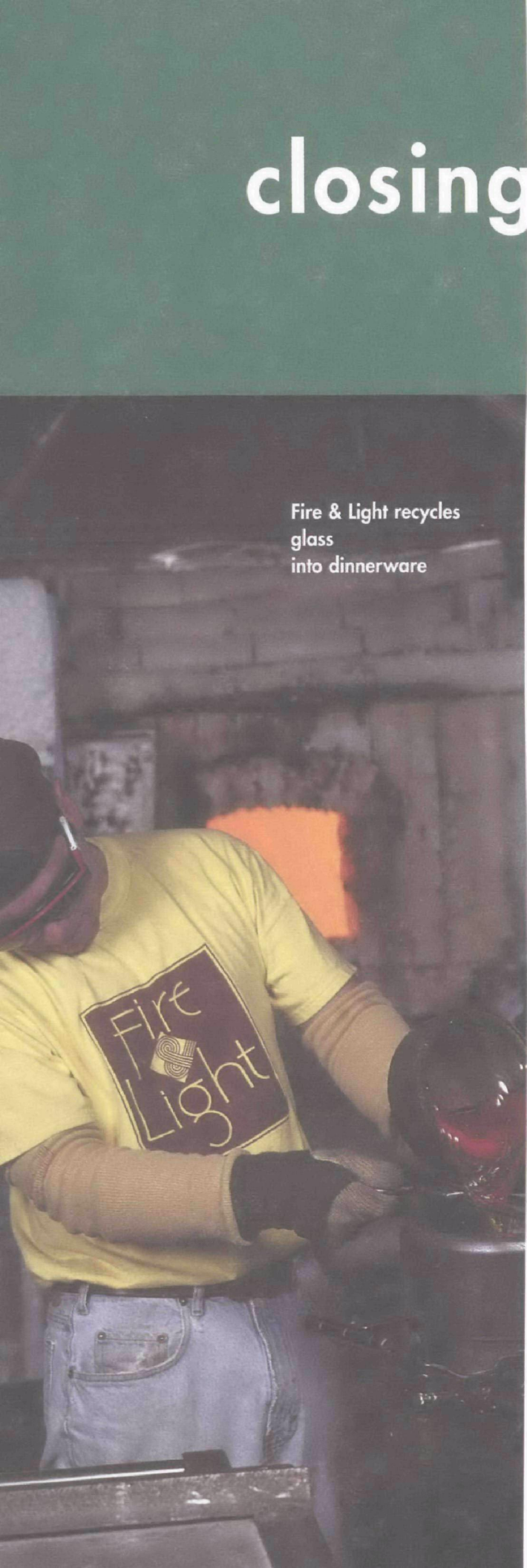
An increasing number of adhesives from pressure sensitive labels and stamps, glues used on product samples, and other sources are contaminating otherwise recyclable paper. Recognizing that its self-adhesive stamps are popular with customers but a contaminant to paper recyclers, the **U.S. Postal Service's Postage Stamp Research and Development Program** is developing pressure sensitive adhesives (PSA) and stamp requirements that minimize environmental impacts by reducing waste and increasing recyclability. To date, the Postal Service has developed a PSA stamp coil constructed without a backing liner and is completing research on environmentally benign stamp adhesives. This year, the Postal Service plans to issue a stamp printed on 20% postconsumer recycled content paper and using the benign adhesive. It also plans to expand the use of the new PSA to other Postal products and office products.

The **UltraLight Steel Auto Body (ULSAB) Consortium** was formed by the steel industry to reduce the weight of steel auto body structures while maintaining their performance, safety, and affordability—and continuing the steel's recyclability. The ULSAB structure is 36% lighter than comparable vehicles and the light truck structure for sport utility vehicles and light-duty trucks is 19% lighter. Both designed structures have no adverse impact on the recyclability of the steel and demonstrate improved performance above and beyond manufacturers' performance standards.

