
Wisconsin Recycling Means Business

Profiles from Wisconsin's Recycling Economy



Wisconsin Department of Natural Resources
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Wisconsin Recycling Means Business: Profiles from Wisconsin's Recycling Economy

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Design by Sarah Murray

On the cover

First row, from left: Participants in a "waste sort" for Madison Metropolitan School District; compost processing at The Bruce Company of Wisconsin, Inc.; workers install Structural Insulated Panels made by Plymouth Foam Incorporated.

Second row, from left: A worker recycles cardboard at a Veridian Homes building site; a worker shows off plastic sheeting made from recycled plastic by N.E.W. Plastics Corp.; scrap metal is collected for processing by Samuels Recycling Company.

Third row, from left: Workers sort electronics collected by Cascade Asset Management, LLC; foundry sand and pottery cull from Kohler Company are used as structural fill on a building site; workers recycle metal scrap for a project that received help from WasteCap Wisconsin.



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Cynthia G. Moore
Recycling Program Coordinator

Foreword

We all know that waste reduction, reuse and recycling are good for the environment. These actions conserve natural resources, save energy and help limit impacts to global climate by reducing greenhouse gas emissions. Yet as important as these environmental arguments are, they may overshadow an even more important benefit: the critical role of recycling in the economy. Recovered recyclables provide crucial raw materials for a variety of industries in Wisconsin, the United States and the global economy. The value of these materials—in particular steel, plastic and paper—is increasing due to strong demand from developing countries and renewed economic growth at home.

This publication highlights the important role recycling plays in Wisconsin's economy by presenting the stories of a number of businesses around the state. These businesses collect or use recycled materials, find markets for materials that would otherwise end up in the landfill and explore new ways to reduce waste and increase recycling.

These are only some of the many success stories of recycling to be found all over Wisconsin. With the leadership of these and other businesses, underpinned by the inherent economic value of recycled metals, plastics and fiber, our state can continue to improve and expand its recycling efforts, saving valuable resources from landfills and generating jobs in the process. Businesses in Wisconsin rely on recycling to grow Wisconsin's economy. Their successes prove that recyclables are indeed too valuable to waste.



P. Scott Hassett
Secretary, Wisconsin Department of Natural Resources



N.E.W. Plastics Corp. of Luxemburg uses plastic from milk jugs (bottom) and other containers to manufacture plastic sheeting for truck liners (top) and plastic lumber. (Top photo by Robert Queen; bottom photo by Karin Olefsky.)

Wisconsin: a recycling leader

Wisconsin is nationally recognized for its recycling program. Well over 90% of Wisconsin residents support recycling and participate in recycling programs. We divert over 40% of our waste materials from landfills through recycling, reuse, waste reduction and composting, and recover more than 50% of the newspaper, cardboard, bottles and cans recycled every day at Wisconsin homes and businesses.

With such a strong foundation, it would be easy to be satisfied with maintaining the status quo. However, accepting the status quo is not what has made Wisconsin a leader. Despite our relatively high recycling rate, we continue to landfill many highly recyclable materials at a net loss to our economy. Recyclable resources, once landfilled, are lost to commerce forever. The greatest opportunities for increased resource recovery in Wisconsin are in residential and business paper, used electronics, construction and demolition debris, and food and other organic materials.

Not all of the recycled materials generated in Wisconsin are actually used here. But all these materials are traded every day on national and global commodity markets, and there is strong competition for recovered materials among the global markets.

The number and range of American industries that rely on recycled resources for their production continues to grow—but there is a very real concern that without enough recovered materials, some American plastics and paper mills and metal producers might have to close their doors. As the box on this page shows, recycling and reuse can drive significant job creation—sometimes dozens of jobs for every 10,000 tons of material recycled or reused in a year. By contrast, landfilling the same amount of material creates only one job.

The changing recycling industry

During the past several years, Wisconsin has enjoyed strong markets and robust demand for most recycled materials. Wisconsin paper mills use various grades of recycled paper generated throughout the

Number of jobs created each year per ton of material recycled/reused

Product reuse

Computer reuse:	296
Textile reclamation:	85
Wooden pallet repair:	28

Recycling-based manufacturers

Paper mills:	18
Glass product manufacturers:	26
Plastic product manufacturers:	93
Composting:	4

Source: Institute for Local Self-Reliance, Washington, D.C., 1997. Figures based on interviews with select facilities around the country.

Midwest as feedstock to create tissue or boxboard. Metal processors continue to aggressively collect and process material throughout the state. That material may end up being manufactured into new Harley-Davidson engines or steel structural components for such projects as the new Madison Overture Center for the Arts.

While early state recycling efforts in the 1990s focused on increasing markets for materials banned from the landfill—such as paper, aluminum cans and plastic bottles—lately we have seen a dramatic increase in demand for new recycled materials, driven by the needs of both domestic and offshore manufacturers. There are expanding markets for batteries; fluorescent light bulbs; electronic equipment such as televisions, computers and cell phones; industrial byproducts; and construction and demolition debris. These new markets justify the commitment Wisconsin businesses have made to preventing discarded materials from being wasted in landfills.

The businesses highlighted in this publication are committed to strong recycling and reuse principles. Their commitment makes environmental sense and it makes sense for Wisconsin's economy. ■

Recovering the “waste stream”

The amount of waste disposed of in Wisconsin landfills has continued to increase, reaching more than 11 million tons in 2005, up from about 9 million tons in 1995.

In using the term “waste,” however, it is easy to forget that the vast majority of what is disposed of is highly usable material. An office memo, a plastic bottle, a cardboard box, a wooden pallet, an old computer—these are all commodities desired by the growing Wisconsin recycling industry. These resources only become “waste” when we make the mistake of putting them in a garbage can.

What are the major recoverable materials in the disposal stream? Below is a sampling of “wastes” that Wisconsin recyclers can easily turn into usable raw materials and products:

Aluminum: Aluminum cans are one of the most valuable of all recyclables because of the large amounts of energy needed to produce new aluminum. Although aluminum is only a small fraction of landfilled material, the more than 16,000 tons of cans and 15,000 tons of other aluminum that end up in Wisconsin landfills each year represent a significant economic loss (see box).

Electronics: Computers, computer equipment, cell phones, TVs and other electronics represent a growing disposal challenge, especially since many of these products have hazardous components such as lead and mercury. In 2006, it is predicted that 101,000 tons of electronics will be discarded in Wisconsin alone.

Ferrous metals: Iron-based metals are used in a va-

2005 value of recyclables landfilled in Wisconsin

Aluminum cans:	\$21 million
Aluminum (other):	\$15 million
Cardboard:	\$17 million
Ferrous metals (incl. cans):	\$9 million
Newspapers & magazines:	\$13 million
Office & mixed paper:	\$19 million
Plastic containers:	\$19 million
Total:	\$113 million

Sources: 2002 DNR Waste Composition Study (tonnages); Recycler's World (8/2005, prices)

riety of products, including appliances, cars, building materials and many metal cans. More than 170,000 tons of ferrous metals enter Wisconsin landfills each year, accounting for about 4% of all landfilled materials.

Glass: The use of recycled glass, or cullet, to make new bottles and jars saves glass manufacturers a large amount of energy and improves their profitability. More than 40,000 tons of glass end up in Wisconsin landfills each year, representing about 1% of all landfilled materials.



Organics (food and yard waste): Food waste may include not only spoiled food and food scraps, but edible food thrown out by restaurants and others. Yard

Continued on next page

In 2004, two-thirds of beverage containers were not recycled in the United States. If they had been, the energy saved could have supplied power for more than 2 million homes for one year.

Source: Waste Management World, September-October 2005

Continued from previous page

waste, which includes leaves, branches and other materials less than 6 inches in diameter, is banned from Wisconsin landfills. Nearly 490,000 tons of food waste and another 60,000 tons of yard waste (almost all larger than 6 inches in diameter) end up in Wisconsin landfills each year, representing more than 10% of all landfilled materials.



Paper: Newspaper, office paper, cardboard and magazines are just some of the paper “grades” in growing demand from foreign and domestic paper mills, including a number of large mills in Wisconsin. Nearly 1 million tons of paper and cardboard end up in Wisconsin landfills each

year, representing more than 20% of the total landfilled materials.

Plastic bottles: Domestic and export markets have a growing appetite for recyclable plastic resins, especially given high oil prices. Nearly 500,000 tons of plastics go into Wisconsin landfills each year, or more than 10% of all landfilled materials. While not all of this is currently recyclable, nearly 40,000 tons of plastic containers representing significant economic value (see box) are among Wisconsin’s landfilled materials each year.

Wood (untreated): This is the largest single waste

Recycling rates for materials banned from Wisconsin landfills

Aluminum containers:	55%
Corrugated cardboard:	72%
Glass containers:	57–74%
Magazines:	31–35%
Newspapers:	67%
Office paper:	28–57%
Plastic containers (#1 & #2):	41–51%
Steel containers:	54%
Tires	>95%
Yard waste	78%

Source: DNR Status of Recycling Report 2003

category found in Wisconsin landfills, representing nearly 13% of all landfilled materials. Nearly 610,000 tons of untreated wood, much of which could be reused or composted, end up in Wisconsin landfills each year, much of it from construction, remodeling and demolition projects. In total, construction and demolition debris—much of which could be recycled or reused—represents nearly 30% of all materials going into Wisconsin landfills each year.

There is work to do to recover more of these valuable materials, but the Wisconsin recycling economy is up to the challenge. The companies and organizations featured in this publication represent the thousands of Wisconsin businesses that incorporate recycling, reuse and waste reduction into their business every working day. ■

