

Matchmakers: Materials exchange programs

by Sherrie Gruder

Waste exchanges are both cost effective and environmentally beneficial.

Industry in the U.S. generates about 7.6 billion tons of solid waste and 300 million tons of hazardous waste each year. Currently, approximately 8,000 materials weighing 11 million tons are listed with materials exchanges.

These exchanges estimate that between 15 percent and 30 percent of the materials listed are exchanged for reuse and recycling. For example, CALMAX, the California waste exchange, reports that in less than two years it facilitated diversion of 152,000 tons from California landfills, saving participating businesses \$833,000. The potential for materials exchanges as a waste management tool is great.

Materials exchanges are burgeoning across North America. Currently, there are 42 materials exchange programs operating and an additional 30 are being developed, compared with 22 programs in 1992. (There are also 23 materials exchanges in Europe.) The materials, methods and usage of exchanges are rapidly expanding too. This article re-examines the how, what and where of waste exchanges in North America (see also, "Successfully simple: waste exchanges" in the April 1990 issue).

What is a materials exchange?

A materials exchange exists to help businesses

find a market or an end user for materials they no longer need. It's a listing system based for materials on the premise that one business's discards can be another business's feedstock. It is also a low-cost method of solid waste management.

Waste exchanges are source reduction programs; they enable businesses to use existing materials rather than virgin feedstock, thereby conserving valuable resources and keeping products from the landfill. In one example, a business that makes bird houses now obtains scrap wood for its production from a furniture manufacturing company.

In an example of disposal cost savings and source reduction, a Michigan furniture company — Herman Miller Inc. — generates 800,000 pounds of scrap fabric annually. Through a waste exchange with a North Carolina company, the material is now used as insulation for car-roof linings and dashboards. This exchange saves Herman Miller Inc. \$50,000 in landfill fees.

The most common type of materials exchange is actually an information exchange. Materials information exchanges do not physically handle the actual materials; rather, they compile information about available or wanted waste and surplus materials, and list that

information in catalogs or on an electronic bulletin board service. Businesses contact one another directly to establish the actual exchange. Listings can be confidential. Some exchanges also provide information about waste management goods and services.

A more active approach matches users with generators through telephone queries and provides technical assistance, e.g., with material substitution possibilities and innovative solutions. The Michigan ReSource Exchange Services and BARTER programs are examples of active exchange programs.

In a study of 259 businesses by the Rhode Island Department of Environmental Management, researchers found that 63 percent expressed interest in materials exchanges, although only 14 percent were purchasing materials that were part of another business's waste stream (1).

This gap was primarily due to a lack of awareness about the existence of the program or how to use it. This lack of familiarity with waste exchanges as an option for both acquiring materials or marketing them seems to be common across the U.S. However, increased efforts on a local and national scale to inform businesses about this effective waste management tool should help to bridge the gap.

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Types of materials available

Materials listed in materials exchanges are typically placed into 17 categories:

- acids
- alkalis
- other inorganic chemicals
- solvents
- other organic chemicals
- oil and wax
- plastic and rubber
- textiles and leather
- wood and paper
- metal and metal sludge
- lab chemicals
- construction material
- containers and pallets
- durables and electronics
- glass
- paint and coatings
- miscellaneous.

Traditionally, materials exchanges were a vehicle for moving industrial hazardous materials. Now, exchanges are increasingly used to market solid waste resources. Solvents are still the most exchanged material nationally. Regionally, different materials predominate for exchanges, e.g., textiles in the Carolinas, forestry products in the Pacific Northwest.

Materials exchange listings are fluid, changing from day to day. For this article, a snapshot of listings across North America for

The advantages of materials exchanges

Waste exchanges offer savings:

- ✓ To the business generating the waste, which avoids paying disposal costs and shipping costs, and frees up valuable storage space.
- ✓ To the business receiving the materials, which obtains less expensive feedstock and packaging.
- ✓ To the community, where landfill life is extended and hazardous chemicals are kept out of landfills and incinerators.
- ✓ To the environment, when fewer raw materials are used.

Other benefits:

- ✓ To entrepreneurs, who discover new ideas and opportunities to start new businesses or product lines.
- ✓ To businesses, whose corporate image is improved.

September 1993 was taken. A sample of types of listings available are noted in Table 1; the listings came from the National Materials Exchange Network database. (It should be noted that the activity of particular states and materials is more indicative of the exchange representing the state and the attitudes of certain industries rather than actual materials available.)

Not surprisingly, one of the two states with the most materials listed by NMEN was California. (The other top state was Iowa, perhaps reflecting the strength of the Industrial Materials Exchange Services, which serves 12 states.) In both California and Iowa, the three materials categories listed most frequently were plastics and rubber, wood and paper, and containers and pallets.