To target new product design for recycling initiatives, **IBM** analyzes data identified during the demanufacturing of computer equipment. Lessons learned at the end of a product's life are communicated back to designers, enabling IBM to better design its products for recyclability. Design guidelines include coding of plastic parts to promote recycling, eliminating hard-to-remove labels and foams, minimizing plating and painting of parts, minimizing the quantity of different materials used in a product, and avoiding the use of incompatible materials.



# closing the recycling loop

A photograph of a person wearing a yellow t-shirt with a 'Fire & Light' logo, working with molten glass in a furnace. The person is wearing a dark cap and gloves, and is focused on their work. The background is dark and industrial, with a bright orange glow from the furnace.

Fire & Light recycles  
glass  
into dinnerware

**T**he three chasing arrows in the recycling symbol reflect the three elements of the recycling system—collection, processing, and buying recycled content products. When we think of recycling, however, we usually think only about putting recyclables at the curb or a drop-off center. Limited markets for recyclables often present the greatest barrier to successful, economically sustainable recycling. When consumers and purchasing officials do not request recycled products, manufacturers can not continue to produce them. As a result, recycling coordinators are unable to successfully and efficiently “close the loop” with the materials they collect, because markets for those materials shrink. By reinforcing the need to both manufacture and buy recycled content products, we not only support our community recycling programs but also American businesses.

Producing and purchasing recycled content materials are merely “flip” sides of the same coin—and that coin is the same one that pays for *your* recycling program. Government, industry, institutions, and each of us as individuals and consumers—both at work and at home—need to commit and take on the *Challenge* to build a stronger marketplace for recycled goods. When we purchase a recycled content product, we are making a contribution to reducing energy consumption, reducing pollution, building new business opportunities, and conserving more of our natural resources for our future generations.

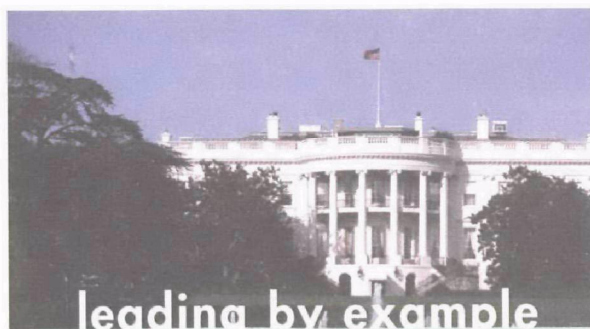
In this section, you will see how communities, businesses, institutions, and agencies have aggressively pursued buying recycled products; collected recyclables

for production; produced highly useful, economic everyday products for our homes and businesses; gone a "next step" into cooperative and joint ventures that unite communities and manufacturers/end-users to collect, market, and utilize recyclables; or gone the extra mile to becoming an active steward of their product throughout its life-cycle. You, too, can use your buying power in the marketplace and make the goals of the *Challenge* a reality.

## **PURCHASING**

The Federal government has made great progress in expanding markets for recycled content products, especially paper. When **President Clinton** signed Executive Order 13101 last September, he committed the entire Federal government to use printing and writing paper containing a minimum of 30% postconsumer recycled fiber. Prior to the signing of the new Order, use of recycled content paper had risen from 19% in 1995 to close to 70% in 1998.

The **Warner Bros. Studios Facilities** located in Burbank, CA offers



### **"As the nation's largest**

paper purchaser, the Federal government has a special responsibility to lead the way in building markets for recycled goods. Since 1993, when I signed an earlier Executive Order to promote recycling, we have quadrupled our purchase of recycled content paper. Today, we are going the next step. I am directing agencies to ensure that as of January, [1999] they will purchase only recycled paper. Through this single action, we will save hundreds of thousands of trees, reduce air and water pollution, and curb emissions that contribute to global warming. We will also harness our tremendous purchasing power to support the growing market for recycled products."