Internet recycling resources

Wisconsin Department of Natural Resources Recycling Program

<http://dnr.wi.gov/org/aw/wm/recycle/index.html>

Associated Recyclers of Wisconsin

<http://www.arow-online.org/>

National Recycling Coalition

<http://www.nrc-recycle.org/>

U.S. Environmental Protection Agency recycling homepage

<http://www.epa.gov/garbage/recycle.htm>

University of Wisconsin-Extension Solid and Hazardous Waste Education Center

<http://www3.uwm.edu/Dept/shwec/>

WasteCap Wisconsin

<http://www.wastecapwi.org>

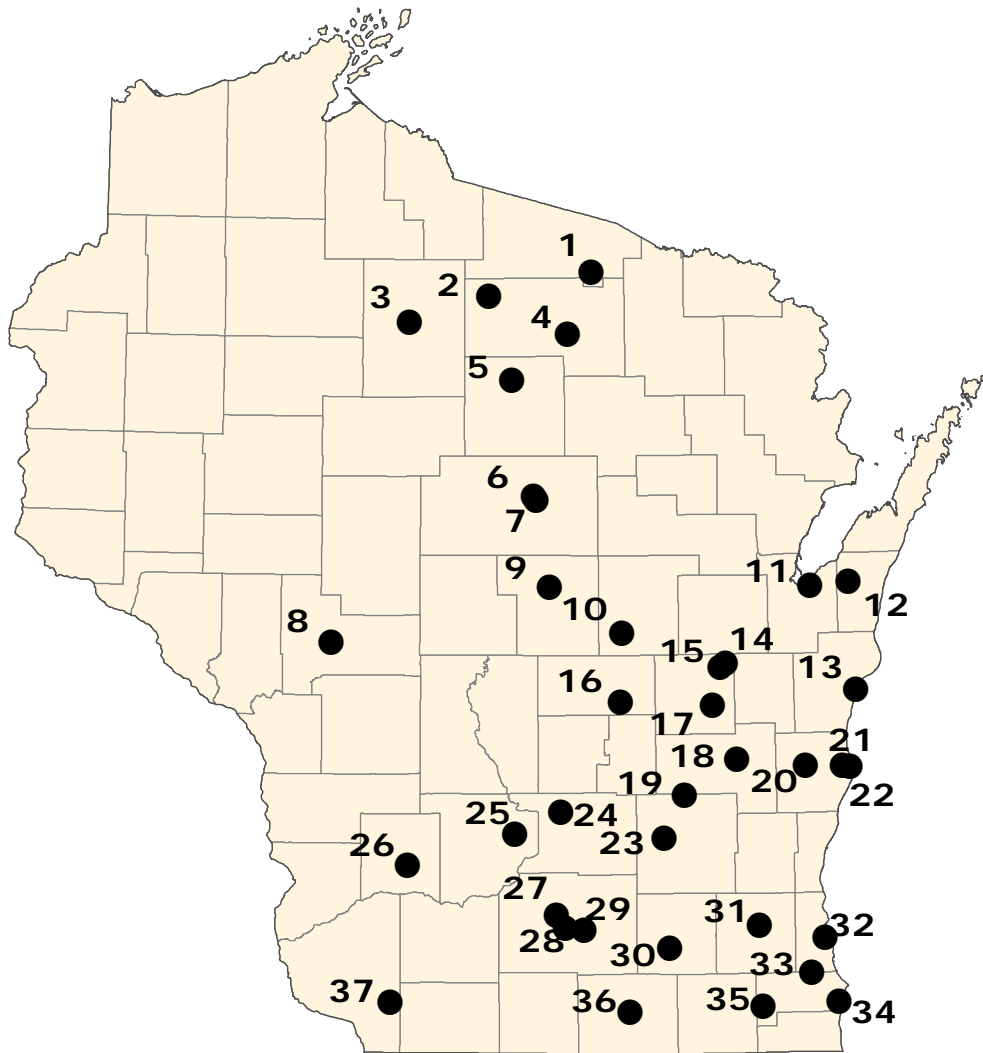
Wisconsin Be SMART Coalition

<http://www.besmart.org>

Glossary of terms

Anaerobic digestion	The decomposition of organic matter (such as food waste) without the presence of oxygen; one byproduct of the process is methane, which can then be converted to heat or electrical energy
Asset management	Processes for maintaining the security of information on computers and other electronic equipment when recycled
Beneficial use/reuse	Secondary use for materials that might otherwise be taken to a land-fill (for example, using grain from beer brewing in animal feed)
Composting	The decomposition of organic matter (such as yard waste and paper fibers) in the presence of oxygen to form material that can be used as a soil amendment; byproducts are carbon dioxide and water
Construction and demolition (C&D) debris	Waste generated during the construction, remodeling, repair or demolition of buildings or other structures, including concrete, drywall, lumber, window glass, and plumbing pipes and fixtures
Feedstock	A raw material, such as plastic resin or paper fibers, used to manufacture a product such as plastic lumber or cardboard
Manufacturing byproduct	Material that is created and/or left over from a manufacturing process. One example is the sludge resulting from paper production
Materials recovery facility (MRF)	A facility where recyclable materials are sorted and processed (or sent to processors) for reuse or conversion to commodities
Recovered material	Material diverted from the municipal solid waste stream for the purpose of recycling, reuse or composting
Recyclables	Materials recovered from the solid waste stream and transported to a processor or end user for recycling
Recycled fiber	Recycled office paper, newspaper, cardboard and similar materials that are broken down into pulp and remanufactured into paper products
Residuals	Contamination of recyclable materials that remain after processing, composting, recycling, etc.; usually disposed of in landfill
Sludge	The semiliquid residue remaining from the treatment of industrial water (e.g., from paper mills) and wastewater or municipal wastewater

Recycling business locations



Map legend

- | | |
|--|--|
| 1 Trig's Foods, Eagle River | 23 Samuels Recycling Company, Beaver Dam |
| 2 Trig's Foods, Minocqua | 24 Goodwill Industries of South Central Wisconsin and Samuels Recycling Company, Portage |
| 3 Georgia-Pacific, Phillips | 25 Humane Manufacturing Company, Baraboo |
| 4 Printpack Inc. and Trig's Foods, Rhinelander | 26 CBT Wear Parts, Inc., and Goodwill Industries of South Central Wisconsin, Richland Center |
| 5 Packaging Corporation of America, Tomahawk | 27 The Bruce Company of Wisconsin, Inc., Middleton |
| 6 Georgia-Pacific, Trig's Foods and Wausau Tile, Wausau | 28 Goodwill Industries of South Central Wisconsin; Habitat for Humanity of Dane County ReStore; Madison Metropolitan School District; Sadoff & Rudoy Industries, LLP; Samuels Recycling Company; Veridian Homes; and WasteCap Wisconsin, Madison |
| 7 Sadoff & Rudoy Industries, LLP, Schofield | 29 Goodwill Industries of South Central Wisconsin, Monona |
| 8 Badger State Industries, Black River Falls | 30 Goodwill Industries of South Central Wisconsin, Fort Atkinson |
| 9 Trig's Foods, Stevens Point | 31 Wisconsin Be SMART Coalition, Waukesha (and southeastern Wisconsin) |
| 10 Samuels Recycling Company, Waupaca | 32 Miller Brewing Company, WasteCap Wisconsin and Wisconsin Paperboard Corp., Milwaukee |
| 11 Georgia-Pacific; Sadoff & Rudoy Industries, LLP; and Samuels Recycling Company, Green Bay | 33 Sadoff & Rudoy Industries, LLP, Franklin |
| 12 N.E.W. Plastics Corp., Luxemburg | 34 Badger State Industries, Racine |
| 13 Sadoff & Rudoy Industries, LLP, Manitowoc | 35 Saint-Gobain Containers, Burlington |
| 14 SCA Tissue, Menasha | 36 CRT Processing Corporation and Humane Manufacturing Company LLC, Janesville |
| 15 Georgia-Pacific, Minergy Corp. and SCA Tissue, Neenah | 37 Faherty Inc., Platteville |
| 16 Badger State Industries, Redgranite | |
| 17 Georgia-Pacific, Oshkosh | |
| 18 Badger State Industries and Sadoff & Rudoy Industries, LLP, Fond du Lac | |
| 19 Samuels Recycling Company, Waupun | |
| 20 Plymouth Foam Incorporated, Plymouth | |
| 21 Kohler Company, Kohler | |
| 22 Georgia-Pacific and Sadoff & Rudoy Industries, LLP, Sheboygan | |

Summary of profiles

Company profiles

The Bruce Company of Wisconsin, Inc.	Composts yard waste from surrounding communities and construction wood scrap; uses finished compost in application of new lawns
Cascade Asset Management, LLC	Demanufactures old electronics equipment (including computers) for recycling or refurbishes it for reuse
CBT Wear Parts	Manufactures replacement parts for recycling machinery; is pilot-testing equipment for large-scale digesting of food waste
CRT Processing Corporation	Recycles computer monitors and peripherals, TVs and other electronics; converts used cathode ray tubes into feedstock for new glass
Faherty Inc.	Family-owned recycling and solid waste provider in southwestern Wisconsin; operates materials recovery facility (MRF)
Georgia-Pacific	Uses recycled fiber to make household paper and tissue products; Green Bay mill is world's largest tissue recycling & production facility
Goodwill Industries of South Central Wisconsin	Collects and sells reusable household goods, including textiles, books and housewares, to fund its charitable activities
Habitat for Humanity of Dane County ReStore	Accepts usable construction and demolition waste or surplus supplies for resale to raise money for Habitat for Humanity
Humane Manufacturing Company LLC	Recycles tires into rubber mats for fitness, industrial and animal applications, such as mats for weight rooms and animal stalls
Kohler Company	Has found uses for manufacturing byproducts such as foundry sand; also recycles pottery scrap, scrap metal, paper and cardboard
Miller Brewing Company	Has found beneficial reuses for brewer's grain and yeast; has reduced amount of glass, aluminum and plastic in beer packaging
Minergy Corp.	Produces energy and glass aggregate (used in a number of products) from paper mill sludge and municipal sludge
N.E.W. Plastics Corp.	Produces plastic lumber for decks, fencing and other uses from recycled HDPE plastic (such as milk jugs)

Summary of profiles cont'd

Packaging Corporation of America	Uses recycled fiber in cardboard products; Tomahawk plant has found uses for concrete, boiler ash and cinders, and biogas
Plymouth Foam Incorporated	Produces foam packaging, product components and building materials using recycled expanded polystyrene (EPS) foam
Printpack Inc.	Recycles plastic film used to make candy bar wrappers and other packaging
Sadoff & Rudoy Industries, LLP	Purchases scrap metals, including aluminum, brass, iron and steel, and processes them for reuse
Saint-Gobain Containers	Manufactures bottles for customers like Anheuser-Busch using 15-20% recycled glass
Samuels Recycling Company	Recycles scrap metals such as iron, steel, aluminum, brass and zinc from autos, foundries and other sources
SCA Tissue	Uses 100% recycled paper fiber to produce paper towels, napkins, tissues and other products for the away-from-home market
Veridian Homes	Recycles wood and vinyl scrap, cardboard, concrete and other materials from new home construction
Wausau Tile	Uses 100% recycled glass in several products, including floor tiles, outdoor tables and chairs, planters and waste receptacles
Wisconsin Paperboard Corp.	Uses recycled fiber to produce paperboard for packaging (such as cereal boxes), cardboard tubing and other uses

“Overall, [recycling] is a social responsibility. ... If done right, it’s economically feasible for the operation, too.”

—Scott Busch, Cargill

Summary of profiles cont'd

Resources and other success stories

Badger State Industries	Trained inmates refurbish and recycle computer equipment, wheelchairs and handicapped shower equipment; pilot-testing use of biodiesel in delivery trucks
Madison Metropolitan School District	Conducted a waste sort to analyze success of school recycling efforts; working to increase recycling and reduce landfill costs
Trig's Foods	Operates a recycling center in Minocqua; emphasizes recycling at its many store locations in northcentral Wisconsin
WasteCap Wisconsin	Helps businesses reduce construction and demolition waste and increase recycling rates; also works on food waste and electronic recycling
Wisconsin Be SMART Coalition	Partnership of local communities, state agencies, nonprofits and businesses that promotes waste reduction, conservation, pollution prevention and sustainability



Workers at Cascade Asset Management's Madison facility sort electronic components for recycling. Cascade's 65 employees process computers, cell phones, stereos and other electronic equipment. Some is demanufactured and recycled, while other equipment is refurbished for reuse.

“Since 2003, there’s been a 200% to 300% increase in value for our recyclable commodities such as circuit boards with precious metals, steel, copper wire and engineered plastics.”

**—Neil Peters-Michaud,
Cascade Asset Management, LLC**

Company profiles



Photos from previous page

A Bruce Company blower truck, used to apply grass seed, compost and fertilizer for new lawns. The Bruce Company composts municipal yard waste and construction wood scrap.
Photo courtesy Bruce Company.

The Habitat for Humanity of Dane County ReStore in Madison sells donated building supplies at a reduced cost and uses the proceeds to help fund Habitat for Humanity projects. Photo by Sarah Murray.

The corporate headquarters of Plymouth Foam Incorporated in Plymouth, WI. Plymouth Foam uses recycled expanded polystyrene (EPS) foam in many of its products.
Photo courtesy Plymouth Foam.

