



RECYCLING AT WORK:

**Creating a Cost-Effective
Recycling and Waste Reduction
Program for Businesses**

eco-cycle

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INTRODUCTION

The average office worker consumes 10,000 sheets of paper each year. Twenty-five billion Styrofoam cups end up in landfills every year, many of which come from office break rooms and cafeterias. It's no secret that businesses are significant waste generators. In fact, about 40% of the waste stream in the United States is generated by businesses. The decisions businesses make about how to protect natural resources through recycling and other waste reduction methods are simply among the most important they will make.

The following manual was created to assist the business community in two ways. First it is meant to help businesses begin or improve upon a recycling program. Second, it is meant to provide recycling companies with information on the best ways to collect, process and market recycled material in Colorado. The goal is to provide a useful tool for these companies to improve recycling in the state, thereby saving natural resources and precious landfill space.

Most employees want to recycle at work just like they do at home; however, they need the infrastructure and company support to do so. With the assistance of a Green Team and a Recycling Coordinator, an effective recycling program can be developed that is responsive to employee needs. Making a recycling program easy to use and understand will foster high participation, especially if the environmental value of the program is communicated to employees. In addition, gaining upper management support for recycling and including recycling in the mission statement can set the tone for all employees to recycle. Involvement must include the cooperation of other departments such as Human Resources and Facilities Management.

This manual will help businesses develop an environmental policy; it will guide them through the basics of setting up a convenient in-house recycling program; it will provide resources for "closing the loop" through the purchase of recycled products; and, perhaps most importantly, it will give businesses strategies and tactics for reducing and reusing before recycling even becomes an option. The manual's resources will help businesses get started and keep them on track with a waste reduction program.

Acknowledgements

The following manual is intended to help businesses and recycling companies develop a cost-effective recycling and waste reduction program. The information that follows was gained through independent, exhaustive research on the "best practices" of collecting, processing and marketing recycled material. In addition, data was collected from a one year pilot study involving the recycling programs at three companies: OmegaTech, of Boulder, Colorado, NetLibrary of Boulder, Colorado and StorageTek of Broomfield, Colorado. The authors of this manual would like to recognize the cooperation and assistance of these companies and commend them for developing effective recycling programs. A special thanks is also extended to Peter Anderson of RecycleWorlds Consulting of Madison, WI.

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Why Recycle - Cost savings

An integrated approach to recycling and waste reduction can provide appreciable cost savings to businesses. Initial costs to get the service “up and running” will, in the long run, be offset by reduced trash disposal fees and less waste creation. Such a visible commitment to the environment will also result in intangible benefits to employee morale and your company’s public perception.

Start-up costs, which in many cases are covered by the monthly charge paid to a service provider, can include the purchase or leasing of recyclables storage containers, container signage and employee education literature, and the cost of transporting recyclable materials to an off-site processing facility. These are the same costs one would expect when contracting for trash disposal service. Recycling at its simplest is transferring material out of the waste stream and giving that material new life to be re-used or re-manufactured into new products. Thus, as the volume of trash generated decreases, a company’s associated cost of disposing of that trash will also decrease.

Paramount to establishing a successful business recycling program that maximizes cost efficiencies is active employee participation. The more your employees both recycle and reduce the amount of waste they create in the first place, the more your trash disposal cost will decrease, thereby benefitting your program and your bottom line. Integrating recycling and waste reduction techniques into your daily operating procedures and the culture of your business will ensure that your employees are saving the company money while they do the right thing for the planet. Ongoing employee education becomes the primary vehicle to ensure the success of your program.

The bottom line: A business recycling and waste reduction program can be cost effective if it is carefully planned and coordinated with staff and employees. While this may appear to be a daunting task, numerous resources exist to assist with the development of an efficient program with achievable goals.



The more your employees both recycle and reduce the amount of waste they create, the more your trash disposal cost will decrease.

Why Recycle - Environmental Benefits

The environmental and economic premise of recycling is sound: re-using natural resources over and over again after they have been extracted from the earth makes good sense. By conserving the dwindling supply of these resources and protecting the few remaining undamaged ecosystems left on the earth, we are preserving them for future generations. Overall, the processes used to make consumer goods from recycled material instead of raw resources is much more energy and water efficient. For example, recycled paper uses 60-70% less energy than virgin pulp and 55% less water. Also, making recycled products reduces greenhouse gas emissions and the need to build landfills.



Recycling helps lessen the burden on our natural resources.

Consumer products do not benignly arrive on store shelves with no impacts attached. In fact, making goods from natural resources can cause great harm. The destructive nature of mining, logging and drilling in fragile natural habitats to produce goods that will only be used once and then thrown away is extremely wasteful. For instance, for every garbage can placed at the curb, there are 71 cans of waste created in the extractive and industrial processes used to convert raw materials into finished products and packaging. Simply put, making paper from paper, cans from cans and plastic from plastic is infinitely kinder to the earth than clearcutting a forest in the Pacific Northwest, mining for bauxite ore in South America or drilling for oil in the Arctic National Wildlife Refuge.

Recycling not only saves precious resources but also avoids the toxic processes used to turn these resources into consumer products. For example, producing paper from trees requires chlorine to remove lignin from wood. This process produces dioxins, a known carcinogen. On the other hand, recycled paper already has the lignin removed and only requires using hydrogen peroxide to remove ink.

Keeping waste out of landfills also makes economic and environmental sense. One in five Environmental Protection Agency Superfund cleanup sites is a landfill. Contaminated with tons of toxic material, these landfills have cost taxpayers millions of dollars to clean up and monitor, a process that is likely to continue for many decades into the future. For industry experts, the question isn't if a landfill will leak toxins, but when. Therefore, recycling to avoid landfill disposal helps avoid environmental and public health threats down the road.

Although recycling makes far more sense from an economic, industrial and environmental perspective, the extraction industry is heavily subsidized by taxpayers which forces recycled products to compete on an unlevel playing field in the marketplace. Because of this, recycled products can sometimes cost more than their virgin counterparts.

Recycling and Environmental Facts

- Recycling 1 ton of paper saves 17 trees, 2 barrels of oil (enough to run the average car for 1,260 miles), 4,100 kilowatts of energy (enough power for the average home for 6 months), 3.2 cubic yards of landfill space, and 60 pounds of air pollution. Trash to Cash
- Americans throw away enough aluminum to rebuild our entire commercial fleet of airplanes every 3 months. Environmental Defense Fund
- About 80% of what Americans throw away is recyclable, yet our recycling rate is just 28%. Environmental Protection Agency
- Over 1/2 million trees are saved each year by recycling paper in Boulder County. Eco-Cycle
- There are more roads in our National Forests than the entire U.S. Interstate Highway system. National Forest Protection Alliance
- Recycling creates 6 times as many jobs as landfilling. Colorado Recycles
- Recycling glass instead of making it from silica sand reduces mining waste by 70%, water use by 50%, and air pollution by 20%. Environmental Defense Fund
- Recycling just one aluminum can saves enough energy to operate a TV for 3 hours. S. Carolina Electric and Gas Co.
- If we recycled all of the newspapers printed in the U.S. on a typical Sunday, we would save 550,000 trees—or about 26 million trees per year. California Department of Conservation
- The energy saved each year by steel recycling is equal to the electrical power used by 18 million homes each year - or enough energy to last Los Angeles residents for eight years. Steel Recycling Institute
- If every household in the U.S. replaced just one roll of 1,000 sheet virgin fiber bathroom tissues with 100% recycled ones, we could save: 373,000 trees, 1.48 million cubic feet of landfill space, and 155 million gallons of water. Seventh Generation Co.
- The U.S. is 5% of the world's population but uses 25% of its natural resources. Environmental Protection Agency



Landfills can leak toxic sludge into groundwater.

Five Steps for Starting Your Waste Reduction and Recycling Program

Before implementing a recycling and waste prevention program, it's important to establish a method for developing, instituting, and evaluating your program. These basic steps will help guide this process:

1. Gain Top Management Support

Without support from top management, a program cannot fully succeed. Employees should request a meeting with management and stress the benefits of recycling and waste reduction. For example, these benefits may include cost savings from less frequent trash pick-ups and an enhanced company image that comes from concern for the environment. Also, most employees probably recycle at home and expect their employer to do the same.

A sample memo from the CEO to all employees announcing a recycling and waste reduction program can be found in the Appendix to this manual.



2. Choose a Recycling Coordinator and Team

Choose an enthusiastic coordinator and a team representing employees of all levels and all departments. Be sure to include members from purchasing, maintenance, custodial, facility management, shipping/receiving, and marketing. Recruit volunteers for their departmental expertise and their interest in implementing waste reduction strategies. Some of the primary duties for your team will be:

1. Conducting a waste assessment or a “walk through” of the office;
2. Establishing goals and priorities;
3. Promoting recycling and waste reduction awareness;
4. Working with buyers and suppliers to reduce packaging and other waste;
5. Implementing reuse systems and altering other waste generating activities wherever possible;
6. Monitoring, evaluating, and changing the system as needed.

3. Conduct a Waste Assessment

A waste assessment characterizes the waste – and recyclables– generated by your business. You can either opt for a professional audit in which the trash is sorted and weighed or you can do your own informal assessment by simply walking through buildings and visually inspecting the trash and recycling bins. Purchasing, inventory, and waste disposal records can give clues as to how waste is being generated. Also, valuable information can be learned by talking with key employees and observing operating procedures.

4. Establish Goals and Priorities

Initially choose one to three highly visible changes which can serve as “quick wins.” Celebrate these early successes loudly and with a lot of fun. For all your goals, short and long term, consider the following:

1. Ease of implementation
2. Initial cost and expected pay-back
3. Employee cooperation
4. Relationships with suppliers
5. Customer relations goals
6. Flexibility in your waste disposal contract
7. Anticipated quantity of preventable waste
8. How to track success

5. Set up a Program

The recycling infrastructure at a business must be emphasized more than the trash infrastructure. In other words, recycle bins must outnumber and often be bigger than trash cans. This is especially true in offices in which most discards are recyclable, such as paper and beverage containers. Recycle bins should be a different color (and different shape if possible) than trash bins. For example, blue bins with a round opening typically hold bottles while a slotted bin might be for paper.



It is also key to meet with janitorial service to coordinate the program and obtain cooperation - recycling won't work if the custodial team is throwing away recyclables collected by employees.

For recycling to work it must get regular attention at staff meetings, in company emails, and in other forms of communication. It is the Green Team's responsibility to make sure recycling gets the attention it needs.

To make sure that a program is implemented effectively:

1. Announce new policies and practices through upper management;
2. Provide employees with the resources and equipment they need;
3. Train and educate employees;
4. Offer employees incentives and rewards;
5. Create a Green Team "To Do" list along with a timeline.

The following lists the typical recyclables generated by businesses. Collection of these items may differ depending on your geographic region:

- Newspaper
- Office paper
- Junk mail
- Cardboard
- Cans
- Glass bottles
- Plastic bottles
- Magazines
- Catalogs
- Phone Books



Items like light bulbs and batteries can be recycled too. See the Appendix for sources on these and other odd recyclables.

Three Steps for Maintaining a Recycling Program

Sample Environmental Policy

Agilent Technologies Environmental Policy

Agilent Technologies is committed to conducting its business in an ethical, socially responsible and environmentally sustainable manner. This commitment is consistent with our corporate objectives and is essential to continued business success.

Our environmental objective is to provide products and services that are environmentally sound throughout their lifecycles and conduct our operations worldwide in an environmentally responsible manner. All Agilent Technologies managers and employees are expected to support implementation of this Policy in accordance with their roles and responsibilities in the organizations.

The following courses of action facilitate our compliance with this

- Design our products and services to be safe to use, to minimize use of hazardous materials, energy and other resources, and to promote recycling or reuse.
- Conduct our operations in a manner that is committed to pollution prevention, conservation of resources, and active remediation of environmental contamination.
- Promote environmental responsibility among our employees.
- Integrate environmental management systems methodology into our business and decision-making practices. This includes the measurement and reporting of our performance, and the practice of continuous improvement.
- Ensure our products and operations comply with applicable environmental regulations and requirements.
- Provide clear and accurate environmental information about our products, services and operations to customers, shareholders, employees, government agencies and the public.
- Inform suppliers of our environmental requirements and encourage them to adopt sound environmental management practices.
- Contribute constructively to public environmental policy

16 February 2000

After your program has been endorsed and introduced, it is crucial to establish methods to evaluate, maintain and institutionalize it.

1. Develop an Environmental Policy

Institutionalize the gains made in your recycling program by creating an environmental policy for the company (and even for specific departments). Most businesses successfully minimizing their environmental impact are guided by an environmental policy. The policy should describe the new practices you develop, the suppliers you use, and the employee policies that will permanently make your workplace a profitable, environmentally sound company.

A memo or official statement from your president or CEO describing your company's commitment to the environment will go a long way towards full acceptance of an environmental policy and the eventual incorporation of its goals and objectives into company culture. A presentation made by management on the content and importance of the company environmental policy is an especially effective means of achieving policy buy-in. Employees should be encouraged to participate and offer input on achieving the environmental goals, and company meetings should be used to introduce those employees who will have a special role in helping administer the environmental policy.