In contrast to Iowa, where nearly all materials were listed as available, California had more materials listed as wanted. (Nationally, the ratio of available to wanted listings is 4:1.) Texas and Washington had a 2:1 ratio of available to wanted materials.

Construction material made up 20 percent of Hawaii's 71 listings, reflecting hurricane debris recovery. In January, the state of Hawaii will host a conference on disaster-response debris management.

Some programs focus on a specific material category for successful exchanges. For

■ **Table 1 — Number and type of materials listings for selected materials exchange programs**

State/province	Number of listings (available & wanted)	Materials listed most frequently
Iowa	892	Plastics/rubber, wood/ paper, containers/pallets
California	872	Plastics/rubber, wood/ paper, containers/pallets
Washington	440	Inorganics, wood/paper
Texas	412	Solvents, metal sludges
Ontario	372	Organics, inorganics
Quebec	352	Lab chemicals, plastics/ rubber
Minnesota	304	Containers/pallets
Hawaii	71	Construction material

Source: National Materials Exchange Network, September 1993.

its 1993 efforts, the BARTER materials exchange program in Minneapolis-St. Paul targeted transport packaging, including pallets, wood crates, buckets, boxes, barrels, bags, envelopes, wood spools and polystyrene packing peanuts (2).

BARTER had surveyed hundreds of businesses and found out that 51 percent were disposing of packaging that is reusable. Most of the businesses that received used packaging materials through the exchange did reuse the materials for their intended use.

The Rhode Island study cited above found that exchanges between businesses of wood pallets and plastics are potentially most feasible. Also, the exchange of unwanted furniture and linens, especially from health care facilities to non-profit organizations, could be significant. Materials that businesses listed for marketing were diverse, including 400 pounds per week of fishheads from a marketplace, two tons per year of plastic bags from a manufacturer, and eight tons a week of wallpaper.

IMEX, a waste exchange servicing Seattle and King County businesses in Washington, brokered exchanges of plastic and rubber materials valued at \$90,000 in 1992, the single largest material category in value and second only to the miscellaneous category in activity (number of exchanges). The listings in the miscellaneous group include paints, with approximately 1,500 gallons per month of post-consumer latex paint from a single source — a several-county household hazardous waste collection program.

Among its miscellaneous listings, IMEX also includes lab bottles, computer diskettes, herbicides (from a golf course) and electronics — circuit boards and chips. One ton per week of feather dust from a feather cleaning company that upgrades feathers from Poland and China for down-filled products is also successfully exchanged — the feather dust is shipped from a Washington company to an Oregon composter.

Many materials exchange services are pas-

sive, simply passing on information about listings for the inquirer to find their own matches. A more active approach matches users with generators through telephone queries and provides technical assistance, e.g., with material substitution possibilities and innovative solutions. The BARTER and Michigan ReSource Exchange Services programs are examples of active exchange programs.

Matches don't always take place for all listings. The reasons were analyzed in a study of the Ontario Waste Exchange for Environment Canada (3). Among the reasons researchers found were that the amount of material available can be too little or too great, contamination levels too high and distance to market too far.

In one instance, a company wanted 3,000 tons per month of hardwood chips, an amount that could not be provided by a single supplier; in another example, a company offered 5,000 tires per hour — more than the demand by potential users.

In addition, for some material listings, limited or no markets exist, such as for a small quantity or a one-time availability of a particular material. For some materials-wanted listings, there is competition for the materials, such as for large quantities of nylon yarn waste (clean, single-polymer thermoplastics are in much demand).

The study identifies the need for research and development for those materials that have no technically viable market and for an active role of materials exchanges in finding solutions that will help match the materials available and wanted.

Programs and technology

Materials exchanges vary in how they operate and the types of services they provide. They also use a variety of funding sources, and administrative and organizational approaches. A summary of data on several materials exchange services in the U.S. is included in Table 2.

Materials exchange programs are proliferating. Many of the new exchanges will serve businesses in a local area and will play an active role in materials matchmaking, rather than relying on a statewide or regional exchange program.

North American exchanges in the development process include Alaska, California (two exchanges), Idaho, Maine, Maryland, Massachusetts (two exchanges), Minnesota

(three exchanges), Nebraska, New York (three exchanges), North Dakota, Nova Scotia, Ontario, Oregon, Pennsylvania, Quebec, Rhode Island, Tennessee, Vermont, Virginia (two exchanges), Washington, West Virginia (two exchanges) and Wisconsin.