Printpack Inc. in Rhinelander manufactures "flexible packaging," such as wrappers for candy bars and ice cream treats. It recycles scrap plastic film from its manufacturing process.
Photo courtesy Printpack Inc.

Faherty Inc. is a family-run recycling and solid waste service provider in southwestern Wisconsin, bringing recyclables collected curbside to its Platteville processing facility.
Photo courtesy Faherty Inc.

Georgia-Pacific's Broadway paper mill in Green Bay, the world's largest tissue recycling and production facility and has more than 1,700 employees.
Photo courtesy Georgia-Pacific.

The Bruce Company of Wisconsin, Inc.

Middleton, WI



Yard waste and wood scrap helping new lawns grow? That's what The Bruce Company decided to make happen.

The Madison-area landscaping firm is taking branches, grass clippings and other yard waste from nine southcentral Wisconsin communities and turning them into new lawns that grow faster and require fewer chemical treatments than typical turf.

Municipalities pay the company to receive the yard waste they collect at one of its three composting sites in the Madison area, each with a 15,000–20,000 cubic yard capacity. The program started in 2003, after one of the municipalities approached Bruce Company about handling the yard waste it was collecting.

“There’s quite a bit more to [composting] than heaping leaves in a pile and letting them rot,” Altwies said.

It takes anywhere from four to eight months to produce a batch of compost from the materials, depending on the season, according to James Altwies, the company’s environmental initiatives coordinator. The finished product is primarily used in the company’s landscaping business, though some is also sold to contractors or through its Middleton retail store.

In its landscaping business, Bruce Company mixes the compost with grass seed, fertilizer and a stabilizing



A batch of The Bruce Company’s Red B Elite Compost is screened for a second time. The compost is used as a potting medium and topdressing for grass. Photo courtesy Bruce Co.

polymer and applies it to a lawn site with a blower truck. Using this method allows turfgrass to grow 60–70% faster than a traditional lawn, according to Altwies. He estimated that the firm had created approximately 1,000 lawns this way over the first two years of the program.

Altwies said the landscaping firm emphasizes quality control in its composting process, including ensuring a proper balance of source materials, which is important for achieving a good chemical and nutrient balance in the finished product. “There’s quite a bit more to it than heaping leaves in a pile and letting them rot,” he said, noting that one of the company’s challenges is educating the public about the composting process.

In addition to the municipal yard waste, the company accepts wood scrap from construction projects at no cost, taking in about 1,000 cubic yards of the wood per week. “It seems like we can never get enough of that kind of stuff,” Altwies said.

Altwies said two of Bruce Company’s three composting facilities are currently running close to capacity, and the company hopes to expand its efforts in the future. “We’re definitely looking to grow this program,” he said. ■

Quick facts: The Bruce Company

Recycled materials used: yard waste, construction wood scrap

Recycling start date: 2003

Number of employees: 600+ overall; 10-14 seasonally working with compost

Contact: James Altwies, 608.836.7041 ext. 344, jaltwies@bruceco.com

Web site: www.bruceco.com



Cascade Asset Management, LLC

Madison, WI

There's a gold mine of commodities buried beneath the circuits and switches of old computers and other electronic equipment. Literally. That's where Cascade Asset Management, LLC comes in.

Cascade is an electronics asset management and recycling company that demanufactures or breaks down old electronic equipment to extract its valuable parts for resale. The company also refurbishes some of the old computers for resale.

Quick facts: Cascade

Recycled materials collected: computers and other electronics equipment

Recycling start date: 1999

Number of employees: 65

Contact: 1.888.222.8399 or 608.222.4800,
info@cascade-assets.com

Web site: www.cascade-assets.com

“Since 2003, there’s been a 200% to 300% increase in value for our recyclable commodities,” Peters-Michaud said.

“Our motto is, ‘We cascade IT equipment to the next best use,’” said Cascade CEO Neil Peters-Michaud.

“Since 2003, there’s been a 200% to 300% increase in value for our recyclable commodities such as circuit boards with precious metals, steel, copper wire and engineered plastics,” Peters-Michaud said. The materials go to local processing companies and to smelters as far away as Europe.

“There’s a very, very strong market for our mate-

rials,” Peters-Michaud said. “There’s a lot of competition to buy. We added a third shift in May to handle all the growth and demand.”

One-third of Cascade’s equipment is refurbished for re-sale, Peters-Michaud said, and ends up with wholesale and individual customers all over the world. Cascade has an online store to help market the equipment.

Cascade guarantees its customers data security by destroying old data stored on computer hard drives with its in-house shredder and electronic wiping system. After processing, it issues a Certificate of Destruction.

Cascade has been collecting, processing and refurbishing old computer equipment—plus other electronics such as stereos, cell phones and electronic medical testing equipment—since April 1999. It currently employs 65 people, and gathers old electronics from sources all over the United States and even Toronto.

“Over 75% of our volume comes from the health care industry (hospitals in Wisconsin and across the U.S.), financial and insurance institutions (banks) and large Fortune 500 corporate headquarters,” Peters-Michaud said.

Peters-Michaud emphasized that the electronics recycling industry is a strong and growing sector that provides lots of jobs. “The three areas of job growth—recyclers, distributors and manufacturers—create a good tax base for the state of Wisconsin,” he said. “This industry is also great for the environment.” ■



Computer inventory at Cascade’s Madison facility. Photo courtesy Cascade Asset Management.

CBT Wear Parts, Inc.

Richland Center, WI



Could waste from food processing plants be an alternative energy source? One Wisconsin company is trying to find out.

CBT Wear Parts is one of just a handful of companies in the United States making replacement parts for recycling machinery such as plastic shredders and glass crushers. It got its start in the late 1980s manufacturing parts for yard waste composting machinery. Over the years, it has worked to improve the durability of the parts using special coatings and alloys.

Now, according to president Mark Heffernan, the company is branching out with a vision of the future in which renewable energy technologies can be paired up to reduce waste and produce energy. "We think that by partnering these technologies in the world of renewable energy, they can help each other," Heffernan said.

Digesting waste could generate 2–10% of a food processing plant's energy needs.

The company's latest initiative has been to develop a High Solids 2-Phase Anaerobic Digester that has the potential to digest food waste on a large scale while generating renewable energy in a cost-effective manner.

Like composting, digestion is a process that decomposes organic matter. Unlike composting, it does this without oxygen and produces methane, which can be converted to heat or electrical energy, as a byproduct.

Heffernan said one of the major challenges in digesting food waste is its high percentage of solid content compared with other digestible materials. Currently, food waste must be diluted with large amounts of water, leading to high costs for composting on a large scale.

CBT is preparing to pilot-test the digester in Milwaukee with Growing Power, a nonprofit that operates a greenhouse as an urban agriculture demonstration. The digester will process 2 to 5 tons of food waste per day. Methane from the process will help heat the



CBT president Mark Heffernan with the High Solids 2-Phase Anaerobic Digester at Growing Power's greenhouse in Milwaukee, where it will be pilot-tested. Photo courtesy CBT Wear Parts.

greenhouse, and the nutrient-laden water the digester produces will help fertilize the greenhouse plants.

If CBT's process works, Heffernan said, food processing plants and other facilities with high volumes of food waste could digest the material on-site and generate renewable energy in the form of methane, a byproduct of the digestion process. He estimated a food processing plant could generate 2 to 10% of its energy needs this way.

While success is not guaranteed, Heffernan is already looking toward future applications, such as pairing the digester with ethanol production plants to digest their leftover corn byproducts. "There are a lot of places to go with this," he said. ■

Quick facts: CBT Wear Parts, Inc.

Recycling products manufactured:

replacement parts for glass-crushing, plastic-shredding, asphalt/concrete-crushing and composting machinery

Recycling manufacturing start date: 1988

Number of employees: 16

Contact: Mark Heffernan, 608.538.3290



CRT Processing Corporation

Janesville, WI

Business is good, according to Jim Cornwell, director of CRT Processing Corporation. "Since starting this business in February 2004, we've grown to 89 employees processing 1.5 million pounds of electronic equipment per month. We're trying to hold on and steer the course of this business!" he said.

CRT is a recycling company that processes electronic equipment, such as computer monitors and other peripherals, TVs, photocopiers, cell phones and more.

"We receive electronic equipment from all over the U.S.," Cornwell said. "About 50% of our equipment comes from other recycling companies needing further processing, and 50% from corporations and institutions."

CRT's 89 employees process 1.5 million pounds of electronics each month.

Some equipment is repaired and refurbished. Outdated equipment is demanufactured. Electronic components are separated into glass, metals and plastics. In particular, cathode ray tubes (CRTs) are converted into reusable cullet—the raw material for glass—and sold to glass manufacturers around the world.

Cornwell said 93% of what the company receives is end-of-life equipment that is processed to recover individual components. Customers for its various separated components include Samuels Recycling Company (for



Workers process electronics received at the CRT Processing facility in Janesville. Photo courtesy CRT Processing Corporation.

metal recycling), and Asahi Corporation and L.G. Phillips Displays (for glass recycling). In addition, it sells to several plastic recyclers around the country who re-melt and re-grind the plastics or blend them with other raw materials.

CRT Processing also provides asset management for hard drives. Cornwell described the three major options for data security as:

1. An electronic data wipe of information from hard drives using specialized software following U.S. Department of Defense standards.
2. A Degaussing system, which uses powerful magnets to destroy the hard drive and its data..
3. A shredder system, which shreds the hard drive into 1/2-inch pieces.

The company's biggest challenge, according to Cornwell, comes from businesses and brokers who send obsolete electronic equipment overseas, where the rules of recycling, data protection and proper waste management do not apply. "We're trying to educate the public on the hazardous materials contained in electronic equipment and the dangers posed if it is improperly disposed of," Cornwell cautioned. "When businesses send their equipment overseas, they lose all control over their business data and how the waste is managed." ■

Quick facts: CRT Processing

Recycled materials used: computer monitors and other peripherals, TVs, cell phones, other electronics

Recycling start date: 2004

Number of employees: 89

Contact: James "Jim" Cornwell, 608.754.3400

Web site: www.crtprocessing.com

Faherty Inc.

Platteville, WI



As a family-owned recycling and solid waste service provider in largely rural southwestern Wisconsin, Faherty Inc. relies on its relationships with individual customers. “We’re still pretty much a ‘handshake’ company,” said vice president Ed Faherty. “We’re able to know most of our customers.”

Based in Platteville, the business operates a materials recovery facility (MRF) and solid waste transfer station and provides waste and recycling pickup services to several municipalities and businesses in the surrounding counties. The company has 10 employees in its recycling department, and recycling and waste reduction accounts for roughly 40% of its business.

Since the landfill it uses is a 230-mile round trip away in the Quad Cities, Faherty said it makes business sense to divert all he can from the landfill. The company deals both directly with end users of recycled products and with brokers to market cardboard, paper, plastic, metals, glass, electronics, tires and other materials.

“I don’t really ever have a problem finding a home for materials we collect,” Faherty said. He said markets have been improving for some materials, such as

Quick facts: Faherty Inc.

Recycled materials collected: paper, cardboard, plastics, metal cans, electronics, fluorescent bulbs, scrap metals, tires, appliances, pallets

Recycling start date: 1990

Number of employees: 10 in recycling dept.

Contact: Ed Faherty, 800.848.4591 (phone), 608.348.6155 (fax), edfaherty@yousq.net

plastics, and that the fact that his company still collects source-separated material (rather than the “throw-it-all-in” collection method (known as single-stream collection increasingly used by larger haulers) helps in some markets because there is less contamination.