A corporate environmental policy can be a powerful tool for changing habits and corporate culture. And when included in new employee orientation, your company's environmental policy can help instill good workplace environmental habits right from the outset and set the stage for the development of new ideas that will help you cut waste and reduce costs.

2. Publicize Your Message and Results

Your customers, suppliers, stockholders, employees, and community will want to know about your environmental achievements and future goals. Once your policy(s) are completed it's a good idea to publicize them through customer information packets, vendor contracts, stockholder meetings or updates, and employee bulletin boards. If desired,

you can even send a press release stating your company's new environmental practices, success stories, and/or visions to a local newspaper. The amount of recycling accomplished can be translated into the amount of natural resources saved. Employees can take pride in such accomplishments and it's good public relations.

3. Follow Up, Evaluate, and Fine-tune

Too many great programs are implemented and quickly forgotten a year later. This is why top management must authorize and support your team. You must have the resources and time to meet regularly and maintain progress on your waste management programs. In addition, touring a company with a facility manager or environmental coordinator can be tremendously helpful in identifying recycling problems. Indeed, signs become outdated, bins get lost, or an office restructuring may have neglected updating the recycling program. Regular "recycling checks" should be scheduled at least twice a year. Also, ask for and encourage ideas by using a survey for employees on recycling - this in itself will heighten awareness and will provide feedback on improving the program. A sample survey is found in the Appendix of this manual.

It is helpful to publicize the amount of natural resources saved through recycling along with the volume of material collected. Employees are more likely to act if they know their behavior clearly makes a difference. Include this information on the company's web site and in employee newsletters or emails.

New employee orientation must include information on your recycling program. The efficiency and cost effectiveness of a recycling program can be jeopardized by new employees who are not trained in the proper recycling protocol. Lack of training can result in contamination problems, which can render an entire load of recycled material unfit for marketing. During orientation a Green Team volunteer or the Environmental Coordinator should give a presentation outlining the recycling program and stressing your company's commitment to the environment. Likewise, the site tour should include recycling areas and other details about the program. A sample memo to new employees can be found in the Appendix to this guide. A sample recycling "Welcome Memo" for new employees can be found in the Appendix to this guide.

Other ways to maintain a recycling and waste reduction program include:

- Record the starting date for every new idea you implement. Schedule follow-up dates, usually in increments of two to three months, for the first year or two to evaluate your progress towards your goals.
- Start an eco-column in your company newsletter, bulletin board, or email to include interesting waste-related information (inside your company and out!) on a regular basis.
- Create an employee and/or department incentive program. Employees and departments who do green "deeds" can be rewarded with coupons, gift certificates, bus passes, etc.
- Develop regular reports to upper management on the company's environmental progress and successes. Publicize these reports to all employees.
- Have the Green Team schedule inter-departmental meetings to brainstorm ways to improve the program.
- Give presentations at all-company meetings - person to person communication is the most effective tool for changing behavior.
- Keep bins, signage and pamphlets professional-looking, clean and updated.
- Messages need to be repetitive.
- Encourage "recycler" role models, especially from top management.
- Recognize employees' recycling efforts in front of others.

What it Takes to Have a Successful Recycling Program:

The success of a business recycling program is dependent upon employee involvement. The interview below with Rose Crescenz, Green Team Leader at NetLibrary in Boulder, Colorado, sheds insight into how a recycling program can meet the expectations of both management and employees at a medium sized company. This interview provides information on feedback mechanisms and employee involvement activities that can meet the needs of all employees who choose to recycle.



Rose Crescenz (far right) poses with the rest of the NetLibrary Green Team.

Q: What makes a good Green Team?

A: Lots of help! Having employees from many different departments helps us reach out far and wide to affect recycling. These people also serve as resources for other employees in their own departments. Also having a large Green Team helps morale and gives us better insight on problems. For instance, a worker in one department may not know the recycling needs of another, so having a representative from each department gives us better insight into what is really needed by everyone.

Q: Which departments need to give you “buy in” to go ahead with your recycling activities?

A: Facilities, Human Resources and, of course, it helps to have the CEO support what we are doing since he or she sets the tone for others. Having a quote from the CEO that you can use in recycling material helps give the recycling program credibility.

Q: Why is it so important to get Facilities and Human Resources involved?

A: Facilities serves as our interface with the cleaning crew. If the cleaning crew isn't well informed then all our efforts to recycle are fruitless. They can also help us decide where to place bins and make recommendations for labeling. They help us figure out the logistics of the recycling program. Human Resources is instrumental in our communicating the recycling message to employees through company meetings, newsletters and employee packets. They also help with our survey distribution.

An Interview with a Green Team Leader

Q: Can you give an example of something the Facilities Department recommended that the Green Team did not think of?

A: Yes, they advised us to get recycling signs in Spanish for the cleaning crew.

Q: What works well at motivating others to recycle?

A: Setting an example. It can be contagious if even just a small group starts recycling. Avoid lecturing or making people feel bad for not recycling. Don't make recycling mandatory either. It should be a choice and people should feel good about doing it. We make people feel good by telling them how many trees and other resources they save through recycling. That really seems to help.

Q: Anything else?

A: Yes, keeping the program visible through outreach is key. We post recycling flyers, write articles in the newsletter and make sure recycling is addressed at employee meetings. Keeping it in front of employees provides a constant reminder.

Q: What helps keep continuity in the program?

A: Regular meetings help keep us focused and motivated to keep coming up with ideas. So does giving people small tasks to research and report back on.

Q: What would help sustain your recycling program better?

A: Having a staff position where recycling coordination is part of one's job would help tremendously. This would ensure accountability and continuity in the program.

Q: What can management do to promote the Green Team?

A: Management can tell employees it's okay to take the time to recycle. Some people feel they shouldn't take time to help with the recycling or attend meetings of the Green Team during working hours - that's too bad because they are serving an important function for the company. So it would be helpful to have management state publicly to its employees that it considers recycling a part of normal business hour work.

Q: What general advice do you have for other companies starting a recycling program?

A: Perseverance and outreach is key. Employees want to recycle - you just need to make it easy to do so.

Meeting the Needs of Different-Sized Companies

THE SMALL COMPANY PERSPECTIVE (FEWER THAN 50 EMPLOYEES)



Small companies can implement a successful recycling program with high participation more quickly than larger companies. They can also respond faster to changes in the recycling program, particularly if management is supportive. They can implement many of the same waste reduction measures (see Cutting Waste at the Source) as medium or large businesses and also reap cost savings from these activities. Consider the following:

- Volunteer Green Team employee(s) can implement and maintain the recycling program without having a paid, designated staff position. This team should have at least four employees actively participating.
- Contracting with a recycling company for hauling recyclables is optional as volumes may be so small that employees can take turns bringing the collected material to a recycle center.
- Small companies that are tenants in a building may need to negotiate with the landlord and other tenants about creating or improving a recycling collection program for the building.
- Recycling program announcements can be made at staff meetings and via email.
- Bins can be obtained at department stores or business supply stores.
- Feedback to employees can be done effectively face-to-face or at staff meetings.
- Employee involvement in recycling activities can be significant if management participates, thereby creating a visible and important role model.

THE MEDIUM COMPANY PERSPECTIVE (50 - 500 EMPLOYEES)



Medium sized companies need more recycling coordination than small companies and thus benefit greatly from having a designated Environmental Coordinator to work with a Green Team to implement recycling and waste reduction measures. Green Teams can have an enormous impact by

influencing co-workers to recycle and are well-informed of their needs to make a recycling program work. Medium-sized businesses should also consider:

- A recycling company is needed to collect recyclables.
- Major departments must be involved on the Green Team.
- Recycling program announcements can be made through email, company newsletters and at company meetings.
- Bins can be obtained through catalogs that offer reduced pricing for volume orders.
- Large quantities of recyclables, such as white paper, can garner a payback to the company. Companies should check with their recycler about these kick-backs.
- Creating a recognizable logo for the recycling program can help in building participation.

THE LARGE COMPANY PERSPECTIVE (OVER 500 EMPLOYEES)

A large company cannot institute recycling program changes as fast as a smaller company; indeed, significant improvements in volumes of material recycled could take months, if not years. Consider:

- Professional waste audits can provide valuable information on ways to cut waste and save money.
- New building designs should include recycling closets, storage and warehouse space for recyclables, and space for recycling compactors and roll-offs. Also, individual offices and cafeterias should have built-in recycling areas.
- Creating a recognizable logo for a recycling program can be helpful in building participation.
- With such large volumes of recyclables produced, compacting and baling machinery may be necessary.
- Large companies can greatly benefit natural resource conservation due to the sheer volume of recycled material collected. It is good public relations and gives employees pride in their company if the amount of natural resources saved can be publicized.
- There are huge differences in needs between buildings, departments and manufacturing facilities.
- Your recycling company must be capable of providing compactors, gaylords and hundreds of individual recycling bins, and able to haul large volumes of material.
- Hard to recycle items like pallets, light bulbs and batteries can be collected and recycled with companies that specialize in large volumes of these materials. Big companies should consider creating an entire department devoted to: 1) diverting discards from the waste stream by returning packaging back to manufacturers who can reuse it, 2) preparing hard to recycle items for shipment to specialized recyclers and 3) building relationships with schools and charities for donating reusable items.
- Recycling program announcements can be made through email, company newsletters and by managers at departmental meetings.

- Bins can be obtained through catalogs that offer reduced pricing for volume orders. Bin signage may need to be bilingual.



- For Corrugated Cardboard, a baler or compactor will be needed depending on dock space and labor availability. A compactor is ideal but takes up valuable dock space. If a company goes with a baler, they should produce size specific bales to cut out the processing fee. Also the company should find out how many bales a recycler can pick up at a time to minimize transportation fees. Storage of bales will also need to be taken into consideration. Ideally, carts that are specific to the collection of cardboard should be used.
- Creating more specific recycling categories, such as "white paper only" or "aluminum only" can bring additional revenues from the sale of recyclables.

A Note About Shredding

Shredding more paper than necessary can be costly and it unnecessarily degrades the recyclability of paper. Employees that over-use shredding collection bins for non-confidential paperwork are driving up company expenses while promoting a process that destroys paper fibers that could otherwise be recycled into new paper.

The Environmental Coordinator

An Environmental Coordinator (EC) is needed to oversee the recycling and waste reduction program at a large business. The EC works along with a Green Team of volunteer employees to advise him/her. The Green Team can also identify community needs for surplus equipment and supplies. The team is responsible for ensuring employee participation via newsletters, memos, flyers, email and through announcements at staff meetings. As for achieving goals, it is wise to focus initially on small and incremental goals to win the support of management then tackle more ambitious recycling and waste reduction projects. Other EC tasks include:

- Meets with the recycling company and the Environmental Services Director to work out a site-specific plan for collection and transportation of recyclables.
- Works with the Production Manager to create a comprehensive plan to eliminate waste from production. Identify possible reuse of packaging. Work with floor managers in identifying areas for waste reduction.
- Creates a recycling infrastructure of deskside containers, copycenter containers, and break room containers.
- Works with the Food Service Director to identify ways of waste reduction. Proper placement of recycling containers in the cafeteria is key. Consider the use of reusable tableware.
- Works with Purchasing Director to address waste reduction and “buying recycled.”
- Attends regularly scheduled purchasing meetings, which are held with other departments to promote buying recycled products.
- Contacts distributors and manufacturers about eliminating unnecessary packaging.
- Meets with Department Heads to map out intent of program and responsibility of each administrator.
- Meets with employees about implementation of waste reduction program.
- Works with Environmental Services to educate their staff.
- Works with Personnel Department to have waste reduction efforts included as part of new employee orientation.
- Works with mailroom to identify ways to eliminate employees from mailing lists. Work toward recycling or eliminating “junk mail.”
- Works with public relations to publicize “green” activities by company.
- Works with a Green Team to monitor and report on waste reduction efforts. Green team should be chosen to represent different departments or buildings. EC leads a monthly meeting of the Green Team.
- Is responsible for continued participation and maintenance of collection infrastructure.
- Addresses employees at orientation sessions, writes newsletter articles on recycling and waste reduction tips, researches outlets for hard to recycle items, and explores options for waste avoidance (ie: source reduction).

Colorado Companies with Environmental Coordinators:

IBM

Boulder
Community
Hospital

Agilent

Hunter Douglas

Amgen

Anheuser-Busch

Cutting Waste at the Source: Precycling

Any activity that reduces, avoids or eliminates waste before it is created is known as “precycling” or “source reduction.” The focus is on preventing the generation of waste as opposed to controlling, treating or managing waste after it already exists. Some waste may be unavoidable. However, when you do manage to avoid waste, you can save money in three ways:

- 1) By not paying for the materials that are wasted
- 2) By not paying to handle the material
- 3) By avoiding disposal costs

No matter what the nature or size of your business, you can find ways to reduce waste from any of the following areas: customer service, marketing, distribution, food services, maintenance, office operations and manufacturing.

The following checklist will assist you with your source reduction activities.