The use of automated communication systems is increasingly the way materials exchange business is done. E-mail, fax, modem, phone and mail augment the use of catalogs to publicize listings. The National Materials Exchange Network (see the sidebar) receives an average of 74 calls per day, of which 11 are first-time callers. In the first nine months of 1993, there were 22,000 E-mail messages sent between users of the national exchange, and NMEN received 12,000 modem calls from businesses. Also, there were 2,200 system inquiries or matches and referrals in that time period.

Conversion software was recently developed by Patrick Moctezuma of NMEN that allows a listing to be placed on-line directly to both the local and the national database (rather than entered twice). This enables the local exchange to manipulate the data locally for reports and then translate it into camera-ready copy for catalog printing. Exchanges that are in development can use

National Materials Exchange Network

The National Materials Exchange Network is a cooperative effort of 42 materials exchanges across North America. NMEN offers an on-line national database containing over 5,200 listings of materials available and wanted (in a 4:1 ratio) in 17 categories.

NMEN's bulletin board service is operated by the Pacific Materials Exchange, a nonprofit corporation based in Spokane, Washington, through a grant from the U.S. Environmental Protection Agency. Companies in any state can list materials directly in the network or by listing with a local exchange.

NMEN has several advantages: There is no charge for the service; it is available 24 hours a day; it provides exposure throughout North America; listings are more current than printed catalogs and access to them, through modem, is quicker.

NMEN lists materials available and needed, including waste by-products; off-spec, overstock, obsolete, and damaged materials; and used and virgin solid and hazardous waste.

To list with NMEN, use any computer with a modem. Any business or industry may list materials directly by calling (800) 858-6625. There is also a help line number: (509) 325-0551.

■ **Table 2 — Selected material exchange services**

Organization	Source of funds (2)	Budget in \$1,000s	FTE (3)	Information access (4)	Promotion	Listing fees	Notes
BARTER (Business Allied to Recycle Through Exchange and Reuse), MN Public Interest Research Group, Minneapolis & St. Paul, MN, (612) 627-6811	S,C,Co	N.A.	1.5	QC	Brochure	No	Focuses on small businesses, develops markets and provides recycling information.
BAWSS (By-Product and Waste Search Service), Iowa Waste Reduction Ctr., Cedar Falls, IA, (800) 442-3109	S,U	\$305	3	Q insert in IWRC newsletter	Brochure, contact	No	Personal contact via regional field representative, phone outreach, 800#.
CALMAX (California Materials Exchange), California Integrated Solid Waste Mgmt. Board, Sacramento, CA, (916) 225-2369	S	N.A.	2	BC	Brochure, conferences	No	Since 1992. Catalog includes recycling information and successful exchanges.
IMES (Industrial Materials Exchange Service), Illinois Office of Pollution Prevention, Springfield, IL, (217) 782-0450	S	\$120	1	BC, BBS	Brochure, individual states	No	Serves 12 states.
IMEX (Industrial Materials Exchange), Seattle-King County Department of Public Health, Seattle, WA, (206) 296-4899	S	\$150	2.5	BC	Mail, referrals, conferences	No	Serves WA,OR,BC and part of ID.
Louisiana/Gulf Coast Waste Exchange, Louisiana State University, Baton Rouge, LA, (504) 338-4594	P	\$120	1	B insert in trade journal	Seminars, conferences, brochure	No	Funding from government and private sponsors.
MIWE (Montana Industrial Waste Exchange), Montana Chamber of Commerce, Helena, MT, (406) 442-2405	S	\$5	5*	B newsletter	Brochure, chamber publication	No	Run through MT Chamber of Commerce; focuses on industrial waste.
NIWE (Northeast Industrial Waste Exchange), nonprofit corporation, Syracuse, NY, (315) 422-6572	Fed,S(5), Co, UF	\$300	3-5	BC, BBS	Promotion in various media	Yes	Serves 12 states and Puerto Rico.
National Materials Exchange Network, PME (Pacific Materials Exchange), nonprofit corporation, Spokane, WA, (509) 325-0551	EPA, UF, P	\$150	3	BC	Mail, workshops	No	National BBS for 42 exchanges. Nonprofit runs both PME and NMEN.
RENEW , Texas Water Commission, Austin, TX, (512) 463-7773	EPA, S, Ads	\$120	1.5	BC	Brochure	Yes	Works with other exchanges in US and Canada. Publishes new listing between catalogs.
SEMREX Materials Exchange, Winona County, Winona, MN, (507) 457-6460	Co (start-up grant from S)	N.A.	.25*	QC	Brochure	No	Focuses on nine Southeast MN counties. Will service WI businesses.
Southeast Waste Exchange Urban Institute, Univ. of NC, Charlotte, NC, (704) 547-2307	Univ, Co, S (varies)	\$150	2	BC, BBS	Conferences, brochure	Yes	Since 1978. Provides waste exchange and recycling aid, locally and abroad.
SWIX (Southern Waste Information Exchange), Florida Chamber of Commerce, Tallahassee, FL, (800) 441-7949	S,Co Univ, P, Ads	\$100	3	QC,BBS	Brochure, mail	No	Collects and lists waste management program information. 800#.
West Michigan Waste Exchange, Resource Recovery Committee, Grand Haven, MI, (616) 846-8135	Co, Bus	N.A.	1*	In-person exchange	Ads, mail, brochure	Yes	Annual expo since 1990. Herman Miller Inc. partly subsidizes committee's program.