**—President Bill Clinton**



a good example of organizing to buy recycled products. The company-wide Environmental Purchasing Policy instituted in 1993 requires all paper purchased by Warner Bros. to contain 20% or more postconsumer recycled content. Colored paper, script covers, file folders, hanging file folders, storage boxes, envelopes, adding machine rolls, Post-it<sup>®</sup> notes, pencils, remanufactured toner cartridges, and a host of other office supplies all contain recycled content. Most janitorial paper supplies are non-bleached and have recycled content—many up to 95% postconsumer. Other recycled content items purchased include automobile parking stops, re-refined oil for the entire fleet, and plastic lumber truck stakes for production vehicles. In some building renovation projects, Warner Bros. used drywall, sub-flooring and flooring materials, insulation materials, and bathroom partitions containing recycled content. In order to measure progress, Warner Bros. tracks purchases on monthly reports and continually trains buyers on the policy and how to implement it in balance with price, performance, and other criteria.

Sometimes a little help is needed to make good things happen, like in the City of Ann Arbor, MI. The **Ann Arbor Solid Waste Department** set up a \$50,000 annual grant program to fund expanded uses of products made with recycled materials by other City departments. Since 1994, the City has committed nearly the full \$50,000 each year to support worthwhile, cost-effective projects to purchase recycled products such as traffic cones, picnic tables, benches and bleachers, welcoming mats, carpeting, floor and ceiling tiles, office supplies, boat docks, fishing piers, boardwalks, and even recycled plastic kayaks. The Ann Arbor Solid Waste Department knows that by supporting manufacturers of recycled content products, it is helping its own recycling collection programs.

Academic and other institutions also are excellent models for buying “green.” The Environmental Contract Management program at **Rutgers University** uses purchasing to take the lead in environmental achievements. Contracts encourage manufacturer and vendor take-back programs and elimination and reduction of packaging. Under this program, each of the University’s contracts have been revised to contain language stipulating the vendor’s responsibility to minimize or remove wastes. A model contract is available for similar institutions to emulate this innovative approach to procurement. Rutgers also benefits from recycling contracts, saving nearly \$2 million in 1993 by recycling instead of landfilling.

Rutgers' purchasing office also redesigned its procurement process to engineer in recycling. For example, its road and sidewalk maintenance contract requires that roads and sidewalks contain recycled materials, including material recovered during rehabilitation of existing pavements. Recovering this material avoids landfilling costs.

What about a concentrated national program? Did somebody say **McDonald's**?<sup>TM</sup> Talk about buying power. In 1997, **McDonald's McRecycle USA**<sup>®</sup> program reached a significant milestone. The program, which was launched in 1990, surpassed the

Modern re-refining removes all impurities from used engine oil, producing a product that meets or exceeds the same standards as virgin oils.



\$2 billion mark for purchasing recycled content products for use in U.S. restaurants. In 1996 alone, McDonald's bought \$369 million worth of recycled products in the United States, a 13% increase since 1995. McRecycle USA<sup>®</sup> is now averaging \$265 million annually—almost three times the original commitment of \$100 million per year.

As part of its 1998 Earth Day Buy Recycled promotion, **Boise Cascade Office Products** offered its customers up to an 80% discount on over 100 recycled content office supplies, and an additional 40-50% discount on other recycled content products. The company's 10,000-item catalog now features more than 1,400 recycled content products, up from 68 featured products in 1991.

Modern re-refining removes all impurities from used engine oil, producing a product that meets or exceeds the same standards as virgin oils. **Safety-Kleen Corporation** and the **Defense Supply Center Richmond (DSCR)** teamed up to combine the sup-



ply of re-refined lubricants with the collection of used oil. This closed-loop program supplies re-refined oil and, as an added value, provides the customers with pick-up of their used oil. The closed-loop program reduces costs by eliminating the need for two contracts—one for buying re-refined oil and one for disposing of it. Also, this program specifies that the used oil will be re-refined, which allows the oil to be used repeatedly. Since the program was initiated in June of 1997, some 90,000 gallons of oil have been picked up and re-refined.



Recovered paper now supplies 36.5% of the American paper industry's fiber needs and is used in all types of paper products, from office papers to newsprint to tissue products to paperboard and packaging.