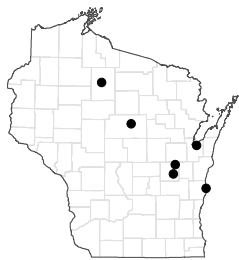
“I don’t really have a problem finding a home for the materials we collect,” Faherty said.

Faherty Inc. also works with its customers to find markets for more specialized materials, such as plastic bags used for packaging by the Lands’ End distribution center in Dodgeville. It will soon have a staff member accredited by WasteCap Wisconsin in construction and demolition (C&D) waste management and recycling.

As of March 2006, Faherty said the company was serving 24 municipalities and 800 commercial clients. While the company is only handling about half the material it could in its facility, he said Faherty Inc. is aiming for “controlled growth.” Faherty noted that the company does not have an active sales staff in most of the area it serves and does not try to undercut competitors in price. “We want people to select us on reputation and establish a relationship based not on price but on service,” he said. ■



Trucks bring materials collected from curbside recycling to be sorted and processed at Faherty Inc.’s Platteville facility. Photo courtesy Faherty Inc.



Georgia-Pacific

Green Bay, WI

Georgia-Pacific (GP) offers a number of products that contain recycled fiber or are made from 100% recycled fiber “We’ve been able to turn our recycled paper stream into higher quality consumer products—like softer, stronger, whiter toilet paper for instance,” said Ken Graves, the company’s quality assurance manager, and Mike Moore, environmental engineer.



GP is a leading manufacturer of several well known paper products, such as Mardi Gras napkins, Soft ‘n Gentle toilet tissue and So-Dri paper towels. A majority of its Green Bay operations’ products are made with recycled fibers from waste paper. Its Broadway paper mill in Green Bay, which employs more than 1,700 people, is the world’s largest tissue recycling and production operation, with 700,000 tons of waste paper processed per year.

Georgia-Pacific’s Broadway mill in Green Bay is the world’s largest tissue recycling and production operation.

Graves and Moore said the company’s products are available in a number of retail venues, ranging from grocery stores to warehouse clubs to mass retailers. The company also supplies tissue products for hotels, restaurants, stadiums and other public areas. Graves and Moore said the company also has a presence in Europe, Mexico and Canada.

GP has one of the largest paper processing/recycling plants in the United States, the Ecosource facility. Ecosource employs more than 70 workers

Quick facts: Georgia-Pacific

Recycled materials used: recovered paper fiber, plastic packaging wrap

Recycling start date: 1930s

Number of employees: More than 1,800 at Broadway and Ecosource facilities

Contact: Mary Jo Malach, 920.438.2949, MaryJo.Malach@GAPAC.com

Web site: www.gpgreenbay.com

who sort and process 100,000 tons of commercial grades of waste paper per year for many paper mills throughout Wisconsin and the world.

The source for most of the mills’ raw materials is pre- and post-consumer waste paper collected from recycling efforts in local counties, municipalities, businesses, etc. Pre-consumer paper comes from printed books, magazines and papers that never made it to the marketplace.

GP began using wastepaper to make products back in the 1930s. Graves and Moore said getting enough of the waste paper material is a challenge. “We could use more,” they said.

In addition to paper products, GP has also been successful at recycling the

poly-wrap and stretch-wrap used to package its paper products, which may become slightly damaged in the packaging process. “We’ve found there’s a good market for this,” Graves and Moore said. ■



Goodwill Industries of South Central Wisconsin

Madison, WI (headquarters)



For Goodwill Industries of South Central Wisconsin, recycling is a means to achieving its larger goal of helping people with disabilities and other special needs find housing and employment and be fully integrated into their communities.

“We wouldn’t exist if it wasn’t for our mission,” said director of operations Sue Ann Kraus.

To accomplish this mission, Goodwill provides housing and employment for disabled individuals, often in conjunction with local, state and federal governments. To help fund these programs, it operates six retail stores in its 14-county region. The stores generate about \$6 million in annual sales.

Annual sales of \$6 million from recycled goods help Goodwill fund its mission.

Each of the six stores (located in Madison, Monona, Portage, Richland Center and Fort Atkinson) has a donation center associated with it, accepting textiles, electronics, housewares and other “hard goods,” such as books and furniture. In 2005, the South Central Wisconsin organization collected approximately 24 million pounds of donated goods, including 12 million pounds of textiles.

Quick facts: Goodwill Industries

Recycled materials collected: textiles, books, furniture, housewares, electronics, other household items

Recycling start date: 1971

Number of employees: 300+

Contact: Sue Ann Kraus, 608.246.3140, skraus@goodwillscwi.org

Web site: www.goodwillscwi.org



Textiles donated to Goodwill await sorting at its central processing facility in Madison. Photo courtesy Goodwill Industries of South Central Wisconsin.

Most of the donations are sent to a 20,000-square-foot central processing facility in Madison, where some of Goodwill’s 300 employees sort and prepare them for distribution among the retail stores. Employees keep an eye out for “exceptional items” to put on shopgoodwill.com, an eBay-style auction site launched in 2003 that allows Goodwill to generate more revenue for some items. Unusable or unsold items are recycled or sent to other Goodwill branches whenever possible.

Kraus said the organization has the capacity to receive more donations and is always trying to increase its donor base, though it has to compete with a number of other organizations (including for-profit businesses) to receive the same items. Goodwill partners with businesses such as Boston Store for donation drives and receives surplus or return items from a variety of local retailers.

“Our greatest challenge is to continue to build our donations while remaining responsible stewards of these resources,” Kraus said. “Only in doing so will we be better able to serve more people in our local community.” ■



Habitat for Humanity of Dane County ReStore

Madison, WI

During her 14 years as a carpenter, Jen Voichick saw a lot of building materials go to waste. When an injury forced her to retire from remodeling work, she wondered if she could do something to make use of surplus materials. Her idea was a place where homeowners, suppliers and contractors could donate flooring, lumber and other usable materials, and builders and remodelers could shop for cheap supplies.

When Voichick approached Habitat for Humanity of Dane County, she discovered she wasn't the first one with such an idea. Habitat "ReStores" were popping up around the country. Using a manual from the Austin, Texas, ReStore and a grant from the DNR, Voichick launched the Habitat for Humanity of Dane County ReStore in September 2001.

Since then, the ReStore has kept nearly 3,000 tons of usable building materials out of the landfill and has seen annual sales increase from \$340,000 to nearly \$600,000. Through fall 2005, the ReStore had raised enough money to build 12 Habitat homes.

Voichick said about half of the materials the store receives are surplus donated by contractors and

Quick facts: Habitat ReStore

Recycled materials collected: construction & demolition waste/surplus, including cabinets, doors, flooring, hardware, lighting fixtures, lumber, plumbing, windows

Recycling start date: 2001

Number of employees: 6

Contact: Jen Voichick, 608.661.2813

Web site: www.restoredane.org

suppliers and about half are from remodeling and deconstruction projects. The ReStore offers assistance with deconstruction for a nominal fee, and also offers a pick-up service for large donations.

Since 2001, the ReStore has sold \$1.5 million of materials that would have ended up in the landfill.

The ReStore accepts a wide range of building supplies, including flooring, cabinets, light fixtures, lumber, hardware and insulated windows. Most are sold at 50-75% off the retail price.

In fall 2005, with help from a DNR Solid Waste Reduction and Recycling Demonstration grant, the store hosted the first national ReStore conference. The conference attracted more than 200 participants from 34 states and Canada and helped spur the creation of other ReStores in Milwaukee, Waukesha and La Crosse, set to open beginning in spring 2006.

In addition to serving as a model for others, the ReStore has been an active community member in Madison. It offers "fix-it" workshops in the public library next door and has worked with the city and others on projects to reduce construction and demolition (C&D) waste. "I really like being a part of this community," Voichick said. "I feel like this store was a gift to this town." ■

Customers can browse through used or surplus building supplies such as doors at the Habitat for Humanity of Dane County ReStore in Madison. Photo by Sarah Murray.



Humane Manufacturing Company LLC

Baraboo and Janesville, WI



“At a recent trade show, one of our competitors came over and said our mats were the industry standard,” said Tonia Frenzel, marketing coordinator for Humane Manufacturing Company LLC.

The company is a rubber manufacturer that recycles farm- and truck-grade tires into products for end users. “We get our materials from all over the U.S.,” said Frenzel. Humane receives ground-up tires, which are then re-ground to remove any remaining impurities. “We go through 20 million pounds of tire material a year that would otherwise end up in landfills,” Frenzel said.

“We’ve doubled in size in the last five years,” Frenzel said.

The company’s workers mold rubber into mats and flooring for three primary industries: fitness, industrial and animal. Some of its products include rubber flooring for weight rooms, locker rooms and clubhouses; anti-fatigue mats for assembly lines or laboratories; roof-guard pads; machinery pads; cow, hog, horse and zoo mats; and basically any place that needs resilient or agility flooring.

Frenzel said there is a lot of growth involved with the rubber manufacturing industry, particularly with opportunities in fitness flooring. “We’ve doubled in size in the last five years,” she said.

Quick facts: Humane Manufacturing

Recycled materials used: farm- and truck-grade rubber tires

Recycling start date: 1972

Number of employees: 80

Contact: 1.800.369.6263 or 608.356.8336,
info@humanemfg.com

Web site: www.humanemfg.com



Workers push a full mold into a press at Humane Manufacturing’s Janesville plant. Photo courtesy Humane Manufacturing Company LLC.

The company has dealer networks that are both nationwide and also overseas. “Our dealer networks include Japan, Sweden, Puerto Rico, Jamaica and Afghanistan,” Frenzel said. Dealerships are pending in Norway, United Arab Emirates, Ireland, Lebanon, Saudi Arabia, Syria, Egypt, Jordan, Iraq and Kuwait. Frenzel explained that the company’s dealership with Japan was won with the development of a new product for the dairy industry. Humane also has products in several overseas military bases.

The company has two plants, in Baraboo and Janesville, with a total of 80 employees. Humane’s president, Keith Peterson, is a member of the Wisconsin Manufacturing Extension Partnership. “We are a lien manufacturer,” Frenzel said, “and several of our employees are lien certified.”

Humane Manufacturing was established in 1907 as a steel fabricating company for dairy farm equipment. In 1972, it began manufacturing rubber mats. In 1997, it sold off its steel division and now solely concentrates on rubber mats and flooring.

“We only use recycled materials,” Frenzel said. “We’re proud that our materials are made in the U.S.A.” ■



Kohler Company

Kohler, WI

“It’s very exciting to try to find new ways to use materials,” said Nathan Nissen, waste management supervisor for Kohler Co. While Kohler has been using and recycling scrap metal since it began in 1873, in recent decades it has added foundry sand, foundry slag, vitreous plumbing scrap, paper, cardboard and other materials to its recycling efforts.

Kohler employs 31,000 people worldwide, including about 8,000 at its headquarters in Kohler, WI. Nissen said the company devotes significant resources to its recycling efforts, including employees who sort scrap metal and haul recyclables to their destinations.

“Mr. Kohler places a very high priority on environmental stewardship, and believes in beneficial reuse initiatives,” Nissen said.

In addition to buying and selling scrap metal for its plumbing products, Kohler has sought ways to use some of its factory byproducts. One program uses materials like foundry sand and pottery cull (scrap plumbing material) to make structural fill, a material capable of supporting anticipated building loads. The fill has been used in several projects, including under new stores and as a screening berm at the 2004 PGA championship.