N.A.= Not available.

(1) All accept exchange listings for both hazardous and nonhazardous wastes, with the exception of SEMREX, which accepts nonhazardous waste listings only. BARTER also lists construction wastes..

(2) S = state, C = city, Co = county, Bus = business; P = private and public sponsors; UF = user fees; Univ = university; Ads = advertising; Fed = federal agencies, EPA = U.S. Environmental Protection Agency.

(3) FTE = Full-time employees. Asterisk indicates that exchange duties are only part of FTE's jobs; time allocated for exchange tasks are less than full-time.

(4) Listings are made available to businesses and the public: Q = quarterly or B = bi-monthly; C = catalog or BBS = electronic bulletin board service.

(5) This exchange is composed of five states.

Source: Solid and Hazardous Waste Education Center, Cooperative Extension Service, University of Wisconsin-Extension, Madison, Wisconsin, 1993.

this software in implementing their programs; some programs that are already in operation are retrofitting their systems to adapt their software.

The NMEN system also tracks system inquiries or the expressed interest of users in a particular material (as opposed to businesses that come on-line just to scan listings, but don't extract contact data). This feature will help gather data on the rate of successful exchanges, providing a list to follow up. Thus far, materials exchanges have had limited staff and time to gather such data, which would be important to show the efficacy of materials exchange as a tool for solid waste management and justify program funding and staffing. Information about successes can illustrate options for materials uses to other businesses.

Opportunities, trends and challenges

The use and success of materials exchange is a function of the number of people looking for opportunities and their imagination. Recently, materials exchanges have been used for humanitarian aid purposes: material to make sandbags needed because of summer flooding of rivers in the Midwestern U.S., textiles for Florida hurricane victims, and mattresses from a bedding company for a homeless shelter.

In other innovative uses for materials available from exchanges, CALMAX is developing an exchange to provide materials to California schools — KidMax. And ArtStart, a nonprofit arts education organization, is able to provide low-cost reuse materials to the arts community of Minneapolis-St. Paul from the BARTER exchange program.

Several challenges face materials exchange programs as they work to become a potentially powerful source reduction tool: They need to:

- get the word out to businesses that materials exchanges exist and how to use them
- overcome corporate inertia by expanding businesses' visions of opportunity and their attitudes toward reused materials
- educate industry about quality control of materials
- become financially self-sufficient
- document their successes by collecting follow-up data through a standardized (and automated) system of accounting, including information on activity, number of successful exchanges, estimated value of individual exchanges, avoided disposal, tonnages and costs, plus the cost of virgin materials replaced by the exchange materials.

The economics of using materials exchanges — the fact that they save business-

es money and help avoid liability — is a strong motivator for their use. Industry shows great interest in this tool, once industry learns that it exists. Businesses that recognize the opportunities they have through materials exchange will be the ones to benefit and prosper.

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End notes

- (1) Rhode Island Department of Environmental Management and Brown University Center for Environmental Management, *Mandatory Commercial Solid Waste Recycling: Rhode Island Case Study*, September 1993.
- (2) BARTER, *Materials Exchange Catalogue*, Volume 12, No. 2, Fall 1993.
- (3) Environment Canada, *Identification of Opportunities for Increased Efficiency of Waste Exchange*, April 1993.

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Two East Coast dealers recently interviewed by *The Paper Stock Report* disagreed slightly about paper market conditions, but one thing they do agree on is that prices across the board are still low.

The disagreement: One dealer says that between a recession in Europe and a near depression in the Far East, export business has remained nonexistent. The other dealer says that export is much like conditions at home — there is movement, but not at prices most dealers would like.