Paper/Office Supplies

- Establish a company-wide double-sided copying policy; be sure future copiers purchased by your company have double-sided capability, and train employees to use this feature.
- Reuse envelopes or use two-way (“send-n-return”) envelopes.
- Keep mailing lists current to avoid duplication. Ask to be removed from unwanted mailing lists.
- Route, post, or E-mail company or department memos instead of making individual copies.
- Edit documents on the screen before printing.
- Use outdated letterhead for in-house memos.
- Use central files to reduce the number of hard copies your company retains.
- Make scratch pads from used paper.
- Use postcards when appropriate to save paper, envelopes, and postage.
- Reuse one-sided paper for drafts in copiers/printers or make into notepads.
- Eliminate unnecessary forms and redesign to use less paper.
- Use refillable pens.
- Use a transmittal stamp or a small fax sticky note instead of a separate cover sheet for faxes.
- Design mailers which avoid the use of an envelope.
- Reuse file folders, interoffice envelopes, ring binders, paper clips, and rubber bands.
- Use smaller typeface, margins, single spacing, and rigorous editing to keep documents small.
- Use half-sized sheets when possible.
- Save documents on disk instead of making hard copies.
- Purchase fewer subscriptions to magazines and circulate among employees.
- Donate old magazines to hospitals, clinics, or nursing homes.
- Analyze and re-format common reports to reduce paper usage.
- Use plastic window pins for name tags. The sleeve can be reused and the inserted paper can be recycled.
- Encourage meeting attendees to return their name tag by placing designated boxes at room exits.
- Put letterhead templates on the computer to avoid errors on printing to letterhead.
- Use undated, erasable marker boards or chalk boards.

The average office worker throws away at least one-half pound of high grade recyclable white paper each day

Packaging

- Order merchandise in bulk.
- Work with suppliers to minimize the packaging used to protect their products.
- Minimize the packaging used for your products. (Don't rely on the people selling you the package to design the minimum content package for you. Their interests are in selling you more, not less product.)
- Use reusable and/or recyclable containers for shipping your products; request the same from your suppliers.
- Shred newspapers and reuse for packing.
- Reuse foam packing peanuts, "bubblewrap," and cardboard boxes, or donate to another department or organization.
- Repair and reuse pallets or return them to your supplier.
- Make packages easier to recycle by redesigning them so they'll consist of a single material. If this isn't feasible, design for materials that can be easily separated.
- Find out if the packaging contains inks, dyes, or tints which can be removed to enhance recyclability.
- Require vendors to ship using only materials which are easily reused or that can be recycled through your company's recycling program.
- Ask vendors to take back packaging. In some cases they may be able to reuse it. If not, use their packaging materials for your outgoing product packaging.

Food-related Waste

- Buy bulk condiments, creamer, etc. and refill serving dispensers.
- Use reusable dishware, utensils, mugs, etc. for employee cafeterias and break rooms.
- For catered meetings, select a caterer who practices waste reduction.
- When feasible, select a menu that eliminates the need for serviceware.
- When serviceware is used, use reusables not disposables.
- Compost food waste and coffee grounds.
- If disposable cups are used, have everyone label their cup for reuse.
- Donate excess food to a local food bank or homeless shelter.
- Buy company mugs; stop providing disposable cups.
- Use permanent, washable coffee filters or unbleached disposable filters which can be composted.
- Reuse trash can liners or eliminate where possible.
- Use cloth roll towels or air hand dryers in restrooms rather than paper towels.
- Encourage employees to bring lunch to work in reusable containers with durable flatware and cloth napkins.
- Offer smaller food portions in your cafeteria to prevent waste.
- Avoid the tremendous waste of boxed lunches by serving buffet style.
- Use cloth towels, table covers, napkins, and handtowels if acceptable in your operation.

Reuse

- Reuse drums for internal storage and transportation of materials.
- Sell or give surplus property to employees, a local charity, or a waste exchange.
- Advertise surplus and reusable waste items through a local materials exchange.
- Set up an area in your business for employees to exchange used items.
- Buy rechargeable batteries for your equipment.
- Reuse incoming packaging for shipping your products.
- Use incoming bags and boxes as containers for your customers to use.

Landscaping

- Use a mulching mower or retrofit your mower and leave grass clippings on the lawn.
- Compost grass clippings and leaves or ask your landscaper to send trimmings to a composting facility.
- Choose a landscape design and plants, trees and grasses that require low maintenance, generate little waste, and utilize minimal water (i.e. xeriscaping).
- Use permanent plantings for landscaping.
- Install water sensors on the automatic watering system to avoid the “watering in the rain” phenomenon.
- Plant trees strategically to help minimize summer cooling needs.
- Return plant containers to vendors.
- Avoid overfertilizing and overwatering, which lead to thatch buildup and excess lawn clippings.

Manufacturing

- Produce/purchase goods in fewer models or styles, reducing the overall lines, options, and associated packaging and wastes generated for each.
- Purchase longer-lived and energy efficient manufacturing equipment.
- Reduce the number of parts. Design for recyclability of components and reduce options.
- Use bulk line lubes, chain lubes, sanitizers, etc. in process whenever possible.
- Reduce or eliminate toxic components of product, process, and packaging whenever possible.
- Rent, borrow, or lease capital equipment not frequently used.
- Implement preventative and predictable maintenance programs to improve efficiency and to eliminate downtime.
- Work to improve supplier quality of raw materials and components to reduce waste.
- Produce and purchase in bulk containers.
- Use and package in concentrate.
- Purchase products with multi-functions (e.g. one type of cleaner instead of three).

Employee Involvement

- Initiate an employee suggestion program; reward and publicize good suggestions on how to reduce or reuse waste.
- Develop an organization-wide waste reduction awareness program.
- Conduct contests with departments or branches to see who can manage waste the best.
- Reward employees for their involvement.
- Sell surplus items to employees or donate to their favorite charities.
- Solicit employee input from every level/unit within your business. The best ideas can come from workers who are intimately involved in day-to-day practices.
- Once your employees get involved, they will spread the word to your customers and suppliers. Encourage employees to communicate your company's efforts to those you do business with.
- Get involved with the community; adopt a road to clean up, hold a ‘recycling drive,’ or sponsor local events.
- Allocate waste costs to each department to motivate waste prevention.
- Solicit employee involvement in evaluating and monitoring your program on a regular basis.

Junk Mail: A Waste of Time and Resources

Junk mail is not only a huge waste of resources, it creates a direct financial drain on your business. For every 1/2 hour per day your office staff collectively spends opening, sorting, and disposing of unwanted mail, your business may spend a minimum of \$1500 per year in employee wages and overhead! Add lost productivity and waste disposal and/or recycling costs, and you'll undoubtedly find it highly cost-effective to implement some or all of the following anti-junk mail techniques in the workplace.

It may be most efficient to appoint one person in each department to collect all the junk mail (including mail for former employees) for that department for a year. Every two months, the appointee can categorize the mail by sender and get names removed from lists as described below. If individual departments cannot handle the responsibility, perhaps administrative support staff can.

Follow these basic steps until unwanted employee mail disappears. Be patient, though, it could take up to six months before you start seeing results. And because mega-mailing houses continuously gather, sell, and rent names, you may have to make de-junking your office mail box an annual ritual.

TWELVE WAYS TO REDUCE JUNK MAIL

1. If the item was sent by first class mail or pre-sorted first class mail, write "refused, return to sender" on the unopened mail and mail it. If it was sent by bulk mail, **DO NOT** write this on the mail because the post office will not return it to the sender unless it has "address correction requested" or "return postage guaranteed" written somewhere on the envelope.
2. Use business reply envelopes with a note requesting that your name be removed from their lists.
3. Call toll free numbers listed on unwanted mail and ask to be taken off their list.
4. Cancel unwanted subscriptions.
5. If you order from catalogs, call their toll-free number to be taken off their list.
6. When requesting a catalog or ordering for the first time, specify not to sell, rent, or trade your name to any other company.
7. If you only contribute once per year to a charitable organization, ask them to only send you a request once per year.
8. When filling out any forms requiring your name and address, confirm they won't sell your name to mailing lists.
9. Call the company that sent the junk mail for instructions on removing names from their mailing lists.
10. If a phone number cannot be found, return the label portion of the mail in a new envelope to their address (some businesses must see the label). Include a note with the removal request.
11. Don't fill out the warranty cards from new products unless it expressly states that your warranty is void if you don't. Most of the time you are covered by the manufacturer's warranty whether you send in the card or not as long as you have your receipt. These cards are usually used simply to get your name on mailing lists.
12. Watch out for "contests" or "free offers." Generally their purpose is to sell you something or to get your name on lists.

WHO TO CONTACT TO GET OFF BUSINESS MAILING LISTS

Call or write a letter to the following list brokers to remove your company from their lists.

Dun & Bradstreet

Customer Service
899 Eaton Ave.
Bethlehem, PA 18025
Tel. 800-999-3867

Equifax - R.L. Polk

Attn: Name Deletion File
List Compilation and Development
6400 Monroe Boulevard
Taylor, MI 48180-1814
Tel. 800-873-7655

Direct Marketing Association

Mail Preference Service
P.O. Box 9008
Farmingdale, NY 11735-9008
Tel. 212-768-7277

Consumer Opt-Out

P.O. Box 919
Allen, TX 75002
Tel. 800-353-0809

HOW TO GET OFF NATIONAL PHONE SOLICITATION LISTS

Telephone Preference Service

DMA
P.O. Box 9014
Farmingdale, NY 11735-9014
Send in your name and telephone number including area code.

HOW TO STOP SOME OF YOUR JUNK E-MAIL

E-mail your Internet address to Direct Marketing Association at <http://www.dml.com>.



The average American spends eight full months of his/her life opening junk mail!

INTRODUCTION

This section of the manual is intended for new companies or non-profit organizations desiring to offer recycle services to small, medium and large commercial customers. It is also intended for waste service companies seeking to expand their business to include recycle services.

The commercial sector for recycle service includes apartments (with more units than are served by residential collection), office buildings, hotels and motels, schools and hospitals, small retail stores, restaurants, large supermarkets, department stores and big box retail outlets — built singly or combined in a mall or office park. Commercial recycling service entails the collection of materials from recycling containers located at the customer's site. Service for



Recycling can encompass many different commodities, including containers, such as glass, plastic and aluminum bottles and cans, as well as papers, such as office paper, corrugated cardboard and newspapers.

large-business customers includes lifting a compacting drop box onto a tilt body roll-off vehicle. After the truck is full and goes off-route to unload, the service includes either sorting and densifying the truck load at a processing or transfer facility, or directly marketing the material to a broker or a manufacturer for end-marketing. Commercial service does not include the collection of recyclables from households or small apartment buildings, nor roll-off collection of debris.

Recycling services entail two different operations which have very distinct elements, but which have to be successfully integrated in order to work together efficiently. The two elements are collection and processing — or transferring and marketing.

In addition, the market for recycling services is already occupied in many territories by integrated waste management companies which have three built-in advantages that must be confronted by a newcomer to recycling. Among them are name brand identification, the ability to dominate bids that are specified for combined waste/recycling services, and the capacity to internalize the benefits from diversion that flow back to the waste side of the business due to avoided landfill fees and avoided waste fleet costs (all of which will be explained in detail later). In addition, some allege that they use their market power to engage in anti-competitive activity. A strategy is essential to meet these challenges.

This section of the manual is divided into three parts:

- Collections
- Processing and Marketing
- Bidding

Although these items are discussed separately for organizational reasons, to succeed it is necessary to synthesize each of them into one coherent whole rather than read them in isolation. Begin with understanding your local competition, the types of commercial establishments in your town, the regional markets for recycled material and the nearby facilities where you can sort and densify them for shipping. From there, it is relatively simple to figure out what kind of vehicles and associated containers will work best for the materials you collect.

A Best Practices User's Guide

COLLECTIONS

Collection represents the dominant portion of total recycling service costs, and for that reason it is critical that a new company entering this market fully understands the details of how collection equipment and systems work.

Minimum Fleet Size

In theory, it is possible to enter the market for containerized commercial front or rear end loader collection with just one truck. Depending on the type and age of the vehicle, a truck may cost between \$50,000 - \$160,000. However, there are two reasons why entry with more than one vehicle is important as a practical matter.



Depending on the type and age of the vehicle, a truck may cost between \$50,000 - \$160,000.

Backup Vehicle

Waste or recycling collection service for commercial customers is time-critical. Once the customers' containers are full, the customer demands the service provider be on-site to empty them. For the recycling company, as with a waste company, this means a high level of reliability is an essential part of being a credible service provider. Standard operational experience in the industry indicates that for every four to six collection vehicles used to drive the routes (depending upon the age of the fleet and how well it is maintained), an extra truck is necessary as a back-up vehicle for emergencies. The truck serving as back-up can be a used vehicle that will cost

approximately half the price of a new one. In the start-up phase of developing a new business, it might be possible to temporarily make due with just two primary trucks. In that case, were one to break down, the other could be used on a second shift, assuming your locality does not limit the hours of collection in a way that would preclude completing the broken-down truck's normal route with the single remaining functional vehicle at night. Operating with just one vehicle would be marginal at best.

Scale Efficiencies

There are also scale economies in collection at the local level. In waste or recycling collection, a ten vehicle fleet that might service 2,000 - 3,000 commercial customers will be necessary to fully utilize a maintenance operator, swing driver and sales representative. This is the critical back-room function of a smoothly running collection operation. Sweat equity or other improvised arrangements will be necessary until you reach that size (otherwise your employees will not be efficiently utilized).