#### **MANUFACTURING WITH RECYCLABLES**

Recovered paper now supplies 36.5% of the American paper industry's fiber needs and is used in all types of paper products, from office papers to newsprint to tissue products to paperboard and packaging. At **Union Camp's** Fiber Recycling Plant in Franklin, VA, more than 400 tons of mixed office paper, the equivalent of 80 million sheets of 8.5" x 11" paper, can be processed daily. From that, 300 tons of 100% post-consumer pulp is made for producing recycled content business and printing papers and bleached paperboards. Union Camp recently increased the recycled content of its Great White<sup>®</sup> office papers to 30% postconsumer to meet federal purchasing requirements. In 1997, to increase markets for Great White, Union Camp started the Great White Consumer Products Business<sup>™</sup>, which sells to home and small office paper

users who make their purchases through retail outlets, mail order catalogs, and via the Internet.

**Fire & Light** of Arcata, CA, devised a solution to where to send the glass collected in its rural community. The company is using crushed glass cullet from bottles collected by local recycling programs to create plates and bowls. By recycling glass into beautiful dinnerware, Fire & Light creates a market for 1,000 pounds of recycled glass a day.

Waste building materials are also finding a new life. **Waste Reduction Products, Corp. (WRPC)** of Goldston, NC, recycles the large flow of wallboard scrap generated by the mobile and modular home factories located in the state. Commercial and residential builders are now working with community landfill operators to segregate and collect wallboard scrap. The WRPC recycling plant processes this scrap into gypsum materials suitable for use in home gardening, lawn care, golf course maintenance, spill absorbents for industry, animal waste management, and cat litter.

A number of manufacturers have been aggressive in using recycled materials for manufacturing carpet. Since 1991, **Talisman Mills** of Mequon, WI has been manufacturing Envirolon™ carpet with fiber created from the plastics in soda bottles. The product has been in use in high traffic areas such as the **Hennepin County Convention Center** in Minneapolis, MN and the **Department of Housing and Urban Development** headquarters in Washington, DC. **Collins and Aikman** floor-coverings of Dalton, GA is recycling old carpet to make backing for new carpet which outperforms virgin materials and is covered by a 15-year warranty. There are now thousands of installations worldwide, including Fortune 1000 companies, using the carpet. Companies purchasing carpet with recycled content backing from Collins and Aikman include **Compaq Computers, Orioles Park at Camden Yards, Hallmark Corporation, Zales Corporation, Computer Associates, Gateway Computers, and The Gap.** **Image Industries** of Armuchee, GA manufactures recycled content carpet using more than 8 million soda bottles daily. Every 125 square yards of Image carpet—the amount needed to carpet a typical 1,500 square foot home—uses about 3,000 plastic bottles.

**Sonoco**, one of the world's largest manufacturers of packaging materials for industrial and consumer markets, aggressively re-collects its own products as a source of raw materials for manufacturing—notably, those zillions of plastic shopping and grocery bags we all have stashed around our homes. An astonishing 60% of the raw material

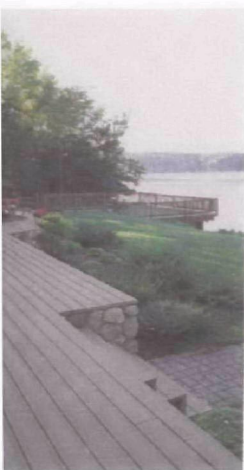
By recycling glass into beautiful dinnerware, Fire & Light creates a market for 1,000 pounds of recycled glass a day.



feedstocks Sonoco uses in making its products are recovered materials. As the largest manufacturer of plastic grocery and shopping bags in the United States, Sonoco was the industry pioneer in introducing recycling systems for this product and supports the recycling efforts of 7,500 grocery stores across the country, which collect as much as a million pounds of bags in a single month.

Okay, that takes care of a lot of the recovered plastics bags, but what about the rest? **Trex Company, LLC** of Winchester, VA uses the recovered plastic grocery bags to manufacture wood-plastic composite lumber. Trex mixes 50% recycled plastic film with 50%

Trex Company of Winchester, VA uses  
recovered plastic grocery bags to  
manufacture wood-plastic composite  
lumber such as the deck shown here.



A deck in Michigan is made from Trex's wood-plastic composite lumber.

waste wood fiber to produce composite lumber for outdoor deck surfaces and landscaping ties. Over 1000 dealers nationwide carry the product, which has been approved for use in residential and commercial structures across North America.