Kohler works with contractors and architects to help them consider the alternative material in construction projects. Nissen said the fill is “a known commodity, but not something that’s on autopilot,” and that Kohler is always looking for good projects in which to use the fill.

Currently, Kohler is looking into additional ways to reuse factory byproducts, including gypsum and foundry sand. The sand would be combined with paper mill sludge

to form artificial topsoil for use in areas such as reclaimed quarries, though Nissen said one challenge will be ensuring that such a material meets regulatory requirements.

“We’re just trying to figure out what the appropriate controls are to protect the environment,” he said.

Kohler also bales and sells paper and cardboard generated in its offices by the truckload.

Nissen said that finding new ways to use materials has many benefits, including saving money, conserving natural resources, avoiding environmental damage and providing the challenge of proving the recycled materials are as good as native alternatives.

“It’s good for the company, good for the environment and fulfills our corporate mission to be good environmental stewards,” he said. ■

“Mr. Kohler places a very high priority on environmental stewardship,” Nissen said.

Foundry sand (dark) and pottery cull (light) are spread as structural fill on a site for a Target store. Photo courtesy Kohler Company.



Quick facts: Kohler Company

Recycled materials used: foundry sand and other factory byproducts, scrap metal, pottery scrap, office paper, cardboard

Recycling start date: 1873

Number of employees: 31,000 worldwide; 8,000 in Kohler, WI

Contact: Nathan Nissen, 920.453.6312, nathan.nissen@kohler.com

Web site: www.kohler.com

Miller Brewing Company

Milwaukee, WI



Beer and recycling go hand in hand—the bottles and cans used to package the beverage are some of the most commonly recycled items. One prominent Wisconsin brewery is taking this relationship even further.

“Miller Brewing Company has a multi-faceted program dealing with sustainable development and working toward zero waste,” said Jim Surfus, a senior environmental engineer in Miller’s corporate offices.

He and Audrey Templeton, environmental coordinator at the company’s Milwaukee brewery, described Miller’s comprehensive approach to charting its resource use and finding ways to reduce, reuse and recycle. The company tracks performance indicators, such as the amount of waste going to landfills, at each of its breweries and works to educate its employees about recycling with a training video tailored to each facility.

The brewer recycles a wide range of packaging materials, including wooden pallets and large plastic bags. The Milwaukee brewery alone recycled about 3,100 tons of cardboard, glass and aluminum in fiscal year 2005.

Miller works with Cargill to find beneficial reuses for 100% of manufacturing byproducts such as spent brewer’s grain, used as animal feed, and spent brewer’s yeast, used in food products such as soups and



A truck loads spent brewer’s grain for use as a cattle feed supplement. Photo courtesy Miller Brewing Company.

Quick facts: Miller Brewing Co.

Materials recycled: brewer’s grain and yeast, glass, aluminum, plastic, paper, cardboard, pallets, electronics, other packaging; uses recycled content in packaging

Recycling start date: ranges from decades ago to last few years for different products

Number of employees: 1,700 at Milwaukee brewery; 5,800 worldwide

Contact: Audrey Templeton, 414.931.2409, atempleton@mbco.com

Web site: www.millerbrewing.com

gravies. In the future, Templeton said, the company would like to recycle aged beer and to digest spent brewer’s grain to produce energy-generating biogas.

Reducing the material in its containers saved Miller 100,000 tons of glass and 50,000 tons of aluminum a year.

Waste reduction is a priority, too. The company has reduced the amount of materials that go into its beverage containers, saving 50,000 tons of aluminum and 100,000 tons of glass per year company-wide. It also incorporates recycled content in those containers, and looks for materials that can be easily recycled.

While there are markets for most of the materials Miller recycles, Templeton said the main goal is waste reduction. “Our goal is to reduce the waste [going] to landfill, not make money on some of these products,” she said, noting that Miller looks at the long-term costs and benefits of resource use.

Cargill’s Scott Busch summed up the nature of recycling for a large company like Miller. “Overall, it’s a social responsibility,” he said. “If done right, it’s economically feasible for the operation, too.” ■



Minergy Corp.

Neenah, WI

Most people don't like to think about sludge, much less find a beneficial use for it. But Minergy Corp., a subsidiary of Wisconsin Energy Corp., has found a way to eliminate the environmental and economic liabilities of paper mill sludge while turning it into a usable product, generating energy and saving landfill space in the process.

At its 50,000-square-foot Fox Valley Glass Aggregate Plant in Neenah, the company converts sludge, a byproduct of the manufacturing process in eight nearby paper mills, into glass aggregate.

Minergy's Neenah plant is a world leader in producing glass aggregate and energy from paper mill sludge.

The plant is the first facility of its kind in the world and has been producing the aggregate since 1998. It receives up to 1,300 tons of sludge a day from the mills. In July 2005, it processed its 2 millionth ton of sludge, and turns out close to 60,000 tons of glass aggregate per year.

"We recycle high-volume sludges that have both an organic fraction and an inorganic fraction," said Bob Paul-

Quick facts: Minergy Corp.

Recycled materials used: paper mill sludge and municipal sludge (biosolids)

Recycling start date: 1998

Number of employees: 27 in Neenah plant; 40 total

Contact: Bob Paulson, 920.727.1919, info@minergy.com

Web site: www.minergy.com

son, the company's manager of business development.

After drying the sludge, Minergy uses a patented version of a process known as vitrification to convert it into glass aggregate. Two large cyclone furnaces melt the sludge, completely consuming the organic portion of the material to help fuel the process and produce steam, which is used to generate power for Minergy's plant and three nearby paper mills.

The process melts the remaining, inorganic portion of the sludge, which consists of ash, clay and other minerals, into liquid glass, which is then cooled into glass aggregate. The aggregate is then used in applications such as construction fill, roofing shingle granules, sandblasting grit, and concrete or asphalt additives.

Now, Minergy is adapting the technology for other uses, including a DNR-funded pilot project processing Fox River sediment contaminated with polychlorinated biphenyls (PCBs). The company is building the first large-scale commercial facility for processing municipal sludge in Zion, IL building on the technology used at the Neenah plant. Paulson said the technology could be attractive to other municipalities in the future, since it both reduces landfill costs and provides an alternative energy source.

Paulson said the market for the glass aggregate is strong. "It's taken us awhile to get here, but we certainly have strong local demand," he said. "Now our problem is we don't make enough of it." ■



Molten glass exits a cyclone furnace at Minergy's Fox Valley Glass Aggregate Plant. Photo courtesy Minergy Corp.

N.E.W. Plastics Corp.

Luxemburg, WI



Ever wonder where that milk jug ends up after you toss it in the recycling bin? One place might be your back deck.

RENEW Plastics, a division of the Luxemburg, WI-based N.E.W. Plastics, has been making plastic lumber and sheeting for decking, outdoor furniture, boat docks, animal stall liners and other products since the early 1970s.

"I feel that we can make the claim that we're the first plastic lumber manufacturer in North America," said vice president Lonnie Vincent. His father and mother, Irvin and Nancy, founded the company and developed the process for turning recycled high density polyethylene (HDPE) plastic resin—used in containers marked with the #2 recycling symbol—into plastic lumber.

"A lot of people feel that a recycled product is inferior," Vincent said. "That's a big fallacy."

Today, the company has 70 employees in its RENEW division and the capacity to convert 25 million pounds of recycled plastic a year into its products. "We've been growing at a rapid clip every year," Vincent said.

The finished products are colored throughout and UV-resistant, so the color will not fade. The company's Evolve plastic lumber is up to 96% recycled plas-



One of N.E.W. Plastics Corp.'s recycled products is a durable plastic liner for the inside edge of semis, which keeps loads from scuffing and scratching the sides.
Photo by Robert Queen.

tic and can be recycled again in the future.

The company sources recycled plastic—the raw material for the lumber—from around the upper Midwest, as well as from elsewhere in the United States and around the world. "It's a global marketplace," Vincent said. N.E.W. faces a special challenge because it demands clean, high-quality plastic resin for its products. "We always have a challenge finding good, high quality product," he said.

Related to this challenge, Vincent said, is educating the public on recycling and avoiding contamination of recyclables—such as leaving caps on plastic bottles—that can lead to lower quality raw materials.

"We are so demanding because we're putting out the premium product," he said. "We need the best quality recovered material."

Another challenge, Vincent said, is the expectation that products made with recycled material should be cheaper or are of lower quality than products made with virgin material. "A lot of people feel that a recycled product is inferior," he said. "That is a big fallacy. ... If you get the right material in and take your time in producing it, it will perform just as well or better [than other products]." ■

Quick facts: N.E.W. Plastics

Recycled materials collected: HDPE plastics (milk jugs, water bottles, etc.)

Recycling start date: 1973

Number of employees: 218 overall; 70 in RENEW division

Contact: Lonnie Vincent, 920.845.2326

Web site: www.newplastics.com,
www.renewplastics.com



Packaging Corporation of America

Tomahawk, WI

“We’re strong advocates in recycling where it makes economic and technical sense,” said John Piotrowski, a senior environmental engineer at Packaging Corporation of America’s Tomahawk plant. Using this model, the plant has undertaken a number of innovative recycling efforts in recent years, finding beneficial reuses for manufacturing byproducts as well as utilizing recycled fiber in its products.

The Tomahawk plant, which employs 440 people, is one of four pulp and paper mills owned by PCA, headquartered in Lake Forest, Illinois. The plant produces corrugating medium—the wavy layer in corrugated cardboard—which is sent to PCA’s 70 box plants to be made into packaging. Four of these plants are located in Burlington, Colby, Franklin and Milwaukee, Wisconsin.

“The quantity [of recycled fiber] in Wisconsin is far less than what this facility can consume,” Piotrowski said.

Piotrowski said the Tomahawk plant uses two types of recycled fiber: double-lined kraft (DLK), which comes primarily from the trimmings left over in box plants, and old corrugated cardboard (OCC) recycled by consumers. The Tomahawk plant alone uses 170,000 tons of DLK and 36,000 tons of OCC

Quick facts: PCA Tomahawk plant

Recycled materials used: recycled fiber, concrete, boiler ash, boiler cinders, biogas

Recycling start date: Mid-1900s for recycled fiber; past decade for other materials

Number of employees: 440

Contact: John Piotrowski, jpiotrowski@packagincorp.com

Web site: www.packagincorp.com



A pile of crushed concrete being recycled by PCA’s Tomahawk plant. The concrete is used in construction projects such as a new parking pad for semi trucks. Photo courtesy PCA.

each year. The finished paper has about 30–35% recycled content, depending on the grade.

“The quantity [of fiber] available in Wisconsin is far less than what this facility can consume,” Piotrowski said. PCA tries to source its fiber primarily from the Midwest, he said, but the recycled fiber market is increasingly global, and a large consumer like China can change prices overnight.

In addition to using recycled fiber, the Tomahawk plant has sought to utilize the byproducts of its manufacturing process. Initiatives have included using boiler ash for landfill cover material, using crushed concrete from old concrete slabs in construction projects, selling boiler cinders to asphalt companies to replace limestone chips, and collecting biogas from its wastewater treatment plant to burn in place of natural gas. The plant also recycles 12,000–15,000 gallons of used oil per year.

The Tomahawk plant has won several awards for its recycling initiatives, and Piotrowski said staff continue to look for “economically sensible and technically feasible” recycling opportunities. “We have made it a point to have a very aggressive and focused effort on recycling,” he said. ■

Plymouth Foam Incorporated

Plymouth, WI

Most people are familiar with the white foam packaging that surrounds new TVs and other products. They might be surprised to learn that the same foam may be an integral part of their home or office—and that it may be made out of recycled material.