Cubic Yard

You will hear a good deal about cubic yards in this User's Guide. A cubic yard is the standard unit of measurement in collection. It is a volumetric measure, three feet on each side of a cube. It is not the same as a pound or a ton which is a measure of weight most often used to levy fees at a transfer station or landfill when unloading (except in the atypical case where the facility does not have a truck scale), and, in collection, in defining when a vehicle is overweight.

Miscellaneous Conversions

- 1 Cubic Yard = 220 gallons = four 55 gallon drums = 3.6-60 gallon toters = 2.4-90 gallon toters
- 1 Cubic Yard = 250 pounds residential waste = 125 pounds commercial waste
- 1 Cubic Yard = 150 pounds commingled containers = 400 pounds of old newspapers = 50 pounds of old corrugated cardboard = 300 pounds of sorted office paper

Truck Equipment

It is important to pick the type of truck that will work for the number of customers and the types of materials that are included in the recycling program.

In the past, recyclables were often collected in manually-loading, open-top, non-packing trucks with divider walls to separate the different materials which had been source-separated by the customer. This highly labor-intensive phase of recycling's development is no longer competitive as the need for efficiency has displaced initial enthusiasms for employing the hauler that accepted the most types of materials.

Also the frequent need to haul long distances in Colorado outside Denver increases the need for compaction. The longer the distance to off-load the collected material, the more imperative the need to compact in order to maximize the payload. Compacted waste loads can carry 20,000 pounds: uncompacted mixed recyclables, 5,000 pounds. Trash trucks will utilize push plates and packing rams that produce compaction ratios as high as 10:1, but to minimize glass breakage, specialized recycle packers will only compact 1 1/2:1 to 2:1. If your marketing plan does not lead you to include glass bottles in the materials which you collect, you could consider a vehicle with packing ratios more common for garbage collection, thereby dramatically improving your truck payloads.

Lastly, the combination of workers' compensation rates, sick time for injuries, and OSHA regulations are increasingly pushing the industry to reduce lifting by implementing automation equipment to tip totes and carts.

For all of these reasons, compaction and semi- or full-automation are now increasingly the rule in the waste and recycling collection business. There is, however, a downside to these enhancements that must be factored into your plan of operation. These systems have multiplied the hydraulic systems on the units. In addition to normal wear and tear, in real world conditions, truck operators will often pop the pusher blade or lift ram to dislodge a jammed load. This can cause over-pressurization and hydraulic failure. It is absolutely essential to plan a consistent preventive maintenance schedule and prepare back-up contingencies for unexpected vehicle downtimes.

The following is a description of the major types of collection vehicles used to collect commercial recycling loads.

Front-end Loader

A front-end loader is a waste or recycling collection vehicle that uses hydraulically activated forks attached in the forward position of the unit to lift a 2 to 10 cubic yard cart over the cab and tip the contents into a loading bay at the front of the compacting unit. Applied to the collection of a two or three stream system for recyclables (or as discussed below in a "one-pass" mode), the compacting unit will be split along the length of the box either top-to-bottom or side-to-side. When the cart is located at the customer's site, the vehicle can operate in its fully automated mode if the container at the site is accessible. Otherwise the operator will have to manually open the cage and/or move the container into a position where it can be lifted before returning to the cab to operate the automatic controls. Where collection is done with 60 to 90 gallon totes instead of carts (typically for recyclables set out by small businesses), a 6 to 8 yard specially-configured cart equipped with lift dumpers (or flippers) to tip totes, can be carried on the forks from stop to stop. Totes are wheeled to the front of the cart and the recyclables are dropped inside. Front end loaders, fitted with a dual side, low entry, cost approximately \$150,000. Their extensive electronic and hydraulic mechanisms limit their use to haulers with in-house specialized maintenance crews.

One Pass

When a front-end loader is split longitudinally to collect two streams separately and is paired with a similarly split cart that, when tipped, will drop the appropriate stream into the correct hopper, it is called a one pass collection vehicle. Except for the split load arrangement, it otherwise has the same characteristics as the front-end loader. They cost approximately \$155,000.

Cautionary Note:

Two-stream collection vehicles have originally been designed with the residential, not the commercial, sector in mind. The reason for this is two-fold. First, the collection split, whether it is a fiber-container split or a recyclables-refuse split, is much more variable in the commercial sector. This variability causes inefficient truck utilization when one compartment tops out while the other is only partially full. Second, fully automated two-stream collection vehicles require specially designed split collection totes or carts to ensure that material enters the correct compartment. These totes and carts create efficiency problems at businesses because the containers must all have the same split design, while the businesses may vary widely in their generation of recyclables versus refuse. For example, one business may have 80% recyclables and 20% refuse while the next business has 20% recyclables and 80% refuse. In addition, different businesses use widely different sized containers. The automated two-stream collection vehicles used on residential routes would require that both of these businesses use the same cart design with the same split between recyclables and refuse. An average standard split will create significant empty space in the carts set out at each business. These problems are less of an issue in residential collection because each household generates a very small portion of the material streams collected. The average split between recyclables and refuse across a large number of households is less variable than across a small number of businesses.

Rear Loader

A rear-end loader is a compacting vehicle that uses winches to tilt a 2 to 10 yard cart into a loading hopper at the rear of the unit. The rear sill of the hopper can also be configured with lift dumpers to tip 60 or 90 gallon totes used for recyclables and wheeled manually into place. The rear-loader can be split longitudinally, side to side, to separate different streams. They cost approximately \$95,000.

Side Loader

A side loader is a compacting vehicle that uses lift dumpers to tip 60 to 90 gallon totes into loading troughs that, in turn, are hydraulically raised up the side of the unit and tip over the top into front positioned loading hoppers. Typically, these vehicles are longitudinally split to separate two streams either top-to-bottom or side-to-side. They cannot load carts, however. They cost approximately \$130,000.

Tilt Body

Tilt bodies are used to lift a 20 to 30 yard drop box or compactor left at a large customer's site onto the vehicle. These containers are then taken away, unloaded and returned empty to the customer. Tilt bodies cost approximately \$90,000.

The following table summarizes the salient attributes of each recycle collection vehicle used for commercial customers from the foregoing descriptions.

Summary of Commercial Recycle Collection Vehicles					
Type of Vehicle	Purchase Cost	Split Stream Capability	Customer Size		
			Small	Medium	Large
Front End Loader	\$150,000	Yes	Yes	Yes	No
One Pass	\$155,000	Yes	Yes	Yes	No
Rear Loader	\$95,000	Yes	Yes	Yes	No
Side Loader	\$130,000	Yes	Yes	Yes	No
Tilt Body	\$90,000	n/a	n/a	n/a	Yes

There has recently been another innovation worth mentioning that provides the capability to more precisely bill (and credit) customers, and that is on-board weighing systems. These take two forms. One is located in the lift mechanism and is sufficiently accurate to be legal for trade, such as those made by Toter Incorporated. The other type measures the weight of the compacting unit that rests on the chassis itself, though these are not precise enough for billing. Vulcan and S.I. Technologies make these systems. Typically, on-board scaling can add approximately \$10,000 to the price of a collection vehicle.

In Colorado, there are a number of qualified equipment distributors to help you find the vehicle best suited to your needs. The vendors in the list to the right distribute some or all of the following collection vehicle types: semi-automated rear-load; semi-automated side-load; fully automated side-load; split body; and retrofit packages. This vendor list is provided for reference only, and does not imply endorsement of any product or vendor. National offices only are listed; call for contact information of local distributors.

Distributors of Collection Vehicles

Amrep, Inc.

1555 S. Cucamonga Avenue
Ontario, CA 91761
Tel: 909-923-0430
Fax: 909-923-2485

Crane Carrier Company

1925 North Sheridan Road
P.O. Box 582891
Tulsa, OK 74115
Tel: 918-836-1651
Fax: 918-832-7348
www.cranecarrier.com

The Heil Company

P.O. Box 8676
Chattanooga, TN 37414
Tel: 423-899-9100
Fax: 423-855-3478
www.heiltrailer.com

Leach Company

2737 Harrison Street
Oshkosh, WI 54903
Tel: 414-231-2770
Fax: 414-231-2712
www.leachusa.com

Lodal, Inc.

620 North Hooper
Kingsford, MI 49801
Tel: 906-779-1700
Fax: 906-779-1160
www.lodal.com

McClain E-Z Pack

P.O. Box 607
500 Sherman Street
Galion, OH 44833
www.mcclaingroup.com

Scranton Manufacturing Co., Inc.

101 State Street
P.O. Box 336
Scranton, IA 51462
Tel: 712-652-3396
Fax: 712-652-3399

Wayne Engineering Corporation

P.O. Box 648
Cedar Falls, IA 50613-0648
Tel: 319-266-1721
Fax: 319-266-8207
www.wayneeng.com

Wittke Waste Equipment

8416 N. 16th Place
Phoenix, AZ 85502
Tel: 602-371-0432
Fax: 602-678-6668
www.wittke.com

Fleet Routing

Careful routing is an important ingredient in an efficient hauling operation. While the subject can be complex, here is a list of major items to consider:

Proximity to Off-Loading Location

In a typical 8 to 9 hour day, approximately one hour is subtracted from the time available to collect recyclables for driving to and from the garage to the route and for lunches and breaks, leaving 7 to 8 potentially effective hours. From that, the time taken to go off-route and unload when the vehicle tops out and then to return to the route must also be subtracted. This may happen twice a day, and the longer it takes, the more time is lost from collecting customer's loads. A large hauler serves the entire city or metropolitan region, but a new entrant does not. Locate an area which is both fruitful for new haulers to ply and also close to the point where your truck will off-load.

Geo-Cluster

To a similar effect, the more your customers are clustered on the same streets and in the same neighborhoods, the less time will be wasted driving between stops. The following table illustrates how costs decline as the time between stops decreases with increasing route density.

Number of Routes

As you line up customers, you need to estimate the number of vehicles you will need to service them. In order to do this, first collect from your subscriber list while carefully timing [1] the time to and from the garage and route and on breaks, [2] how many stops on average can be made per hour while on the route, and [3] how many hours it takes for the truck to fill up. Use this data, along with your customer records on how many subscribers you have and how many times per week each has its cart pulled. Plug those numbers into the following formula.

Number of Routes=

$$\frac{\text{Number of Customers}}{(\text{Eff Hrs/Day}-\text{Hrs Offload/Day}) \times \text{Stops/Hr} \times \frac{5}{\text{Pulls/Customer/Wk}}}$$

If you offer both cart and compacter service, you will need to run separate calculations for each.

Route Design

Once you have lined up a set of customers and estimated the number of vehicles you need to pull their loads at the agreed upon schedule, you will need to draw the routes for each truck to follow. Good practice is to design a route that minimizes deadheading, makes right-hand turns and avoids the need for the operator to cross the street. Also, in heavily trafficked areas, schedule pickups for early in the morning or late at night when rush hour traffic is minimal.

Monthly Cost of Commercial Collection (Two Yard Container Twice Weekly)								
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
		Minutes Between Stop				Percent Difference		
		1	2	3	4	(4 to 1)	(4 to 2)	(4 to 3)
Minutes to Setup	5	\$93	\$100	\$116	\$124	-25.0%	-19.4%	-6.5%
	6	\$100	\$116	\$124	\$132	-24.2%	-12.1%	-6.1%
	7	\$116	\$124	\$132	\$139	-16.5%	-10.8%	-5.0%
	8	\$124	\$132	\$139	\$147	-15.6%	-10.2%	-5.4%

Specialized Runs

Depending upon your markets and the availability of central sorting facilities, you may need to off-load pre-sorted recycle streams in which, for example, corrugated cardboard is separate from mixed office paper on the truck or in different trucks or different runs of the same truck. It is quite common to have a special corrugated-only run to collect cardboard boxes from small retail shops that do not have sufficient volumes to justify a baler.

Customer Container

From your perspective, it is not only necessary to carefully evaluate the type of truck that will work best for your needs, but also the type of container that will both be appropriate for different types of customers and will also function well with the collection vehicle.

From the customer's perspective, because the amortized cost of a container is low relative to the costs of emptying it, attempt to upsize the container to the point where the number of pulls is limited to once per week. This is subject to the availability of space outside the customer's premises where the unit can be located in a place where your vehicle can access it.

Below are the different types of containers used for collection, keyed to the size of the customer.

Toters

For small customers, especially when many different types of materials are being collected that have to be kept separate, wheeled toters are most appropriate. These come in 60 or 90 gallon sizes with handles that couple together with the lift dumpers (or flippers) on collection vehicles which tip the toter's load into the vehicle's hopper. Typical prices for toters are \$45 to \$55 depending upon the quality ordered.