What they and everybody else do seem to agree on is that prices are not getting any better as the U.S. economy continues to limp toward year's end. *The Paper Stock Report's* survey of scrap paper dealers revealed that overall recovered paper prices are at the lowest point of 1993. The average scale price paid by processors for all grades was \$22.69 at the end of September. That figure includes all grades of post-consumer material delivered to dealers, from negative-value mixed paper and newsprint to high-grade deinking papers. All grades surveyed saw declines except old magazines, which edged upward, and colored ledger, which leveled out at a national average of \$22.74 a ton, an insignificant improvement over the August figure.

Picky, picky

And if low prices for all grades of recovered paper aren't enough for dealers and brokers to face, some are finding that their customers getting more and more picky about quality, making some grades even harder to move. "When the markets get sloppy, mills get more picky, because they can't afford to have problems either," says Jim Hines, director of procurement for Sonoco Products. "Everyone is watching money these days." But he adds that for some, especially in paperboard, it's going beyond that. Tighter specifications for old corrugated containers mean dealers and mills have to watch what gets into bales.

As the country has begun recycling more and landfilling less, Hines notes that not all the scrap paper that is collected has the quality it once did. Jim Ramsey, of Great Niagara Paper, Williamsville, New York, says the hesitation

he's experienced because his buyers are so fussy, especially with old corrugated containers (OCC), has gotten frustrating. "What I'm getting right now is really good," he states. "It's some of the best OCC I've seen."

News blanked

For Ramsey, the most difficult grade to move lately is news blank. The grade has not been good for the last year, but Ramsey says that recently backed-up inventories have made matters worse. Critical buyers have come into play here too. "I have some rolls that I've sold twice and they've come back," he notes. "I just can't get rid of them. I just moved them and they were rejected again."

Joe Jiminez, of Elof Hansson Pulp Inc., New York, says he can't move his news blank either. Three or four months ago he could find a home for everything he had. Market conditions, he remarks, are not better than they've been for three-and-a-half years. "Purchasing agents at the mills don't see anything changing for awhile," he says. "They have big inventories and they're getting offers from all over." According to Jiminez, the only way prices are going to change is if pulp prices improve. But pulp recently was discounted even further, and a lot of mills are buying pulp and using as little recycled fiber as necessary. That's not true across the entire country, however.

Inland Empire Paper Co., of Millwood, Washington, apparently hasn't changed its routine. Purchaser Shirene Cross says the mill is not sticking with West Coast material, but rather is drawing scrap paper from as far away as the Midwest. The mill does not have much difficulty in getting what it needs. Cross says the mill is keeping busy, its finished product is sold out and she feels prices overall are quite fair. "I'm hearing some rumblings about them raising the price but I don't know why," she says. "For our volume, things are fine, but Boise Cascade is buying a little more now that [the Beloit joint-venture deinking plant] is on line, so maybe that's why the rumors have started."

Generation down

Great Niagara's Ramsey notes that he's found himself catering to people who call with special orders a mere four times a year and ask for a break on price. "You work on smaller

margins and maybe spend more time with the people you might not bother with otherwise," he notes. He says that kind of persistence has earned him nearly a year of business moving an unusual mix of OCC with boxboard. A company was getting rid of scrap paper, and Ramsey managed to beat a competitor for the paper and to find a home for it. "I've been able to move it to this mill, so I don't want to up the price."

Pat Pepe, of P. Pepe Sons, Newark, New Jersey, notes that scrap paper generation has declined drastically in recent weeks. "Customers who usually schedule two or three pickups a week, I'm lucky if we have one a week now," he says. With many companies laying people off, scrap generation is down as much as 25 percent. But no shortage has developed, because mills that don't have any orders for their finished product don't need the scrap paper anyway. An overall lack of business has forced some companies to close, Pepe remarks. "We had one across the street close up and move to Florida."

Pepe has traditionally shipped as much as 90 percent of his scrap overseas, but he said the export market has not been friendly to him, and his search for new customers has reduced his overseas shipments to 55 percent of his business. And to ship even that much overseas takes a lot of work. "We have contracts all over," he says. "We ship to South America, the Middle East, the Far East, even Canada. It changes rapidly. What is good this month will be gone next month."

Domestic markets not rosy

The situation changes fast domestically too. Pepe says he has been shipping to a customer in Pennsylvania for years. This month they were closed out. But to another East Coast dealer, the majority of high grades is continuing to move rather well even if prices are low. Yet another says the real difficulty is that orders are coming per load, rather than on a continuous delivery schedule. "It's not like in 1982 when all the warehouses were backed up," states Tom Bowers of Schirmer Paper Corp., Boston, Massachusetts. "But you don't have the continuity in orders like you usually do."

Richard Moore of United Paper Stock, Columbus, Ohio, notes that the only grade that appears to be moving at all is ground-