The foam, known as expanded polystyrene or EPS, starts off as small beads that are expanded and fused, either into a precise shape or a large block that can then be cut. It is light, durable and a good insulator. Plymouth Foam Incorporated, a Wisconsin-based company founded in 1978, has helped lead the way in finding new uses for EPS—and in finding ways to recycle it.

“All of [our] products are touched by recycled material,” Hassel said.

“EPS is such a versatile material, we can’t even put enough effort behind all the ideas [for using it],” said company president Dave Bolland.

The company’s 200 employees, located at four facilities in Wisconsin, Minnesota and Ohio, produce a variety of products for markets in the United States and Canada using EPS and soft foam. These include protective packaging, foam components that are fully integrated into products (such as insulating liners in toilet tanks) and several types of building materials. Its PaceMaker Building Systems line, for example, includes foam-based, laminated panels that builders can quickly assemble into walls and roofs.

“All of those products are touched by recycled material,” said company vice president Jason Hassel. The products may contain anywhere from 10–100% recycled content, and some have certain characteristics that only recycled content can provide.

The company gets the recycled foam from a variety of sources. Some is scrap from its own cutting of EPS blocks into desired shapes, or scrap from large



Quick facts: Plymouth Foam

Recycled materials used: scrap or used expanded polystyrene (EPS) foam

Recycling manufacturing start date: 1978

Number of employees: 120 in Wisconsin; 200 overall

Contact: 1.800.669.1176

Web site: www.plymouthfoam.com

customers who do their own cutting.

Some local businesses and individuals bring their foam to the company’s plant for recycling, and Hassel, and Wisconsin plant manager Steve Steinpreis said they would like to see more of this in the future.

“We could grow into that recycling opportunity and we’d certainly like to,” Steinpreis said. “It helps us and it helps the community.”

The main challenge, they said, is figuring out how to get the foam back to the plant in a clean, usable form. “We have the technology to be able to handle the material as it comes back,” Bolland said. “It’s turning on the spigot. ... That’s the only major hurdle.” ■



Workers install Structural Insulated Panels (SIPs), made from rigid EPS foam sandwiched between two laminated board layers, on a roof. Photo courtesy Plymouth Foam.



Printpack Inc.

Rhinelander, WI

Can the wrapper from an ice cream bar be used to produce the lawn furniture you sit on to enjoy a summertime treat? The answer is yes, and Printpack Inc. of Rhinelander helps make it possible.

“We are a manufacturer of flexible packaging,” said Randy Delap, plant services manager at the Rhinelander facility, which is one of 22 Printpack plants around the world. The flexible packaging—used to cover products like candy bars and ice cream sandwiches—is made from polypropylene or polyethylene plastic film.

While new material is usually used to make the packaging, Delap said the company is able to recycle scrap film leftover from the manufacturing process. The film can be used in products such as plastic lumber, garden benches, lawn furniture and house insulation. In 2005, the Rhinelander plant recycled 500,000 pounds of the scrap film, along with an additional 750,000 pounds of other packaging materials, such as cardboard.

Delap said demand for the scrap film has varied over the 15 years the plant has been recycling it. One major factor has been changing oil prices, which affect the cost of plastics. “Right now, the market is

Quick facts: Printpack Inc.

Materials recycled: scrap plastic film used in packaging, other packaging materials

Recycling start date: early 1990s

Number of employees: 140 in Rhinelander; 4,000 overall

Contact: Randy Delap, rdelap@printpack.com

Web site: www.printpack.com

really strong because of oil prices,” he said. “We have no problem getting rid of it.” In the past, he said, Printpack would give the film away, but now the plant is able to charge a small amount for it.

“Right now the market [for recycled plastic film] is really strong because of high oil prices,” Delap said.

In addition to price fluctuations, Delap said storing the scrap film can be a challenge, since most customers won’t take less than a full truckload. The Rhinelander plant is considering purchasing a machine that could melt the scrap into a brick form, which would be easier to store and transport.

In the future, Delap said, it might be possible to incorporate recycled material into the flexible packaging. “We would be interested if the film industry would start making film with recycled material,” he said.

Along with the film and other packaging materials, Delap said the Rhinelander plant is able to distill and reuse the solvents from the inks used to print packaging. Overall, he said, the recycling efforts are generating \$50,000 to \$60,000 a year in revenue and saving on tipping fees. “Every penny counts,” he said, adding that the environmental benefits are also important. “It’s the right thing to do.” ■



Printpack uses rolls of plastic film to produce “flexible packaging” for candy bars and other products; it recycles the scrap film. Photo courtesy Printpack Inc.

Sadoff & Rudoy Industries, LLP

Fond du Lac, WI (headquarters)

“We’re the original recyclers,” said Tom Knippel, industrial marketing manager for Sadoff & Rudoy Industries, describing the scrap metal industry. “Metal recycling has been happening for thousands of years, all the way back to the Bronze Age.”

Sadoff & Rudoy Industries, LLP is a scrap metal processor that takes old or leftover metal objects and prepares them for use in the melt industry.

“We purchase scrap metal from manufacturers, auto salvage dealers and a network of scrap metal dealers across the country from coast to coast,” Knippel explained. “Our main process is to prepare these scrap metals for melt operations in steel mills, foundries and smelters.”

The company processes iron; steel; and nonferrous metals like copper, aluminum, brass and stainless steel. In addition, Sadoff provides architectural hardware and hollow metal doors to the building industry.

The markets are strong these days for scrap metal, according to Knippel. “Our customers for steel and iron are primarily in the Midwest,” he said. “Our non-ferrous customers are all across the U.S. and also in India and China.”

Sadoff has been in business under its current ownership since 1946. “We’re a third-generation, family-owned company,” Knippel said. The company has approximately 300 employees spread across 10 locations, nine in Wisconsin and one in Nebraska.

Quick facts: Sadoff & Rudoy

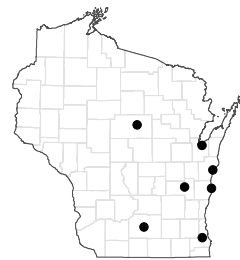
Recycled materials used: scrap metals, including aluminum, brass, iron, steel

Recycling start date: 1946

Number of employees: 300

Contact: Tom Knippel, 920.921.2070

Web site: www.sadoff.com



Workers load processed scrap for foundry deliveries. Photo courtesy Sadoff & Rudoy Industries.

Knippel said working in the industry can be somewhat challenging. He cited recycling items, like automobiles, that are not designed for recycling as an example. Airbags and mercury switches are two examples of the items that need to be removed from cars before they can be processed, he said.

**“We’re the original recyclers,”
Knippel said.**

Knippel said another challenge is the heavy regulation of the scrap metal industry. To help meet the environmental needs of the state, he said, Sadoff is trying to work with state regulators by signing a charter with the Department of Natural Resources’ Green Tier program, a partnership in which businesses sign agreements with the DNR to protect the environment in exchange for more flexibility with certain regulations. The company has received (or is in the process of receiving) several industry-based certifications for its environmental and health and safety practices.

“We’re committed to be the best we can be,” Knippel said. ■



Saint-Gobain Containers

Burlington, WI

“One of the neat things about glass is it can be melted and reformed an infinite number of times,” said Dana Kratz, human resources manager for Saint-Gobain Containers in Burlington.

The Burlington plant has been incorporating recycled glass into its bottles since it opened in 1966. Saint-Gobain has about 4,500 employees nationwide, with headquarters in Muncie, IN. Its parent company is the largest glassmaker in Europe, having gotten its start with a charter from Louis XIV to make mirrors for his palace at Versailles.

Saint-Gobain's Burlington plant employs 290 people and uses 40,000 tons of recycled glass each year.

The Burlington plant's 290 employees make bottles for well-known customers like Anheuser-Busch and Kikkoman. Kratz said the bottles typically have 15 to 20% recycled content.

Unlike other recyclable materials, such as plastic, the raw materials in glass (primarily silica sand) are inert and don't break down over time. While recycled glass is not always cheaper than new, it has other advantages—such as being easier to melt and thus saving on energy costs.

Quick facts: Saint-Gobain

Recycled materials used: glass

Recycling start date: 1966

Number of employees: 290 at Burlington plant; about 4,500 around the U.S.

Contact: Dana Kratz, 262.763.9161, dana.a.kratz@saint-gobain.com

Web site: www.sgcontainers.com



Glass bottles are manufactured and filled at the Saint-Gobain plant in Burlington. Recycled glass is incorporated into the containers. Photo courtesy Saint-Gobain Containers.

Kratz said the plant uses about 40,000 tons of recycled glass each year, nearly 90% of which comes from curbside recycling programs (the rest comes from recycling done within Saint-Gobain's 14 U.S. manufacturing plants). Glass processors sort the glass by color, clean it to remove contaminants such as metal caps, and crush it. The resulting material is known as cullet, and is melted and formed into bottles along with new glass.

Getting a sufficient amount of clean cullet can sometimes be a challenge, according to Kratz. “That is one of our limiting factors,” he said. In addition to the problem of contamination from metal caps or other foreign objects, the bottlemaker must ensure that colors are consistent in the cullet—for instance, the brown glass can't have too much green, or there could be a noticeable discoloration in the finished product.

Since glass can always be reused, recycling and removing caps and other contaminants is important, Kratz said. “There's no reason for glass to end up in the landfill,” he said. ■

Samuels Recycling Company

Madison, WI (headquarters)

Samuels Recycling Company recycles metal. Lots of it. “Our volume is 50 to 100% higher today than 10 years ago,” said president Mike Spear.

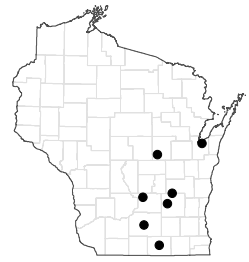
Since 1896, the company has been recovering scrap metals such as iron, steel, aluminum, brass and zinc from old automobiles, foundries, industrial scrap, old pipes and farming equipment.

“We break down products into forms of metal that can be melted by somebody else,” Spear said. The company breaks down its products by using electromagnets, which detect differences in metal conductivity (eddy currents) to separate the components. So when shredding a one-ton car, for example, the electromagnets can pull out about 1,500 pounds of iron and steel.

Once materials are separated, the company sells them to foundries throughout Wisconsin, and to steel mills in Indiana, plus other eastern states and Canada. Samuels Recycling also has overseas markets in China, India, South Korea and Japan. “We ship several thousand tons of iron and steel a month,” Spear said. “We export at least a million pounds to China alone. We’ve evolved into a global market. Now we look past the coasts. We’re looking



Scrap metal is stockpiled and sorted at one of Samuels Recycling’s locations. Photo courtesy Samuels Recycling Company.



Quick facts: Samuels Recycling

Recycled materials used: scrap metal, including iron, steel, aluminum, brass, zinc

Recycling start date: 1896

Number of employees: 250

Contact: Gary Bachus, 608.241.1571

Web site: www.samuelsrec.com

to Asia and South America.”

Samuels Recycling is a family-owned business that employs 250 people at seven facilities in Madison, Green Bay, Janesville, Waupaca, Beaver Dam, Waupun and Portage.

“Our volume is 50 to 100% higher today than 10 years ago,” Spear said.

Spear said the company faces several challenges, one of which is consolidation in the metals industry. “There are larger companies buying up smaller ones. As a result, we have fewer people to sell to,” he said. Other challenges include transportation and exportation of materials by rail, truck or sea, due to transportation costs and limited water access.