Carts

For medium-sized customers who generate 5 to 10 tons per month, carts (more commonly known as dumpsters) are used. These come in different sizes ranging from 2 cubic yards to 10 yards. When used in conjunction with front-end loaders, they will need to be fitted with side sleeves for the vehicle's lifting forks. Typical prices range from \$300 to \$1,000, depending upon size, strength and whether the lid is cantilevered or provided with a locking mechanism. Increasingly, metal reinforced plastic duty plastic carts are being fabricated, along with properly placed drain holes in order to minimize rust problems. Also,

customers which generate more than 5 tons of corrugated cardboard boxes per month, such as a medium-sized supermarket, should be encouraged to purchase a baler to reduce the number of pulls needed to handle their cardboard discards. A simple vertical downstroke baler can be purchased for \$1,000 and pay for itself in lower pull-costs in a year.



For small customers, especially when many different types of materials are being collected that have to be kept separate, wheeled toters are most appropriate.

Compactors

For large customers generating more than 10 tons per month, a drop box without packing or a compactor with 20 to 30 yard volumes is used. These are left on-site, and, when full, the containers themselves are lifted onto a tilt body truck and hauled back to the off-load point, tipped, and returned to the customer. A drop box typically costs \$1,000 to \$2,000, and a compactor, \$15,000 to \$20,000. To provide a receptacle for the customer while the box is off site being emptied, the customer will either need to have an empty box brought when the full one is removed, or a redundant box (or small temporary holding bin) must be left on site.

The following distributors in Colorado are available to help you acquire the necessary containers for your customers.

Distributors for Customer Containers in Colorado

Wastequip, Inc.

5400 Marshall St
Arvada, CO 80002
1-800-292-7968
Contact Walt von Duhn

OTTO Industries, Inc

12700 General Drive
Charlotte, NC 28273
Contact (in CO) Scott Deborski
303-926-0440

Amer. Transportation & Equip.

2555 W Evans Ave
Denver, CO 80219
303-287-3636
Contact Pat McGrann

TOTER, Inc

841 Meacham Road
Statesville, NC 28687
Contact (in CO) Jim Austin
303-371-8600

Busch Systems International

130 Saunders Road - Unit #7
Barrie, Ontario, Canada L4M 6E7
Contact (in CO) Stephanie MacMillan
800-565-9931

Techna-Flo Inc

PO Box 3479
Englewood, CO 80155
303-699-9844
Contact Bill Haskins

Consoldated Plastic Company

8181 Darrow Road
Twinsburg, OH 44087
800-362-1000

The Hiebert Company

7100 Broadway, Bldg 6-B
Denver, CO 80211
303-429-1973
email: jglissmann@aol.com
Contact Eric Glissman

Americana Resource Technologies

PO Box 1731
Sterling, CO 80751
800-889-3226
Contact Dennis Williams

Fibrex Products

3734 Cook Blvd
Chesapeake, VA 23323
Contact (in CO) Ruben Leenders
800-346-4458 Ext.17

UltraCart

6484 Buffalo Road
Harborcreek, PA 16421
Contact (in CO) Charles Morgan
814-899-0382

Pro-Tainer Inc.

P.O. Box 427
Alexandria, MN 56308
Contact (in CO) Mary McAloney
800-248-7761

Eco-Products

3655 Frontier Ave
Boulder CO 80301
303-449-1876

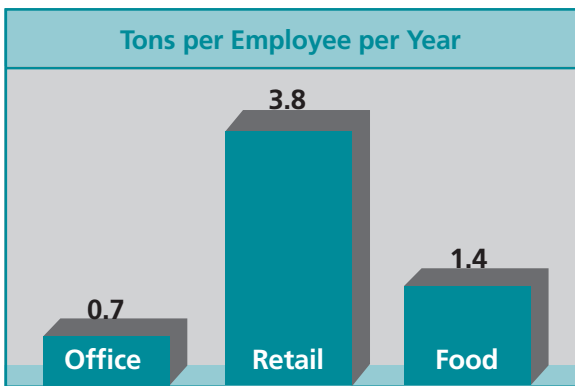
PROCESSING AND MARKETING

To determine which materials to include in the recycle service you offer, you need to evaluate what items are generated by prospective clients, what facilities are available locally to sort and densify loads off your trucks to prepare them for market, and what markets are available to buy those materials.

Material Generated

Recycling can encompass many different commodities, including containers, such as glass, plastic and aluminum bottles and cans, as well as papers, such as office paper, corrugated cardboard and newspapers. Different types of commercial businesses, in turn, are characterized by different total quantities of waste generation per employee, as well as by different components of their discard stream.

As an index of the kinds of recycle generation you might expect to see by type of business, the graph below shows the total tons of discards per employee by business sector.



Source: Brown University Center for Environmental Studies



To determine which materials to include in the recycle service you offer, you need to evaluate what items are generated by prospective clients.

Source: SCS Engineers

	Office	Wholesale/ Retail	Food/ Entertainment	Service	Total Commercial
Newspaper	6.8	3.0	4.9	4.0	4.8
Corrugated	8.3	19.1	10.5	11.4	11.3
High Grade	3.2	0.5	3.6	2.7	3.3
Mixed Office	26.7	4.9	8.9	13.6	12.6
Plastic	0.2	0.1	0.2	1.6	0.2
Metal	0.7	0.5	0.7	0.7	0.7
Glass	2.9	1.5	1.1	1.4	1.4

The table above shows the distribution of these types of recyclables among the different classification of commercial customers.

The ideal situation would be to provide a full service recycle company that offers collection of all potential recyclables. However, though admirable, it may be too costly to provide this level of service to many customers. For one thing, there are so few containers in the bulk of the commercial sector, restaurants and bars excepted, that it is difficult to set up handling systems to collect and process them economically. For another, Colorado has few facilities available to commercial haulers for sorting and densifying a full spectrum of recyclables.



General material recovery facilities (MRFs) or specialized paper processors that sort and densify mixed, lightly packed loads may not be available in your area.

Sorting and Densifying Facilities

General material recovery facilities (MRFs) or specialized paper processors that sort and densify mixed, lightly packed loads may not be available in your area. Also, even if they are, the plant might be owned by a competitor who refuses to offer you competitive rates for using his or her facility.

If either situation exists, you will be forced to evaluate how to get your loads directly to market. This may mean that, to a certain extent, you may only be able to collect the number of materials that you can keep separate on the truck, because post-collection sorting is not an option. Understanding your markets is key to making the final decision.

Even if a sort line is available at competitive rates, it might be more profitable to go direct with your trucks (on which some bare bones separation has been done) to end markets equipped to handle mixed, lightly packed loads. All options should be priced out to determine which will let you set rates for your service that are low enough to attract the number of customers you need to stay in business.

Markets

Regardless of the decision you make about what materials to collect, the profitability of your enterprise will rise or fall with the office paper and corrugated cardboard fraction, which is the largest part of the waste stream and has the strongest markets. These two grades could be collected separately, ready for direct marketing, on a split body recycle compacting unit.

In order to help you understand the different grades that lie within the fiber fraction and which to pursue, the following chart shows how the markets define each grade. Along side the definitions, the relative value of each grade over the long term is shown when Mixed Office Paper is set at 100.

Recovered Paper Grade Definitions

Grade	Description	Prohibitive	Out Throws	Price Relation scale to 100
Sorted White Ledger	Printed or unprinted sheets, shavings, guillotined books, quire waste and cutting of white sulfite or sulphate ledger, bond, writing paper, and all other papers which have a similar fiber and filler content. This grade must be free of treated, coated, padded or heavily printed stock.	1/2%	2%	260
Sorted Office Paper #1	Paper generated by offices containing primarily white and colored groundwood free paper, free of unbleached fiber, with very small quantify of groundwood and fax paper.	2%	5%	195
Sorted Office Paper #2	Paper generated by offices containing primarily white and colored groundwood free paper, substantially free of unbleached fiber, with moderate quantities of computer and tablet groundwood and fax paper. SOP #2 only receives slight upgrading to separate gross outthrows.	4%	7%	130
Mixed Office Waste	Paper generated by offices containing white and colored groundwood free paper, with significant quantities of file stock, computer and tablet groundwood and fax paper and browns. Typically consists of an unsorted low-end office mix with little or no upgrading.	6%	10%	100
Corrugated Containers	Corrugated containers having liners of either test liner, jute or kraft; does not include wet strength carrier stock or other non corrugated kraft stock.	1%	5%	75
#8 Newspapers	Fresh dry newspapers, not sunburned, free from magazines, white blank, pressroom overissues, and paper other than news, containing not more than the normal percentage of rotogravure and colored sections.	None	1/4 of 1%	50
#7 Newspapers	Fresh dry newspapers, not sunburned, free from paper other than news, containing not more than the normal percentage of rotogravure and colored sections; most mills will also accept up to 1/3 magazines.	None	1%	50
#6 Newspapers	Newspapers containing less than 5% of other papers such as advertising inserts.	1/2 of 1%	2%	40

Source: Institute of Scrap Recycling Industries, Inc.

Brokers in Colorado for Paper Markets:

Weyerhaeuser
303-297-2312

Tri-R Recycling
303-399-6351

Smurfit
303-820-2870

Les Mendelson & Associates
303-861-1181

You should proceed early on to talk directly with end markets or with brokers who can help you find end markets best suited to meet your needs. The chart to the left lists the major paper brokers in Colorado.

Perhaps most important for commercial haulers will be the completion of Weyerhaeuser's new automated paper processing plant in Denver, scheduled to open in 2001. The reason why this facility can be key for a new hauler is that the company indicates [1] the plant will have the ability to handle heavily mixed office paper loads and [2] it prefers to buy unbaled, loose loaded material direct at its door. This means that Weyerhaeuser may offer an alternative for some new haulers in areas either without sorting and baling facilities, or with such facilities, but where those facilities are owned by a competitor charging disadvantageous rates.

The ultimate decision regarding whether, how and where to separate grades will require an in-depth analysis that considers the cost to have a processing facility sort, bale and market mixed paper loads off the truck. That cost could be \$40-\$50/ton. On the other hand, it will cost a hauler \$60-\$80 for each hour the collection vehicle is off the route, and an automated facility like Weyerhaeuser's will have to pay some discount from the higher grades in the load in order to recover its sortation costs.

BIDDING

Barriers to Entry

The first step to determine whether it is feasible to enter the commercial market for recycling service is to find out whether there are contractual impediments to new entry in the city or region that you would like to serve.

Potential Impediments to Competing

Evergreen contracts

MRF controlled by national vertically integrated companies

There is no single rule about how arrangements are made for recycling services with commercial customers. Historically, though, some of the national integrated waste firms have attempted to lock down perpetual, automatically renewing contracts with customers in order, antitrust regulators have determined, to fence out competition. These are called "evergreen" contracts because of the difficulty a customer has in extricating him or herself from the contract to switch to another hauler. Typically, these contracts run for three to five years and automatically renew if the customer has not provided written notice of intent to terminate 60 days prior to the end of the contract.

In addition, many of these contracts contain clauses that have been alleged to constitute rights-of-first-refusal even if a customer files a timely termination notice. These clauses have been known to be interpreted by haulers to require that a customer provide notice of a lower bid from a competitor, essentially giving the large hauler the right to match or beat that bid before the customer can move to a competitor even after the contract has ostensibly expired.

Pressure from antitrust prosecutors, who have made the elimination of these evergreen contracts a condition of approving the recent spate of mega-mergers, has resulted in the prohibition of this exclusionary practice in some parts of the country. However, even in these areas, compliance is thought to be spotty at best.

For these reasons, it is important to first determine the status of contracting in your region. Visit prospective customers who have recycle containers in their parking lots from the dominant waste and recycle companies, and ask if you could see their current hauling contracts to make a counter offer. If evergreen contracting is pervasive, it will be necessary for you to alter that situation before you have a chance of successfully competing.

Call, write or visit antitrust regulators, provide them with a copy of the evergreen contracts, explain that you would like to enter the market but cannot do so if those contracts are not decreed to violate antitrust laws, and ask for their assistance on a confidential basis.

Antitrust Regulators

U.S. Department of Justice

Anthony Harris
Assistant Attorney General
Anti-Trust Division
950 Pennsylvania Avenue N.W.
Washington, D.C. 20444
Tel: 202-307-6583
Fax: 202-514-9033
E-Mail: anthony.harris@usdoj.gov

Colorado Office of the Attorney General

Jan Michael Zavislan
Deputy Attorney General for Consumer Protection
1525 Sherman Street 5th Floor
Denver, CO 80203
Tel: 303 866 5079
Fax: 303-866-5443
E-mail: jan.zavislan@state.co.us

If evergreen contracts are common in your area, and anti-trust regulators will not help overcome that hurdle, then you may want to temporarily shift your entry plan to begin by offering roll-off service. Roll-off service involves providing drop boxes to households, businesses and construction companies which have large, one-time quantities of non-putrescible debris to discard, and then picking up the drop boxes when they are full or the project is completed. Because drop boxes are one-time events, they do not involve long-term contracts that might interpose impediments to new entry. Also, picking up a drop box is far less time-sensitive than emptying a toter or dumpster, and, consequently, a back-up vehicle will not be as necessary. Once you have established a presence handling discards in your area, it will become easier to transition back into offering recycle service.

Another area of concern that may impede your ability to fairly compete exists if the only material recovery facility in your area is also controlled by one of the national vertically-integrated companies, because this permits them to subject you to a price squeeze. In a price squeeze, the dominant integrated firm posts a gate price at the MRF which you must pay, but then internally bills its own trucks a lower discounted rate (or in the case of recyclables which can have a positive net value, a lower payment).