Walls from wheat? The **U.S. Department of Agriculture** has helped to commercialize several building materials containing post-harvest wheat straw, which has traditionally been of little use or value. **Agriboard Industries, Inc.** of Electra, TX manufactures a load bearing wall panel of compressed wheat straw. **Primeboard, Inc.**, of Whapeton, ND, makes a high quality particle board from 100% wheat straw that is used to construct cabinets and other furniture. The board contains no noxious binders and does not off-gas like many wood-based particle boards. **Phoenix Bicomposites** of Mankato, MN, produces Environ<sup>®</sup>, a decorative product used for table and counter tops, flooring, and wall coverings. Environ is made from soybean meal and waste newspaper.

## **COOPERATIVE MARKETING OF RECYCLABLES**

The State of Washington established the **CWC**, formerly the Clean Washington Center, in 1991 to increase the use and value of materials recovered from the waste stream. CWC partners with business, industry, and local governments to expand state-wide recycling infrastructure and offers technical assistance in four areas: business development, technology and engineering, marketing recycled content products or services, and policy research and analysis for businesses and government agencies. CWC's efforts to expand recycling businesses have attracted hundreds of millions of dollars in capital investment to projects in Washington, which generate millions of dollars in state and local annual tax revenue and provide both blue collar and management job opportunities across the state.

The **Central Texas Recycling Association (CTRA)** has made a business of bringing together a number of small sources of recyclables to sell their merchandise more effectively and for better prices. CTRA's program promotes the development of end markets for Texas recyclables and disseminates public education about recycling. CTRA supports rural communities in their recycling efforts by offering assistance in negotiation and administration of market contracts, public education, grant-writing, equipment loans, supplies, labor, volume purchasing, economic development, data collection and record keeping, cooperative marketing system, and statewide and national network opportunities.

During 1997, CTRA sold almost 4,000 tons of material for its members. This translated into saving more than 15 million kilowatt hours of electricity and preventing 110 tons of air pollution and 11,000 cubic yards of waste—enough to divert 550 garbage trucks from landfills. And on top of that, member communities profited from more than \$165,000 in net revenue from sales through CTRA contracts.

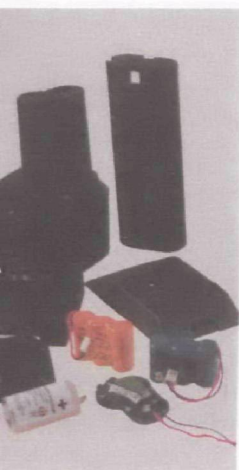
## **PRODUCT STEWARDSHIP FOR RECYCLING**

Demonstrating product responsibility, some manufacturers are taking back their products, once they've become somebody else's waste, and using them as a resource for their manufacturing operations. Manufacturers also are actively putting infrastructure and policies in place to make sure they get these resources back. The **Rechargeable Battery Recycling Corporation (RBRC)**, for example, takes back nickel cadmium (Ni-Cd) rechargeable batteries from more than 25,000 retail collection sites in the



United States and Canada and reclaims the materials for new batteries. The reclaimed nickel is processed into a metal alloy that is used in stainless steel production, while the cadmium is purified and used in the manufacturing of new Ni-Cd batteries. RBRC also provides communities, businesses, and public agencies information to operate Ni-Cd battery collection programs and pays all recycling costs.

Last year, **Armstrong World Industries** of Lancaster, PA, introduced the Ceilings Reclamation Program, a process designed to reduce costs and save landfill space by diverting used ceiling panels from renovation projects to Armstrong plants, where the



The Rechargeable Battery Recycling Corporation collects rechargeable batteries from more than 25,000 retail sites.

Demonstrating product responsibility, some manufacturers are taking back their products, once they've become somebody else's waste, and using them as a resource for their manufacturing operations.

tiles are recycled into new ceiling panels. The first-of-a-kind recycling program was successfully tested during a 1997 renovation project at the **Microsoft** campus in Redmond, WA; 150,000 square feet of mineral fiber ceiling panels weighing 86 tons were re-ground and processed into new ceiling tile. These tiles, which can contain up to 79% recycled content, generated a savings of 52% for Microsoft compared to landfill fees. If landfilled, the cost for disposal would have been more than \$8,000.