The company demonstrated its forward thinking by joining the Wisconsin Department of Natural Resources’ Green Tier program, through which qualified businesses and associations make legal commitments to superior environmental performance through contracts and charters with the DNR. In exchange, these businesses are given incentives to achieve their environmental goals.

“People should know about our commitment to this business and industry,” Spear said. “We are long-term thinkers. We continually educate ourselves.” ■



SCA Tissue

Menasha and Neenah, WI

“**W**hat some people view as waste, other people view as valuable raw material,” said Loreen Ferguson, recycle mill manager at SCA North America’s Menasha plant.

In this case, that raw material is paper that often ends up in the trash. “There’s still a fairly substantial amount of paper that’s in the municipal waste stream,” Ferguson said, estimating that paper products represent up to 21% of municipal garbage. Most of that paper could be used, she said.

SCA’s Menasha plant uses 1,000 tons of recycled fiber per day in its operations.

SCA, a Swedish-owned company whose Midwest Region headquarters is in Wisconsin, produces tissue products such as paper towels and napkins for the away-from-home market, which includes offices, restaurants and hospitals. All products are made from 100% recycled fiber. The company has about 53,000 employees worldwide, with approximately 1,000 in Wisconsin.

Ferguson said the Menasha operation alone uses 1,000 tons of recycled paper a day, including newspaper, card-

Quick facts: SCA Tissue

Recycled materials used: 20 grades of paper, including office paper, newspaper, old corrugated cardboard

Recycling start date: 2001 under SCA; Menasha plant has used recycled fiber since 1918

Number of employees: 53,000 worldwide; 1,000 in Wisconsin

Contact: Pat Bauman, 920.727.8791

Web site: www.sca.com

board and office paper—about 20 different grades in all. The plant buys recovered paper from about 50 different suppliers, and Ferguson said the company is always looking for additional sources, especially from Wisconsin.

Paper arrives at the Menasha plant in large bales, which are fed into a pulper and mixed with water until the material has the consistency of oatmeal. Next, it goes through cleaning machines that remove contaminants such as staples, and fine mesh screens to remove other contaminants. After further processing, the pulp goes to four tissue machines, which produce giant rolls of paper. These are then sent to a converting plant in Neenah, which processes the big rolls into consumer products.

“One of the biggest challenges is from the amount of contaminants present in the paper,” Ferguson said. Especially problematic are glues, adhesives and other “stickies,” including the “booger” glue used to attach credit cards in mailings. “Stickies are probably our biggest problem,” she said, noting it takes large capital investments in equipment to handle the contamination.

Despite such challenges, Ferguson said SCA is continuing to invest in its Wisconsin operations. “We’re very proud of being an environmentally conscious company,” she said. “We are dedicated to recycling and doing what we can for the community and the environment.” ■



SCA’s Menasha plant manufactures paper for napkins, paper towels and other products using 100% pre- and post-consumer recycled fiber. Photo courtesy SCA Tissue.

Veridian Homes

Madison, WI



Buy a new house from Veridian Homes, and you can thank recycling for the green lawn you see out front.

The Madison-area builder, which has won several awards for its environmental initiatives, has made a push in recent years to recycle more materials from its construction sites. That includes wood scrap, which is composted by the Bruce Company, a local landscaper. The compost is mixed with seed, fertilizer and stabilizing polymers and applied to lawn sites using a blower truck.

“It makes [economic] sense to go down the recycling road,” Zajicek said.

“We’re making a difference, and we’re making a difference with ourselves,” said Veridian vice president for construction Gary Zajicek. He said that there’s approximately a one-for-one trade at each home between the wood scrap and compost. Veridian has also worked to reduce the amount of wood scrap each project generates by using advanced framing and optimal engineering techniques, he said.

Zajicek said the recycling initiatives, which also include vinyl siding, concrete and cardboard, help Veridian’s bottom line. “We’re saving a lot on landfill



A worker recycles cardboard at one of Veridian’s building sites. Veridian also recycles wood, vinyl siding and other materials from new home construction. Photo courtesy Veridian Homes.

costs,” he said, adding that there’s a “snowball effect” for society when communities don’t need to create as much landfill space. “It makes great sense to go down the recycling road,” he said.

The demand is “quite high” for most of the materials Veridian is recycling, Zajicek said, though the market for vinyl siding scrap has been slower to develop. With help from a 2004 DNR Solid Waste Reduction and Recycling Demonstration grant, Veridian has worked with the Vinyl Recycling Institute to develop its vinyl recycling program, and is working with WasteCap Wisconsin to find more markets for the material.

“I think the vinyl could be a bigger market,” Zajicek said, adding that it will help if other builders start recycling the material as well.

Zajicek said recycling is a major commitment for Veridian and all of its contractors. “[The trades] are right there with us with this recycling effort,” he said. Veridian has 12 site managers, each coordinating recycling efforts, and individual contractors are involved with recycling the materials they use. “It’s very important to us to be very conscious and active in recycling efforts,” Zajicek said. ■

Quick facts: Veridian Homes

Materials recycled: wood scrap, vinyl scrap, cardboard, concrete

Recycling start date: 2003

Number of employees: 100-110, plus contractors

Contact: Gary Zajicek, gzajicek@veridianhomes.com

Web site: www.veridianhomes.com



Wausau Tile

Wausau, WI

When Columbia University approached Wausau Tile in 1999 with the idea of putting glass and concrete together, the company's staff probably never dreamed the result would be a product that garners \$1 million a year in sales. The key component in this valuable mix is recycled glass.

"We recognized that using recycled materials was the way to go these days," said Rodney Dombrowski, Wausau Tile's commercial division manager. "We thought it was a good risk to take with Columbia. We're pretty pleased now."

"We recognized that using recycled materials was the way to go these days," Dombrowski said.

They ought to be. Today, Wausau Tile's glass and concrete products are being used in several large commercial building projects across the country.

"Trump Towers used our recycled glass tiles for their balconies," Dombrowski said, "and the D.O.T. [Department of Transportation] building in Las Vegas used our recycled glass terrazzo tiles on its floors."

Wausau Tile's 330 employees incorporate 100% recycled glass into several of the company's products, including tiles, pavers, planters, exterior tables and benches, and waste receptacles. As an end user, Wausau Tile purchases about 200 tons of glass annually from suppliers in Arizona, Indiana and Tomahawk, WI.

The Tomahawk facility buys much of its glass supply from the Langlade County landfill. It also gets glass through Waste Management, Inc., which does curbside recycling collections in Green Bay, La Crosse and other parts of the state.

Employees at the Tomahawk facility hand-sorts

Quick facts: Wausau Tile

Recycled materials used: glass

Recycling start date: 1999

Number of employees: 330

Contact: Rodney Dombrowski, 1.800.388.8728,
rdombrowski@wausautile.com

Web site: www.wausautile.com

the glass into the pure colors that Wausau Tile needs. "We don't use mixed colored glass," Dombrowski explained. He said Wausau Tile needs pure, clear glass colors, such as all blue or all green. "The recycled glass we're using really makes our products very aesthetically pleasing," he said. "With our terrazzo tiles and pavers, we use aggregates out of good 'ol Mother Earth."

Unlike other products manufactured with recycled materials, Dombrowski said, Wausau Tile products have a high rate of visibility. "For the life of a building, people are going to be looking at our product, walking on it. It will be seen all the time." ■



Wausau Tile's pavers, made with recycled glass, were recently used in this Washington, D.C. Art Walk. Photo courtesy Wausau Tile.

Wisconsin Paperboard Corp.

Milwaukee, WI



“If you’re manufacturing paperboard, you’re dealing with recycled fiber,” said Robert Domrois, controller at Wisconsin Paperboard Corp.’s Milwaukee facility.

The Milwaukee mill has been using recycled fiber in its manufacturing process since it opened in 1911. Since 1976, it has done so under the ownership of The Newark Group, a Cranford, N.J.-based company with operations in North American and Europe. All of The Newark Group’s products, including those at Wisconsin Paperboard, are made from 100% pre- and post-consumer recycled fiber.

“If you’re manufacturing paperboard, you’re dealing with recovered fiber,” Domrois said.

The 160 employees at the Milwaukee plant, one of 11 Newark Group paperboard mills around the country, produce paperboard for a variety of uses and products, including cardboard tubing, folding cartons and other types of packaging (cereal boxes are an example of food packaged in paperboard), and store displays. Together, the 11 paperboard mills produce more than 1 million tons of 100% recycled paperboard each year.

Domrois said recycled paper content is common

Quick facts: WI Paperboard Corp.

Recycled materials used: pre- and post-consumer paper and cardboard

Recycling start date: 1911; since 1976 under The Newark Group

Number of employees: 160 at Milwaukee plant

Contact: paperboardmills@newarkgroup.com

Web site: www.newarkgroup.com



Wisconsin Paperboard Corporation’s Milwaukee plant produces paperboard for a variety of uses. Photo courtesy Wisconsin Paperboard Corp.

and expected in some products, such as cereal boxes. “People have gotten used to having recycled fibers in those products,” he said. When The Newark Group looks to new markets for its products, however, their 100% recycled content is often a selling point. “It’s more in the new markets that we develop that we’re trying to sell the benefits to our customers and potential customers,” he said.

Wisconsin Paperboard gets the recycled fiber for its products from both residential and business waste streams. “We get quite a bit of the curbside collection [of paper and cardboard] from Milwaukee and surrounding counties,” Domrois said. Stores and large businesses who bale their own cardboard for recycling also supply the Milwaukee plant. The Newark Group has a separate division (including a plant in Green Bay) that works to recover paper and cardboard in the waste stream and supplies the paperboard mills with much of their raw materials.

“Our entire company is based on dealing with recycled fiber as its raw material,” Domrois said. “That’s been our philosophy and the way we grew up.” ■

Resources and other success stories



Top: Students, teachers and sponsors from a Wisconsin Be SMART Coalition program. Photo courtesy Be SMART.



Left: Construction workers recycle metal on a building site. Photo courtesy WasteCap Wisconsin.



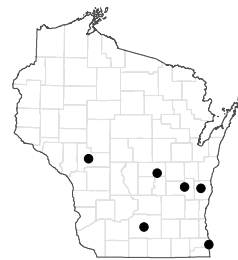
Left: Participants in the Madison Metropolitan School District's April 2005 waste sort.

Right: Volunteers sort waste at Spring Harbor Middle School in Madison. Photos courtesy MMSD.



Badger State Industries

Madison, WI (main office)



Using waste cooking oil from correctional facility kitchens to produce biodiesel is the latest recycling initiative from Badger State Industries (BSI), which has also been recycling and refurbishing computers and wheelchairs for several years.

BSI, the Wisconsin Department of Corrections vocational training and work skills development program, operates furniture, printing, textile and laundry shops at 11 state correctional institutions. In recent years, it has added computer and wheelchair recycling projects, employing about 100 inmates at facilities in Black River Falls, Fond du Lac, Plymouth, Racine and Redgranite.

The computer recycling program, which BSI estimates keeps up to 5 million pounds of equipment per year out of the landfill, began in 1996 with help from a DNR grant. Donations come from more than 200 schools, government agencies, nonprofits and private citizens.

Usable computer systems are refurbished and donated, with hard drives wiped clean to ensure data security. Unusable equipment is sorted and recycled by commodity. BSI partners with private industry and the UW-Madison SWAP (Surplus With a Purpose) to handle some surplus materials.



Badger State Industries plans to use a small commercial biodiesel processor such as this one to convert used cooking oil into biodiesel for delivery trucks. Photo courtesy BSI.