If this situation exists, it may be necessary to only collect those materials that either can be directly hauled to an end market, thereby bypassing the controlled MRF, or off-loaded onto a rudimentary transfer operation.

Matching the Majors

In the waste hauling market, it is very difficult for small independents to succeed when the integrated giants control all of the landfills in the region, because the independent can be subjected to price squeezes. This is not as significant a problem in recycling, however, because there are no barriers to entry into diversion efforts as there are for landfilling.

Though the national integrated waste and recycling companies are large, this does not mean that you cannot compete. So long as anti-competitive practices such as those described earlier are not commonplace, a small but dedicated entrepreneur can win contracts to provide recycling service and be successful.

One way is to sell service, not price, which an independent is sometimes better situated to provide than a national company with headquarters in a distant state. Demonstrate your commitment to provide better service by, for example, giving customers your home number if there is ever a problem outside of business hours, or offering a contract clause with an escape hatch in the event you fail to provide promised service and do not correct the situation by the next day.

Pricing Your Service

Fees for recycle service are typically set on the basis of the size and number of containers, the number of times the customer wants them pulled, and the cost of processing minus revenues from marketing the material. Thus there would be, in the most common case, a specified charge for leaving a two-yard container at a customer's site, and pulling it once or twice a week. This might work out to \$50-\$100/month for twice a week service, or \$35-\$50/month for once a week service.

The calculation includes amortization of all capital costs for vehicles, containers, garage and administrative offices; labor to operate, maintain and administer the number of vehicles needed to serve the routes (including backup trucks), and other variable expenses for utilities, parts, fuel, insurance and licensing fees; and a fair return on your investment.

Also, the calculation needs to include recognition for the net costs of marketing the recyclables, including sorting, densifying, marketing and shipping (as applicable), and net benefits, including revenues from the sale of the material. The costs will be a function of the method, which you have selected to process the paper and containers, which is a straightforward calculation. On the other hand, the revenues are hard to predict since collected materials are sold on the commodity market. The price paid in Denver for loose old corrugated cardboard (OCC) and sorted office paper (SOP) grades have fluctuated significantly over the last four years.

Changing the rates you charge your customers in tandem with these wild commodity price swings will not build customer loyalty. You will need to either engage in options trading to seek to hedge against the volatility in these markets (though this practice has transaction costs that are difficult for a small firm to absorb) or look at long-term trends and specify your charges in relation to the mean values, so long as you have sufficient working capital to weather the troughs of the cycle. The following table shows the mean, maximum, minimum and standard deviation (a measure of the price swings) from 1996-2000 for OCC and SOP.

Corrugated and Office Paper Price Statistics 1996-2000		
	OCC	SOP
Average	\$16.68	\$16.15
Maximum	\$28.00	\$38.00
Minimum	\$6.00	\$5.00
Std Deviation	\$4.45	\$7.13

Source: Waste News Markets Page

Not only do you need to specify an appropriate charge for your service, you also need to seek at least a one-year contract so that you are not subjected to a bidding war to maintain your existing customers every week. Typically, contracts contain provisions for periodic escalators based upon official indices such as the CPI, downside protection you must have if your contracts are longer than one year. Also, as discussed earlier, you can show your confidence in your ability to provide better service by permitting the customer to withdraw from the contract if you do not meet the specified service, and, upon being notified of the deficiency, do not correct the situation within 24 hours.

CONCLUSION

Recycling is not rocket science, but it does demand attention to detail and hard work. As long as the integrated haulers in your area do not engage in anti-competitive practices, it is possible to enter the market for recycle services if you have carefully researched a niche where an independent can successfully operate.

The purpose of this User's Guide has been to lay out the basics on how to begin scoping the market, developing your business plan, securing financing and laying down operations.

The Future Lives of Recycled Materials

Paper:

Paper products, including cardboard, paperboard, office paper, and newsprint, all undergo a similar recycling process in order to be turned back into useful paper products. Making paper from recycled fiber takes only about one-half the water and from 22-64% percent of the energy it takes to make paper from trees. Once recovered paper is received at a recycling mill, hot water is added to the paper in a huge rotating vat called a beater. The hot water and blender action soak and separate the paper fibers, and what results is a slurry or pulp which can then be passed through screens to remove paper clips, staples, and other contaminants. Inks from the paper are removed both by mechanical and chemical processes.

At some mills, glossy magazines are added to newspaper pulp because when the pulp is aerated, the clay coating on the magazines helps lift the ink from the newsprint. Chlorine or chlorine compounds are still by far the most popular chemical de-inkers in the United States, although much safer chlorine-free (or TCF) processes are used by a minority of mills.

Before the pulp is formed into new paper, virgin fiber may be added to improve paper strength or brightness. After de-inking and mixing, the pulp is spread over large screens and pressed by massive rollers, which dry the pulp and form it into continuous sheets of paper. The newly recycled paper is collected on rolls and may be cut to size before marketing. Typically, paper collected through recycling programs is used to make new paper products such as corrugated boxes, newspaper, and copy or printing papers; occasionally, poor quality paper will be used in the manufacture of products such as asphalt shingles, insulation, and animal bedding. On average, only about 10% of the fiber in US paper products is post-consumer recycled material. Corporate and government purchasing policies, along with increased private consumer demand for recycled-content papers, can help boost this percentage.

Plastics:

Plastics collected for recycling are first sorted, either manually or by automated sorting equipment, and then sold to remanufacturers who shred the plastics and prepare them for re-introduction into a manufacturing process. Plastic chips are melted to a consistency suitable for the specific manufacturing process for which they are intended—whether that be an “extrusion” or “injection-mold” process. Recycled plastics are made into a wide variety of products. In the United States, Polyethylene Terephthalate (PETE), the “soda bottle” plastic, is made into products such as carpet fiber, polyester clothing, and fill for sleeping bags or jackets. (It takes about five two-liter recycled soft drink bottles to make enough fill materials for an adult’s ski jacket, and about thirty-six of those bottles to make a square yard of carpet.) High-Density Polyethylene (HDPE), the “milk jug” plastic, may be made into injection-molded toys and handles for scissors and other tools. Other types of plastic resins can be combined to make items such as landscaping timbers, car stops, and plastic lumber. Outside of the United States, recycled plastics are commonly used in the manufacture of food and beverage containers. Recycling plastic saves enormous costs and resources associated with the primary extraction and refining of the petroleum products from which virgin plastics are derived.

Aluminum:

Like many other metals, aluminum can be recycled almost indefinitely, using only 5% of the energy it takes to produce aluminum from bauxite ore. In addition, only about 1/20th of the water and air pollution results. Much of the avoided wastes are associated with the exploitation and refining of bauxite ore. Aluminum collected through recycling programs is shipped to aluminum smelters, which typically combine the recycled aluminum with a proportion of the virgin metal extracted from ore. The aluminum is melted at a high temperature and the impurities removed; then, the metal is cooled and rolled out into sheets for manufacture into new beverage cans, aluminum foil, and other everyday aluminum products.

Steel:

As with aluminum, steel collected through recycling programs is sent to a foundry where it is melted and purified (typically in combination with a percentage of virgin steel) at extremely high temperatures. The molten steel is then cooled, pressed, rolled, and cut into new structural steel for use in the manufacture of cans, sheet metal, car parts, metal hardware, construction products, and other items. Making steel products from recycled steel uses only about 65% of the energy it would take to make them from virgin steel, and avoids all the mining and refining wastes associated with extracting metal from ore.

Glass:

Recycled glass must be very carefully sorted before it is melted in a furnace on its way to becoming a new glass bottle or jar. Even the smallest bit of contamination in a load of glass—a rock, a bit of porcelain, a sliver of Pyrex—can create flaws in the end-products that render those items unfit for use. Depending on the precise end-use intended, recycled glass is sorted according to color, then melted and mixed with sand, soda ash, limestone and other ingredients to make a finished product such as a beer bottle or mayonnaise jar. Some recycled glass is used in non-container applications such as insulation products, “glassphalt,” and fill material for utility line trenches. Making glass from recovered glass is slightly less energy intensive than making it from raw materials, but is much less wasteful since the wastes associated with mining and refining raw materials can be avoided.

Buy Recycled - Close the Loop

The true success of recycling is dependent on more than just putting recyclables in a bin. Resources are saved only when recycled products are purchased. This is referred to as “closing the loop.” To create a viable market for products made from recycled materials, we must always strive to “buy recycled” at every opportunity.

Due to the dramatic increase in paper consumption in the United States, especially in the commercial sector, closing the loop is now more important than ever. Ninety five percent of old-growth forests in the United States are already gone. By choosing recycled products, natural resource destruction is decreased, landfill space is preserved, and energy is saved. Indeed, true recycling means buying recycled.

Today, the quality and variety of recycled products is excellent. For instance, recycled paper varieties include: colored paper, white office paper, computer paper, card stock, envelopes, bathroom tissue, and hand towels. When ordering, ask for paper made from the highest percentage of recycled content material, preferably “post-consumer” content (see definitions below). Pricing is, in many instances, comparable to pricing for virgin materials.

Business purchasing decisions have an enormous impact on the planet. Purchasing agents have access to recycled products which can save money and foster goodwill among employees and customers. A Gallup Poll has shown that more than 70% of consumers want to support businesses that recycle or offer recycled products. Many consumers want environmental accountability from businesses.

By purchasing recycled products, businesses can meet the challenge of creating a viable market for products made from the recycled materials they collect. Through practicing source reduction, which means purchasing only what is truly needed, businesses can save thousands of dollars in materials, inventory storage, and waste disposal costs. And by creating “Waste Guidelines” for vendors and contractors, they can avoid becoming responsible for others’ waste costs.

Helpful web sites and other resources on buying recycled products can be found in the Appendix to this guide.



THE COST OF RECYCLED PRODUCTS

The price of some recycled products is cheaper or similarly priced to their virgin counterparts. For example, recycled toner cartridges cost about half of non-recycled ones. In addition, recycled copy paper is often priced competitively with virgin paper. Some products are more expensive up front but save money over time. For example, recycled plastic parking blocks or plastic decking costs more in the beginning but save money in the long run because plastic products outlast wood or concrete and need less maintenance. Businesses can also use the savings to subsidize the purchase of certain recycled products, which may cost a little more.

Compare your business’s cost ratio for recycling as compared to the costs of your trash disposal. This is analogous to the costs of preserving an eco-system as compared to the astronomical taxpayer-borne costs of cleaning it up or trying to restore it once it has been trashed. Each of us as consumers can make a real difference in the world by sending the message to manufacturers that we want recycled products. As the demand increases, the supply will increase. And as the supply increases so will competition, which will

make all the recycled products even more cost competitive. Business owners or purchasing agents can with a single stroke of a pen purchase more recycled products than the average individual would use in years, or even a lifetime.

Some recycled products may be more expensive than virgin products because of government virgin product subsidies, which artificially lowers their price. Other reasons may include:

- The product is a new technology
- The products are produced in smaller quantities (large quantities of a product are less expensive)
- The products are not yet widely and efficiently distributed
- The environmental costs of competing products are not captured in the price of the product

BUYING RECYCLED SAVES NATURAL RESOURCES

Buying recycled products can have a profound effect on curbing the destruction of natural resources. For example, making paper from 100% “post-consumer” material instead of virgin resources:

- Requires 64% less energy
- Uses 58% less water
- Creates 74% less air pollution
- Creates 35% less water pollution
- Conserves forests and reduces what we throw away

If every house in the U.S. replaced just one roll of virgin fiber bathroom tissue with 100% recycled tissue, 373,000 trees, 1.48 million cubic feet of landfill space and 155 million gallons of water would be saved.

LOOK FOR “POST-CONSUMER” CONTENT IN RECYCLED PRODUCTS

The two terms used to indicate the source of recycled material in recycled products are “post-consumer” content and “pre-consumer” content. Post-consumer material comes from the recyclable materials people put in recycling bins every day, while pre-consumer material is scrap left over from industry production processes. It is essential that purchasers look for the

highest amount of post-consumer content possible in order to sustain demand for the recyclables going out their door. By buying “post-consumer” products purchasers are supporting a system that prevents recyclables from going to a landfill and thus lessening the burden on our natural resources.

BUYING TODAY’S MOST ENVIRONMENTALLY-SOUND PAPERS

There are three critical questions to consider when choosing paper for printing needs.

1. Was the paper produced using the highest possible post-consumer recycled or tree-free content?

Most of the time “post-consumer” means that a consumer actually used the paper and returned it to a recycling center. If a paper label says that the paper has 50% recycled content / 10% post-consumer, that means that 40% of the paper’s recycled content came from mill waste.

Tree-free paper seems like a radical idea in the United States. But the fact is paper has only been made from trees for the past 150 years. Here in the United States, we are “rediscovering” our ability to make paper from other products, while in the rest of the world, mills have never stopped making paper from agricultural waste and other fibrous plants. Today you can purchase papers, which are made partially or wholly from cotton, bamboo, bagasse (sugar cane residue), kenaf, hemp, rags, old money, banana stalk, and cereal straw. Kenaf, a relative of the hibiscus plant, produces more fibers in less time than timber grown for paper.