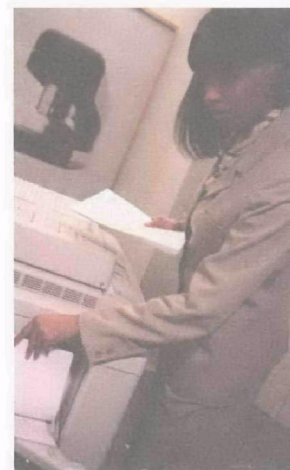
**Xerox** maintains a strong corporate policy on protecting the environment, including a commitment to producing waste-free products in waste-free factories, thereby minimizing the impact Xerox has on the Earth and its limited resources. Xerox believes that designing for the environment not only conserves resources, but reduces costs and pleases customers. Xerox's Document Centre 265 is a "zero landfill" product;

since 98% of the product's parts are recyclable in some way, with 80% of the components being fully remanufacturable. Purchasers of the Document Centre 265 can return replaceable units, at Xerox's cost, and the company will reuse or recycle the parts and components.

Xerox incorporates product recovery into its business operations. New products are designed to be recycled or remanufactured. During the 1990s, Xerox remanufactured equipment and print and copy cartridges and recovered toner cartridges for reuse or recycling. In 1997, Xerox remanufactured equipment from more than 30,000 tons of returned machines, without any loss in quality. Xerox also provides customers with pre-paid return labels so they can ship back their used print and copy cartridges in the packaging from new cartridges. The returned cartridges are then remanufactured to the same quality standards as new ones. In 1997, Xerox's print and copy cartridge return rate reached 65%—the industry benchmark.

Since 1990, **Canon USA** has helped businesses, municipalities, and agencies achieve their waste diversion goals by collecting more than 25 million Canon toner cartridges for recycling and reuse at its Virginia facility. If the cartridges were laid side-by-side, they would cover an area the size of Washington, DC more than three times over. At the same time, Canon achieved an extraordinary 91% monthly recycling average of its manufacturing waste at its Virginia subsidiary, which receives between 20,000 and 30,000 cartridges per day.


**IBM Endicott's Asset Recovery Center (ARC)** has processed about 35 million pounds of old and returned equipment for reusable and recyclable content annually since 1994. Equipment is received and sorted for reuse of parts in field service programs and machines, resale of industry standard parts, and recycling by material content. ARC has increased reuse to 38.2%, while greatly reducing the amount of non-recyclable materials going to landfills—from 13% in 1994 to just 3.5% last year! Additionally, Endicott's Aurora Project, begun last year, is linking industry, local government, and academia in an alliance that is investigating opportunities to reuse and recycle traditional waste materials such as paper, glass, plastic, and industrial byproducts.





# outreach and education

## FOR RECYCLING



A Burbank, CA school teaches children that they can reduce, reuse, and recycle 85% of their lunch waste

It's simply not enough that only those "in the know" understand why we as a nation must recycle and how recycling is helping to secure our children's future. We must make a concerted effort to get the word out about why we are recycling and why we need to do more across all components of recycling. The *National Recycling Challenge* is for everyone, and the only way to get everyone involved is to let them know the importance of their everyday actions. Improved access to facts and news invigorates and enables people to find new and better ways to benefit the environment through recycling. Educational programs on the environmental and economic benefits of recycling can help people understand the reasons recycling contributes to their welfare and the welfare of their children. Increasing awareness translates into more active and effective participants in increasing recycling, purchasing recycled content products, and supporting recycling initiatives.

Awareness is brought about by many efforts and by many groups—from schools and government agencies to non-profit organizations and businesses—involved in promoting the recycling and "buy recycled" message. In fact, many of the businesses and communities mentioned here are members of the U.S. EPA's WasteWise partnership program and/or the National Recycling Coalition's Buy Recycled Business Alliance. Currently, more than 850 companies receive technical assistance and recognition through these programs.