Quick facts: BSI

Recycled materials used: computer equipment, wheelchairs and handicapped bathroom equipment, cooking oil

Recycling start date: 1996 for computers; 2006 for public wheelchair recycling

Number of employees: 100 inmates

Contact: Tim Brown, Timothy.Brown@doc.state.wi.us

Web site: www.buybsi.com

In addition to the environmental benefits, Bernie Spiegel, director of prison industries, said there is a strong educational component to the refurbishing program, including a partnership with three community colleges to provide training and course credit for inmates.

The wheelchair recycling program takes in manual and automatic wheelchairs and handicapped bathroom equipment. All of the equipment is completely disassembled, cleaned, refurbished and reassembled, with broken or unusable equipment recycled. Madison Wheelchair Recycling then offers the refurbished equipment to individuals for a small donation.

BSI's newest initiative is to use waste cooking oil from its correctional institutions to produce biodiesel to fuel delivery trucks and farm equipment. BSI has been pilot-testing a blend of 20% biodiesel and 80% #2 diesel in one of its delivery trucks, and has found it not only saves fuel and reduces emissions, but also reduces engine wear through its lubricating properties, according to BSI's Paul Anderson. He estimated that the biodiesel mixture could save \$84 per week in fuel costs per truck.

Spiegel and other BSI staff members said their programs are intended to supplement and complement private industry, not compete with other recyclers. Still, BSI staff are excited about the possibilities.

"We've really taken recycling as one of the bigger parts of our future," Spiegel said. ■



Madison Metropolitan School District

Madison, WI

Sorting through the garbage may seem like an odd way to look for money, but that's essentially what the Madison Metropolitan School District (MMSD) did in April 2005. The district conducted a "waste sort" in four of its 46 schools as part of a DNR Solid Waste Reduction and Recycling Demonstration grant.

The sort revealed that a significant amount of recyclable material (ranging from 19% to 36% of the total garbage) was ending up in the trash and therefore adding to the district's landfill tipping fees.

"It certainly has been educational," said district building services director Doug Pearson of the district's waste-reduction project. Pearson said he was surprised at the number of recyclables he found in



MMSD building services director Doug Pearson weighs trash from a waste sort in April 2005. Photo courtesy Madison Metropolitan School District.

A waste sort in 2005 revealed that up to 35% of Madison schools' trash might be recyclable.

the trash during the waste sorts.

MMSD has been active in recycling for some time, Pearson said, but in looking to the future, it wanted to make changes and reduce costs for waste hauling and recycling. Pearson said environmental values played a role as well. "We are attempting to be one of the greenest schools in the country with our recycling and energy conservation efforts," he said.

Quick facts: MMSD

Recycled materials collected: cans, bottles, paper and other household recyclables

District size: 25,000 students in 46 schools

Contact: Doug Pearson, 608.204.7909, dpearson@madison.k12.wi.us

Web site: www.madison.k12.wi.us/bldgsrv/

Through February 2006, the DNR grant funded the purchase of 251 additional recycling containers and \$2,000 worth of outreach materials in the four model schools. Each model school has a recycling coordinator who makes decisions about the types of outreach materials (such as signs, posters and buttons) to use.

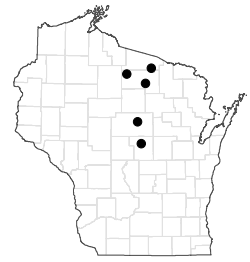
Pearson said the district would continue education efforts and collecting data throughout the 2005-'06 school year, after which he would analyze the data to see if district-wide garbage collection has changed and talk with staff about how the program could be improved. As part of its grant activities, the district will produce a video outlining the program and steps other schools can take for waste reduction.

In future years, the district hopes to increase the number and size of recycling containers in all of its schools. Pearson said some of the challenges with expanding recycling efforts will be costs, including the purchase of containers and labor costs for emptying them.

With annual tipping fees of around \$80,000, there is the potential for significant savings if all recyclable materials are kept out of the trash, Pearson said. But change will require education. "The big challenge is to get the message across to students," Pearson said. ■

Trig's Foods

Minocqua, WI (recycling center)



“The drive-through recycling center in Minocqua is convenient enough to leave no excuse for not recycling,” said Russell Hills, director of transportation for Trig’s Foods.

Trig’s is a multi-location conglomerate of supermarkets, gas stations and restaurants that is pioneering a recycling movement in the north woods of Wisconsin. Minocqua is also home to Trig’s drive-through recycling center, which has been operating for 13 years and is used both by small area businesses and families.

Hills and other Trig’s employees saw in Minocqua a clear need for a customer-friendly recycling center. Instead of utilizing an imposing Dumpster at the end of a vacation-home driveway, the public can visit the recycling center, which collects all sorts of recyclables from the public at no charge.

Free use of the recycling center is a financial benefit that can help Minocqua visitors and residents avoid paying a fee to disposal companies. “The recycling center is an extension of Trig’s positive customer service,” Hills said.

The recycling center collects and bales recyclables, then brokers out recyclables by the semi-load to a variety of companies, including metal, fiber and resin



Trig’s drive-through recycling center brings convenient and affordable recycling to Minocqua’s families, visitors and small businesses. Photo courtesy Trig’s Foods.

Quick facts: Trig’s Foods

Recycled materials collected: everything except hazardous waste, including shopping bags, plastic food containers, shrink wrap, cardboard, paper, vegetable oil

Recycling start date: recycling center opened in 1993

Number of employees: 14 in recycling center; many more throughout Trig’s locations

Contact: Russell Hills

Web site: www.trigs.com

processors. The center also accepts less profitable recyclables, such as glass, and often pays processors to accept shipments of these materials.

Hills emphasized that a true recycling center must exercise ‘complete recycling’ by accepting profitable and

“The recycling center is an extension of Trig’s positive customer service,” Hills said.

non-profitable materials. He said the company’s recycling center is challenged by a competitive industry in which markets are influenced by profitable recycling centers and greatly fluctuating demand for certain recyclables, such as petroleum-based products like plastic.

The company’s responsible recycling practices extend well beyond its recycling center. Vegetable oil from the company’s restaurants and delis is recycled and can be used as vehicle fuel. Day-old bread and bakery items are kept from the landfill and donated to local food pantries. Customers have access to recycling containers at all store locations and are paid five cents for each reused bag. Trig’s is making recycling a reality on all levels of their organization and is infusing the concept of responsible reuse throughout area communities. ■



WasteCap Wisconsin

Milwaukee and Madison, WI

More than 1 million tons of construction and demolition (C&D) waste ends up in Wisconsin landfills each year, according to a 2002 DNR study. WasteCap Wisconsin is working with businesses to try and change that, saving money and resources in the process.

Founded in 1996, WasteCap is a nonprofit organization with more than 70 member businesses, organizations and individuals. Its seven employees provide education, training and information-sharing opportunities to businesses in an effort to help them reduce waste and increase recycling.

WasteCap has saved its clients over \$1 million in avoided disposal costs.

While food waste and electronics recycling are also part of its mission, the majority of the organization's current work is in the area of C&D waste and recycling. Usually, this involves assisting an individual contractor or owner. "We're teaching them hands-on how to set up recycling programs on-site," said Susan Buchanan, WasteCap's executive director.

The organization has helped set up recycling programs for several large construction projects around the state, including the Epic Systems campus in Verona, the Overture Center in Madison, and the Weston 4 power plant in Wausau.

For each project, WasteCap has helped contractors reuse or recycle large amounts of metal, wood, cardboard, concrete and other materials, with significant cost savings. Through April 2006, it had saved its clients over \$1 million in avoided disposal costs and diverted more than 73 million pounds (36,500 tons) from the landfill.

WasteCap often partners with governments, foundations and businesses to develop markets for materials such as vinyl siding or drywall scrap. It has received DNR Solid Waste Reduction and Recycling Demonstration grants to

Quick facts: WasteCap Wisconsin

Areas of recycling focus: construction & demolition waste, electronics, food waste

Start date: 1996

Number of employees: 7

Contact: Susan Buchanan, sbuchanan@wastecapwi.org

Web site: www.wastecapwi.org

help with these projects. "As the markets appear, we do the research and try to put the permitting together to develop the markets," Buchanan said.

WasteCap has also worked with the U.S. Environmental Protection Agency to develop a new accreditation program in C&D recycling for construction professionals.

Buchanan said recycling programs can be hard to get off the ground. "The challenge by far is education ... really getting people to understand how to recycle and why to recycle and providing incentives to workers on these projects to recycle," she said. Once builders see the benefits, though, a program takes off. "They're really seeing this as the wave of the future," Buchanan said. ■



Workers recycle metal on one of WasteCap's projects. Photo courtesy WasteCap Wisconsin.

Wisconsin Be SMART Coalition

Southeast WI

The Wisconsin Be SMART (Save Money and Reduce Trash) Coalition is a partnership of local communities, state agencies, non-profit and environmental organizations, and businesses that provide leadership and promote actions that reduce waste, conserve resources, prevent pollution and foster sustainability in Wisconsin.

“We are a group of people working toward a goal of waste reduction,” said Be SMART chair Karen Fiedler. “Our coalition is pretty unique. I haven’t seen it anywhere else, where a group comes together to educate the public on waste reduction, and then promote specific action.”

“Our coalition is pretty unique. I haven’t seen it anywhere else,” Fiedler said.

Waste reduction is anything that reduces waste by using less material in the first place, according to Be SMART. It is doing simple things like using both sides of a sheet of paper, using reusable mugs instead of disposable cups or buying in bulk rather than individually packaged items. The end result is money saved, resources conserved, pollution reduced and landfill space saved.

“We started in 1995 as the Southeast Wisconsin Waste Reduction Coalition,” Fiedler said. “When the Wisconsin recycling law was passed, everybody was focused on recycling; no one focused on reduction.

Quick facts: WI Be SMART

Areas of recycling focus: waste reduction; improving recycling away from home

Start date: 1995

Contact: Karen Fiedler or Karin Sieg,
1-800-91SMART

Web site: www.besmart.org



The cover from a recent Green Pages, one of Wisconsin Be SMART coalition’s initiatives to raise awareness about waste reduction and recycling. Photo by Erol Reyat and courtesy Wisconsin Be SMART Coalition.

So reduction became our mission.”

Since its inception, the organization has been a warehouse of resources for the public for waste reduction, recycling and other related topics, which can be found on its Web site, www.besmart.org.

One such resource is “How to Recycle Away From Home.” State and local grants have helped the organization research ways to improve recycling “away from home” at places such as special events, and at work. The DNR recently awarded Be SMART a two-year Solid Waste Reduction and Recycling Demonstration grant to produce and distribute a Web-based “away from home” recycling toolkit.

The organization produces the annual “Green Pages” in the Milwaukee Journal Sentinel and Earth Day sections in two Jefferson County newspapers. “We’d love to see this go state-wide in other state newspapers,” Fiedler said.

Be SMART also sponsors a conservation scholarship challenge for southeast Wisconsin high school and college students to plan and implement waste reduction projects. Fiedler said in the future she’d like additional sponsors to expand this program state-wide. ■

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Goodwill Industries of SC WI, Madison and Monona
Habitat for Humanity of Dane Co. ReStore, Madison
Madison Metropolitan School District, Madison
Sadoff & Rudoy Industries, LLP, Madison
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Goodwill Industries of SC Wisconsin, Fort Atkinson

Kewaunee

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** Note: additional companies may recycle common materials such as glass and paper; they are listed here based on materials specifically mentioned in their profiles.*



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