2. Was the paper bleached with organochlorides?

According to Conservatree Paper Company, pulp and paper mills using chlorine for bleaching produce up to 1,000 chlorinated organic compounds, including dioxins, furans, and PCBs. The best known of these compounds is 2,3,7,8,-TCDD, considered to be the most potent chemical toxin known. Studies have shown this compound to be highly carcinogenic, capable of suppressing the immune system, and acting as a hormone disrupter causing reproductive and development disorders in wildlife, lab animals and probably humans. It is bioaccumulative, which means it remains in the bodies of organisms that ingest it, and that contamination moves up each step on the food chain.

Papers labeled “PCF” are Processed Chlorine-Free. This means the recycled content of the paper, while it may have originally been processed with chlorine, is unbleached or bleached without chlorine or chlorine derivatives during reprocessing. Any virgin material portion of the paper must be “TCF” or Totally Chlorine Free. Papers labeled “ECF,” or Elemental Chlorine-Free, are processed with a chlorine derivative such as chlorine dioxide. Although less harmful than using chlorine, it is still considerably worse for the environment than TCF or PCF paper.



3. What if Environmentally-Sound Paper Costs More?

If environmentally sound paper costs more, look to spend the same total amount of money as you would on virgin paper by purchasing less paper and cutting down the amount you use by:

- Updating mailing lists, eliminating duplication, and putting “address correction requested” on all your mailings to reduce waste
- Reducing font size and margins on documents
- Using both sides of the paper
- Using e-mail or bulletin boards instead of memos or faxes
- Using fax sticky notes rather than a whole sheet of paper for fax cover sheets

GUIDELINES FOR PURCHASING RECYCLED PRODUCTS

Use the following tips to guide your purchases of recycled-content products.

1. Identify your purchasing targets for recycled products, set goals, and work with your company's Green Team to achieve them.
2. Become educated about recycled products. Recycled products are equal to or superior to their virgin counterparts in every respect, including performance, quality and price.
3. Review purchasing specifications to eliminate unduly restrictive requirements such as:
 - Paper brightness and opacity standards which may preclude suitable recycled paper products
 - “All-or-none” clauses which may exclude recycled product vendors
 - Clauses that require virgin materials
4. Incorporate “green” preferences in purchasing documents and use price preferences where possible. Some recycled-content products initially save money, while others cost more up-front. However, green products can save you money over the long term in reduced maintenance costs or increased product life expectancy. To facilitate the purchase of green products, businesses can use a reasonable preference of five to ten percent, employ life-cycle costing, or use set asides. Any extra cost could be viewed as an investment in your waste reduction program. Extra expense for high quality tree-free or high post-consumer content letterhead or other items with public exposure could be viewed as a public relations or advertising expense to help position the company as an environmentally responsible member of the community.
5. Formally notify suppliers about your company's commitment to buying recycled goods.
6. Test products, obtain input from users and sample new products in your office before purchasing them. To gain unbiased information, you may want to perform blind tests and inform users of test results afterwards.

THREE TIPS FOR PURCHASERS OF RECYCLED PRODUCTS

What your company buys has a direct relationship to what it throws away. Also, it is not enough to have only one member of purchasing involved in your waste reduction and buy-recycled efforts. Everyone who makes buying decisions must participate in order to control your company's waste.

1. Provide a training workshop for your buyers (include a speaker, if possible) complete with numerous examples of waste-conscious purchasing decisions - including both environmental and financial impact.
2. Work with purchasing to develop a company purchasing policy. By writing a formal policy incorporating the principles stated below you can assure that money saving, environmentally-friendly purchasing programs will become institutionalized within your company.

Sample principles:

- Reduce material waste by buying only what is needed
 - Buy products containing recycled material
 - Buy in bulk to reduce unit prices and packaging
 - Buy products with the highest post-consumer recycled content available
 - Purchase only those materials and packaging that are recyclable through your company's program
 - Consider the full life-cycle costs of purchases, including disposal
3. Follow up with your buyers at least twice a year and update your procurement policy as needed. At yearly workshops, be sure to include opportunities for buyers to share their personal examples of waste-conscious, money-saving purchases with the rest of the team. You may want to hold a green buying contest among the purchasing staff. Track buyers' purchases for a set period (e.g. a month or a quarter), and award a prize to the employee responsible for switching the largest volume of purchases to environmentally preferable products.

EXAMPLES OF ENVIRONMENTALLY-FRIENDLY PURCHASES:

- Post-consumer recycled copier and printer paper, cardboard and envelopes
- Post-consumer recycled white, versus Kraft (brown), over-sized envelopes (Kraft envelopes are difficult to recycle)
- Post-consumer recycled white ledger and legal pads, not yellow (white is higher quality paper to recycle)
- Papers not bleached or de-inked using chlorine and its derivatives
- Mailing labels and other sticky products with a water-soluble base
- Pastel-colored paper and Post-its, not fluorescent paper (deeply-colored papers are not recyclable)
- Recycled/remanufactured toner and printer cartridges versus new cartridges
- Refillable ink pens and mechanical pencils
- Lighter weight cardboard for shipping of lighter weight materials
- Biodegradable cleaning products
- Recycled plastic parking stops and picnic benches
- Re-refined oil
- Compost in place of some commercial fertilizers
- Cellulose insulation made from old newsprint
- Retread tires
- Fax sticky notes to replace fax cover sheets

A comprehensive list of recycled products can be found in the Appendix to this guide.

DEFINITIONS OF TERMS

Recycled:

Any product manufactured with materials diverted from the waste stream - either pre-consumer or post-consumer materials.

Recyclable:

Any product which can be used again in the manufacture of new products. The recycling symbol is not regulated and can appear on any product. Even if the product is marked with the recycling symbol and says "Please Recycle" this means nothing if the product cannot be recycled locally. Unless specified, products with the recyclable label contain no recycled content.

Post-consumer Materials:

Items used and recycled by a consumer like you, sold to manufacturers, and made into new products. These items represent the greatest benefit to the environment when used in the manufacture of new products because they save landfill space, decrease demand for virgin resources, save energy and reduce pollution in remanufacturing. When post-consumer materials are purchased by manufacturers, markets are stabilized for recycling collection programs.

Pre-consumer Materials:

Known as post-industrial materials, these include production overruns, material trimmings, damaged products, and other items generated in the production stages of manufacturing. Not only is there an economic incentive for manufacturers to use these materials, recycling or reuse of these materials saves landfill space and virgin resources.

SAMPLE BUY RECYCLED POLICY EXCERPTS

Official "buy recycled" policy excerpts from Dupont, McDonald's and the City of Tucson can be found in the Appendix to this guide.

STONYFIELD FARM
MEMO

As I hope all of you know already, Stonyfield Farm has a recycled paper purchasing policy. We are striving for 100% use of recycled paper. Using recycled paper saves trees, energy, and water and decreases air pollution.

We have identified an environmentally superior paper (with high post-consumer content), which will become our primary copying paper. This paper is not bleached, so it is a light grey rather than the usual bright white we have always used. However, this paper copies with the same ease and clarity as white paper. By using (our new) copier paper, Stonyfield will save the following in one year:

- 150 trees
- 8,200 kWh of energy
- 61,600 gallons of water
- the emission of 528 pounds of air pollution

Please notify us if you have any problems with the new paper. Thank you for helping us lighten our impact on the planet and create a brighter future for our children.

A sample memo to employees regarding new recycled copier paper (From Stonyfield Farm Inc.)

Appendix A

GUIDE TO HARD-TO-RECYCLE MATERIALS

When it comes to recycling, most people think of bottles, cans and newspaper. Yet, businesses that want to recycle odd items like light bulbs and batteries have options as well. These items are more complex to recycle due to either their hazardous make-up or because they are made of several different types of material.

The following companies specialize in recycling or reusing odd items. Please call first to confirm their recycling guidelines.

All Items (Call for particular need)

EXTRA's for Education, Boulder: Tel. 303-823-9460. Provides schools with reusable office supplies, furniture, and excess inventory from businesses.

Creative Exchange, Denver: Tel. 303-377-8553. Clean and/or unusual material used for school art projects.

Colorado Materials Exchange, Boulder: Tel. 303-492-4330, www.colorado.edu/cure/comex. A clearinghouse for businesses to exchange surplus goods and scrap material.

Appliances

Vietnam Veterans of America: Tel. 800-775-8387

Unwanted Appliances: Tel. 303-430-7142, www.unwanted.com

Batteries (alkaline)

See also www.batteryrecycling.com

Grainger: Tel. 303-371-2360 for orders. Call 847-535-9000 for technical support.

Recycle Lights, Minneapolis, MN: Tel. 800-831-2852

Inmetco, Ellwood City, PA: Tel. 724-758-2800, www.inmetco.com

Retrofit Inc., St. Paul, MN: Tel. 651-766-7422, www.retrofitcompanies.com

Batteries (Ni-Cad)

Rechargeable Battery Recycling Corp: Tel. 800-822-8837, www.rbrc.com

Cell Phones

The Wireless Foundation / Motorola, Ann Arbor, MI: www.wirelessfoundation.org. Donates phones to abuse victims through their Call to Protect program.

CD Roms

Eco Disk, Takoma, WA: Tel. 253-471-1800, www.ecodisk.com or www.supercd.com

Computers and other electronics

Computers for Community, Aurora: Tel. 720-859-0325

North American Technology Exchange, Boulder: Tel. 303-443-1984

Action Computers, Denver: Tel. 303-759-1668

Technology Recycling Consultants, Boulder/Aurora: Tel. 303-766-9608

Eagle Computer Tek, Inc (formerly TH Electronics), Ft Collins: Tel. 970-224-2868

Retrofit Inc., St. Paul, MN; Tel. 651-766-7422, www.retrofitcompanies.com

Demolition & Deconstruction

ReSource 2000, Boulder: Tel. 303-441-3278

Diskettes & other Computer Media

Eco Disk, Takoma, WA: Tel. 253-471-1800, www.ecodisk.com or www.supercd.com

Floppies for Kiddies, Covington LA: Tel. 504-898-2158, www.usacitylink.com/disks/. Floppies are distributed to people in need.

NE-SAR Systems, Darlington, PA: Tel. 724-827-8172. Only accepts compact computer disks and audio CDs.

Foam and Padding

See Styrofoam©

Furniture

Office Liquidators, Denver: Tel. 303-759-3375

Providers Resource Clearinghouse, Denver: Tel. 303-296-8580

Light Bulbs

Colorado Lighting, Denver: Tel. 303-288-3152, www.coloradolighting.com

Grainger, Boulder/Denver: Tel. 303-371-2360 for orders. Call 847-535-9000 for technical support.

Earth Protection Services, Phoenix, AZ: Tel. 800-414-0443, www.earthpro.com

Superior Special Services (formerly Recycle Lights), Bloomington, MN: Tel. 800-831-2852, www.superiorspecialservices.com

GreenLites, Mason, MI: Tel. 810-997-0044

Retrofit Inc. (formerly Light Cycle), St. Paul, MN: Tel. 651-766-7422, www.retrofitcompanies.com

Eastern Environmental Tech, Port Chester, NY: Tel. 914-934-2100, www.easternenvironmental.com

Mercury Waste Solutions, Union Grove, WI: Tel. 800-741-3343, www.mercurywastesolutions.com

USA Lamp and Ballast Recyclers, Cincinnati, OH: 800-778-6645, www.usalamp.com

Organic Waste

A-1 Organics, Golden: Tel. 303-384-9232 (food scraps, landscaping waste). A fee is charged.

Wood Recovery Systems, Longmont: Tel. 772-2684. Wood is ground into mulch.

Pallets

Triple H, Boulder: Tel. 303-499-9533

Road Runner, Arvada: Tel. 303-431-5541

Wood Recovery Systems, Longmont: Tel. 303-772-2684

Printer Cartridges

Aspen Laser, Boulder: Tel. 303-530-2922

Hard Copy Recycling, Longmont: Tel. 303-772-2902, www.hardcopyrecycling.com

Styrofoam® Blocks, Foam Padding, Cushions

Styrofoam “peanuts” can be reused by most mail packaging stores

Packaging Resources, Longmont: 303-776-0922, www.packagingexcellence.com. Recycling services provided only for retail customers.

Tapes

Peripheral Manufacturing, Denver: 303-371-8651. Accepts 4mm, 8mm and 9mm track and dat tapes - some video tapes too. Call first.

Transparencies

3M - GEMARK: Tel. 570-654-5511 ext. 21

Tyvek(Envelopes (rip-proof type)

Tyvek: 800-222-5676

Video Tapes

EcoMedia, Annaheim, CA: Tel. 800-359-4601

Appendix B

RECYCLING SURVEY FOR EMPLOYEES*

Name _____ Date _____ Interviewer _____

1. How long have you worked at this company?

- less than a year 1 -2 years 2 -5 years 5 - 10 years 10+ years

2. What building(s) do you work in? In which department?

3. Are you aware that we have a recycling program?

- Yes No - skip to question 9

4. On a scale of 1-5, 5 being very easy and 1 being very difficult, how easy is it for you to participate in the recycling programs?

- 1 (Very Difficult) 2 (Difficult) 3 (Neutral) 4 (Easy) 5 (Very Easy) - don't know, no opinion

Comments:

5. What types of materials do you recycle?

If answered "none" to above question, ask this next question. Otherwise, skip to next question.