In 1995, at the direction of President Clinton, the **Office of the Federal Environmental Executive** established the White House Closing the Circle Awards Program to encourage Federal agency innovation in implementing waste prevention, recycling, and "green" procurement activities. These



awards not only highlight the Administration's commitment to environmental excellence in government, but also showcase model Federal programs and facilities and encourage further endeavors by the Federal sector, public institutions, and the private sector.

Pennsylvania turned to television to inform citizens about the state's environmental programs. The **Environmental Fund for Pennsylvania**, in conjunction with the state **Department of Environmental Protection**, produces the television series, "GreenWorks for Pennsylvania." The February, 1999, episode shows viewers how to buy recycled content products and features some of the products made by the more than 130 Pennsylvania manufacturers that use recycled materials in their products.

Today's school child learns four R's—Reading, 'Riting, 'Rithmetic, and Recycling! Recently, the Wasteless Lunch pilot program at a **Burbank, CA** school incorporated a sophisticated process that teaches children that they can reuse, recycle and/or compost up to 85% of their lunch waste. When lunchtime is over, the children exit in a reverse cafeteria style, disposing of their lunch waste in the appropriate recycling and composting bins.



### **Are the American people hearing**

the message about the necessity of buying recycled? Since 1997, millions of Americans have celebrated "America Recycles Day" (ARD) on November 15. This national environmental partnership effort is aimed at increasing purchases of recycled products, increasing nationwide media attention, and promoting public support from every sector for recycling and waste reduction. ARD reminds people that setting materials out at the curb is only the first step in recycling. They must also look for and buy products made from materials collected in their recycling programs. Under this program, businesses, industry, government agencies, schools, and civic and environmental groups organize special events, educational campaigns, and incentive programs.

In 1998, 45 states and 2 U.S. territories celebrated with more than 4,000 events across the nation to promote the social and economic benefits of recycling. Vice President Al Gore promoted the event and served as the Honorary Chairman of the campaign.

# recycling is everybody's business



Recycling 27% of our waste now fills enough recycling bins to stretch three-quarters of the way between the earth and the moon.

**W**e hope that this compendium of success stories, drawn from the many, diverse efforts across the country to make recycling work for all of us, will inspire you to join with Vice President Gore in committing to the *National Recycling Challenge*. From waste efficiencies to new innovations in recycling technology, more organizations than ever are making exciting progress in recycling and using recycled materials and recycled content products. If you are recycling at home and in the workplace, your contributions will continue to benefit your community and our country by conserving resources and stimulating our economy—producing real goods and real jobs. But there is more that can and must be done. If you wish to do more, Vice President Gore's *National Recycling Challenge* is your opportunity to step forward and make a difference for our children and the environment.

Join with your neighbors and colleagues by taking the *Challenge*. Visit our web site, [www.ofee.gov](http://www.ofee.gov), where you can learn more about:

- Economic and environmental benefits in *Recycling... for the future: Consider the benefits*.
- Success Stories—get more information about any of the firms, institutions, or government agencies and programs described in this brochure, along with web sites and contacts.
- “America Recycles Day”—with its emphasis on buying recycled.
- The *National Recycling Challenge*—learn more about the *Challenge*, including what other persons have committed to do.

Remember, we are now recycling 27% of the municipal solid waste generated in the United States—more than double the recycling rate 15 years ago. Our national policy is to reach a 35% municipal solid waste recycling rate. Recycling 27% of our waste now fills enough recycling bins to stretch three-quarters of the way between the earth and the moon. Please sign up to do your part to get us the rest of the way there.



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## **How to Take the *National Recycling Challenge***

**America's children need your help to secure the environment for their future.** You can make your commitments by taking the *National Recycling Challenge*. Submit two to three paragraphs to the White House Task Force on Recycling at: "fran.mcpoland@ofee.gov". The first paragraph should include information about your organization's recycling accomplishments. The second and third paragraphs should include your new commitment to the *Challenge*. Please be sure to include, along with your organization's name, a contact name, phone and fax numbers and e-mail address.