6. Why don't you recycle any materials here?

7. What other materials are you aware of that can be recycled?

If answered "none" to above question, skip this next question.

8. If you are aware that these other materials can be recycled, why do you not recycle them?

9. What do you think are the business benefits and drawbacks of the recycling program?

10. On a scale of 1-5, 5 being very important and 1 being very unimportant, how important do you think it is for this company to support recycling programs?

- 1 (Very Unimportant) 2 (Unimportant) 3 (Neutral) 4 (Important) 5 (Very Important) - don't know, no opinion

Comments:

11. Using the same scale, how important do you think it is for you personally to support our recycling programs?

- 1 (Very Unimportant) 2 (Unimportant) 3 (Neutral) 4 (Important) 5 (Very Important) - don't know, no opinion

Comments:

12. What things, other than recycling, do you think we can do to reduce the amount of trash we send to landfills?

13. What do you think are the benefits of recycling to the environment in general?

14. What do you think are the drawbacks of recycling to the environment in general?

*adapted from a survey developed by MicroMotion in Boulder, CO

Appendix C

SAMPLE BUY RECYCLED POLICY EXCERPTS

Dupont:

“Resolved, that in furtherance of Dupont’s commitment to its waste management policy, it is the policy of Dupont to preferentially purchase items made of recycled materials where such products meet our continuously improving quality requirements and are available at reasonable prices and terms.”

McDonalds:

“We are committed to the maximum use of recycled materials in the construction, equipping, and operations of our restaurants. We maintain the industry’s largest repository of information on [recycled product] suppliers, and will spend a minimum of \$100 million a year on the use of recycled materials of all kinds.”

City of Tucson:

“We are greatly concerned about the environmental needs of today and tomorrow. In an effort to be a leader in this area, the City has adopted the Resource Efficient Procurement and Utilization Policy and prefers products which reduce waste at the source, are reusable, are re-manufactured and/or which contain recycled materials. Bidders are encouraged to offer alternative products which meet these goals. Each bidder must submit the required information about their products as specified in the bid document. Bidders which fail to submit this information may be considered non-responsive and their bid may not be considered for award.”

Appendix D

EXAMPLES OF CURRENTLY AVAILABLE RECYCLED PRODUCTS

Construction Materials	Paper Products
Asphalt Acoustic ceiling tiles Carpet Concrete Plastic products (decking, drain pipe, fence posts and fencing, floor tiles, lumber)	Adding machine and cash register tape Bond/letterhead Coated and uncoated printing papers Computer paper Copier paper Corrugated and paperboard boxes Envelopes Mailing tubes Newsprint Office supplies (calendars, fax paper, file folders, labels, writing tablets) Tissue and towel products
Plastic Products	Transportation Uses
Bags Boxes, bins, and containers Carpet Lumber (and other construction materials, see above) Mats Office supplies (Desk sets, high lighters, markers, pens, pencils, rulers, toner cartridges) Parking stops Picnic tables and benches Safety barriers	Anti-freeze Retread tires Road signs and posts

Appendix E

BUY RECYCLED RESOURCES

10 Easy Ways to Buy Recycled.

This guidebook, published by the California Department of Conservation and California Integrated Waste Management Board, includes useful tips, resources, and product information for consumers and businesses alike. To order a copy, contact the California Department of Conservation, Division of Recycling, 801 K Street, Sacramento, CA 95814. Phone: 916 445-1490.

Buy Recycled Guidebook,

National Recycling Coalition-Buy Recycled Business Alliance, 1727 King Street, Suite 105, Alexandria, VA 22314. Phone: (703) 683-9025, Fax: (703) 683-9026. Website: www.brba.nrc-recycle.org.

Guide to Buying Recycled Products for Consumers and Small Business.

This guide lists nearly 400 products made from recycled materials, shows their post-consumer and total recycled content, and tells where to buy them: 44 pages, \$3 postage paid for Pennsylvania residents, \$4 postage paid for out-of-state residents. For more information, contact the Pennsylvania Resources Council, 3606 Providence Road, Newtown Square, PA 19073. Phone: 610 353-1555. Website: www.prc.org.

The Official Recycled Products Guide.

This directory lists manufacturers and distributors for more than 5,000 recycled products. For more information, contact the Recycling Data Management Corporation, P.O. Box 577, Ogdensburg, NY 13669. Phone: 800 267-0707.

Directory of Recycled-Content Building and Construction Products.

This regional directory includes 500 construction and building products manufactured with recycled content. To order a copy, contact the Clean Washington Center, First Interstate Center, 999 Third Avenue, Suite 1060, Seattle, WA 98104. Free to Washington residents, \$20 for others. Phone: 206 464-7040. Fax: 206 464-6902. Website: www.cwc.org.

Buy Recycled Web Sites

Conservatree

This site provides information on environmentally sound printing and writing papers.
<http://www.conservatree.com/>

Pacific Northwest Pollution Prevention Resource Center

This site helps businesses implement environmentally preferred, “green” purchasing programs.
www.pprc.org/pprc/pubs/topics/envpurch.html

EPA Environmental Preferable Purchasing Web Site

These sites put a wealth of “buy recycled” information at your fingertips.
www.epa.gov/oppt/epp
www.epa.gov/epaoswer/non-hw/procure/factshts.htm

Buy Recycled Business Alliance (BRBA)

This site includes the list of Steering Committee members, links to state partners, an online library, a discussion forum, an events calendar, case studies of successful business buy-recycled efforts, and information on state buy-recycled programs for businesses.
<http://brba.nrc-recycle.org>

Products for a Better World

This site considers factors for choosing an environmentally friendly paper based upon recycled content, bleaching, the use of acids, and how it affects the growing scarcity of wood pulp.
<http://www.betterworld.com/BWZ/9512/product.htm>

Appendix F

COLORADO RESOURCES: WASTE REDUCTION AND RECYCLING

For further expertise or information on your businesses' quest to reduce waste and expenses, the following organizations may prove helpful:

Buy Recycled Business Alliance

1727 King Street, Suite 105
Alexandria, VA 22314-2720
Phone: 703-683-9025
Fax: 703-683-9206

Information on procuring recycled content products.

Colorado Association for Recycling

P.O. Box 11130
Denver, CO 80210
Tel. 970-535-4053
www.cafr.org
Business recycling information and links.

Creative Exchange

5327 E. Colfax
Denver, CO 80202
303-377-8553
Clean, unusual and fun materials from businesses that would otherwise be dumped into the landfill are distributed to teachers, students and community-based organizations for use in the arts, creative learning and play.

Colorado Dept. of Public Health and Environment

4300 Cherry Creek Dr. South
Denver, CO 80223-1530
303-692-3300
Technical assistance and general information on all waste types.

Colorado Materials Exchange University of Colorado

Contact: Jack DeBell
University of Colorado - Recycling
Campus Box 207, Boulder, CO 80309
www.colorado.edu/cure/comex
Tel. 303-492-8307
A statewide clearinghouse for a variety of businesses to exchange surplus, durable goods and reusable non-hazardous materials as a means of waste reduction, reuse and recycling.

Colorado Recycles

Contact: Dianne Beal
8745 W. 14th Ave, Ste. 216
Lakewood, CO 80215
Tel. 303-231-9972
www.colorado-recycles.org
Region specific information on recycling in Colorado.

Environmental Protection Agency, Pollution

Prevention Division
Contact: Judy Wong, George Donnelly
999 18th Street, Ste. 500
Denver, CO 80202-2466
www.1800cleanup.org/index.htm
Judy Wong: Tel. 303-312-6390
George Donnelly: Tel. 303-312-6193
General information, technical and regulatory assistance.

EXTRAs! for education

Contact: Catherine BeDell
P.O. Box 4385, Boulder, CO 80306
Tel: 303-823-9460
Fax: 303-823-8439
Picks up reusable items and delivers them to schools instead of the landfill. Items needed include office supplies, furniture, breakroom supplies, obsolete promotional materials, letterhead, envelopes, room dividers, file cabinets, computers and electronics. Tax-deductible. There is a \$40 fee for sizable quantities. Sponsored by Western Disposal.

Industrial Assessment Center

CSU Dept. of Mechanical Engineering
Engineering Industrial Assessment Center
Fort Collins, CO 80523
Tel: 970-491-7709
Fax: 970-491-3827
A free program for qualifying businesses (size dependent) to help manage energy and waste, and increase productivity.

Pollution Prevention Partnership

Contact: Paul Ferraro
1099 18th St.
Littleton, CO 80162-0082
Tel: 303-904-2177
Fax: 303-904-1278
A non-profit, voluntary alliance of businesses, government and public interest groups promoting pollution prevention in Colorado industries.

Resource 2000

Contact: Kurt Buss
6032 Butte Mill Road
Boulder, CO 80301
Tel: 303-441-3278
Fax: 303-441-4367
Accepts used building and construction material from demolition projects. Also assists businesses in the reuse and recycling of such material.

Southwest Public Recycling Association (SPRA)

P.O. Box 27210

Tucson, AZ 85726

Colorado Tel: 303-640-7497

Email correspondence to Jim Johnson at

jjohnson53@sprynet.com

A non-profit organization working to promote, strengthen and provide leadership in waste reduction, reuse, recycling and composting throughout the Rocky Mountain Southwest.

Waste Wise Region VIII

Contact: George Donnelly

Environmental Protection Agency

999 18th Street, Ste 500

Denver, CO 80202

Tel: 303-312-6193, 800-372-9473

Fax: 303-312-6741

www.epa.gov/wastewise

A national program which assists businesses in taking cost-effective actions to reduce solid waste.

Appendix G

SAMPLE RECYCLING MEMO TO ALL EMPLOYEES

The following is a sample memo to use to announce your recycling and waste reduction program to your employees. Fill in the blanks or customize to meet your needs.

TO: All employees
FROM: (Name of CEO)
DATE: (Insert date)
RE: Establishment of Recycling and Waste Reduction Program

(Name of company) is (initiating or revamping) a program designed to prevent waste and save money through reusing, recycling and avoiding as many waste materials as possible. Your participation is very important for the success of the program. Each of you, better than anyone else, knows where excess waste is produced and how it can be avoided in your department.

Undoubtedly, the success of this program will require minor changes in the daily habits of all of us. For instance, we can all reuse waste paper which is printed on one side only as scratch paper, rather than throwing it away. In addition to reducing waste, full participation in our company recycling program is essential. Work station containers for materials to be recycled will be located at (desktop, common areas). When these containers are full, maintenance staff will empty the contents into the central container nearest your desk. The locations of the central containers will be (list locations).

Please attend a short orientation session to learn more about how the program works. Three fifteen minute sessions have been scheduled for (dates). The sessions will start at (list times). Your supervisor has a sign up sheet.

Your participation will make a difference! For every pound of waste you reduce, reuse or recycle, you will:

- Save money for our company
- Protect the environment
- Save natural resources
- Conserve landfill space
- Reaffirm our company's support for environmental programs.

Please join me in an effort to trim down our waste and help our company get fit through participation in this program. I have appointed (name) as coordinator of waste minimization activities. If you have any questions, he/she can be reached at (phone #). Thank you for your cooperation and good luck!

(Signature of CEO)

Appendix H

SAMPLE RECYCLING 'WELCOME' MEMO TO NEW EMPLOYEES

DATE:

TO: (NEW EMPLOYEE NAME)

FROM: (ENVIRONMENTAL COORDINATOR NAME)

We take great strides to reduce, reuse, and recycle at (Company Name), and have so far been able to reduce our waste by at least (insert percentage) since (insert year). In addition to recycling cardboard, aluminum and steel cans, glass, and some plastics in the offices, we recycle most paper including phone books, magazines, and newspaper. The attached notice provides more details on what can and cannot be recycled.

The recycling container you have received is for your recyclable papers. You are responsible for emptying the container, as needed, into a recycling station usually located at (insert information). If you need an additional container for other materials (e.g. newspaper or cans) please feel free to contact me at extension (enter number).

Other points of interest:

- A newspaper collection container is located at (insert location). Tied or bagged newspapers are acceptable with recycled office paper, however. (if applicable with your recycling program)
- Aluminum can bins are located at (insert location). Please notify me if you need additional bins.
- We encourage reuse of office supplies such as file folders, dividers and inter-office envelopes. We also recycle printer and toner cartridges.
- If you have surplus new or used office supplies which could be utilized by other departments, please contact (insert contact here) about where to pickup or drop-off used office supplies.
- All cardboard can be recycled (insert location).
- We strongly encourage the use of non-disposable mugs, food containers, dishes and flatware for food and beverage consumption on the premises.

Please contact (insert contact name here) if you have any questions or suggestions. Employee ideas and suggestions are the key to a successful program. If you contribute a waste reduction idea which saves the company money, you will be recognized.

Welcome to the program. Thank you for helping us reduce our impact on the environment. Reduce, reuse, and recycle!

Sincerely,

(Environmental Coordinator's name)

Notes

eco-cycle

Community-Based Recycling

P.O. Box 19006
Boulder, CO 80308
303-444-6634
www.ecocycle.org

Printed on 100% Post-Consumer Recycled Paper