



PDHonline Course C318 (8 PDH)

Reducing Solid Waste

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Chapter Three

Selecting, Implementing, and Monitoring Waste Reduction Options

The information collected in the waste assessment now can be used to list, analyze, and choose appropriate waste reduction measures for your company. This chapter will help the team consider both the operational and the economic feasibility of the options under consideration, as well as the extent to which they will help achieve the goals of your waste reduction program. In addition, this chapter also discusses the process of implementing your program and monitoring it overtime to evaluate progress. The key steps of selecting, implementing, and monitoring waste reduction options are:

- ✓ *Compiling and screening the options*
- ✓ *Analyzing and selecting the options*
- ✓ *Implementing the options*
- ✓ *Educating and training employees*
- ✓ *Monitoring and evaluating the program*

Compiling and Screening the Options

Using the findings from the waste assessment, the team should list all the possible waste prevention, recycling, composting, materials exchange, and purchasing measures that it feels might be effective, using Worksheet E as a guide. This list should be compiled based on the goals of your waste reduction program. For example, if your company hopes to reduce waste removal costs as much as possible, and is charged for waste removal based on volume, the list of options should focus on high-volume waste materials. (Appendix A lists a number of waste reduction ideas.) Brainstorming sessions among team members can provide additional options.

Managers and employees that participated in the walk-through also can be consulted for more ideas, if necessary,

After all potential options have been identified, the team should screen them based on criteria such as whether the options will substantially reduce waste removal costs, reduce purchase costs, have low start-up costs, or are likely to boost employee morale. Companies may weigh these criteria differently based on the particular goals of their program. Use Worksheet E to screen all potential options against the criteria the team feels are important. This initial evaluation and screening will help you identify a subset of options that deserve further analysis and possible inclusion in your waste reduction program.

Analyzing and Selecting the Options

Once a short list of waste reduction options has been identified, the team should begin the process of deciding which options are the most appropriate for your program. Worksheet F provides a set of decision-making criteria to help lead the team through the evaluation process. At the end of Worksheet F, the benefits and drawbacks of each option under consideration can be summarized.

During this evaluation process, the team should be clear on the relative importance of the different criteria against which the options are being measured. Depending on your company's waste reduction goals, for example, cost-effectiveness may not always be the overriding criteria for selected options. Other criteria, such as improved environmental awareness, employee morale, and community relations, may be equally important. In

When Evaluating Your Options...

It is important that the waste reduction team thoroughly review the potential effects of each waste prevention, recycling, composting, and purchasing option. While a strong consideration is likely to be whether the option's costs are justified by potential savings, the waste reduction team also should consider:

- *Effects on product or service quality and product marketing*
- *Compatibility with existing operations*
- *Equipment requirements*
- *Space and storage requirements*
- *Operation and maintenance requirements*
- *Staffing, training, and education requirements*
- *Implementation time*
- *Effects on employee morale, environmental awareness, and community relations*

addition, teams whose companies feel cost-effectiveness must be a key criteria should be sure to consider the long-term economic feasibility of an option. While the team may be inclined to disregard a particular option with large start-up costs, the measure may end up yielding impressive savings over several years. Worksheet F contains a formula for calculating an option's payback period, which is one way of measuring the long-term economic feasibility of a proposed investment. Your company may use other such measuring tools.

In addition, after completing the evaluation of these options, review the long-term feasibility of the program as a whole. Successful programs can be designed around complementary options that take advantage of their different strengths. Before removing any items from consideration, for example, consider whether certain waste reduction efforts may, over time, save enough money to pay for other waste reduction activities that improve environmental awareness, employee morale, or community and customer relations,

Some options might not require extensive analysis. For example, if your facility already has a copy machine with the ability to make two-sided copies efficiently, then a policy mandating double-sided copying usually can be implemented

easily. On the other hand, you will want to carefully analyze complex options that require a significant change in operations or large capital investments. For instance, a food service considering a switch from disposable to reusable serveware needs to assess factors ranging from the cost of new equipment and added labor expenses to the savings from reduced waste removal costs and the avoided purchase of disposable serveware. The health and sanitation aspects of such a switch also should be considered. For complex options, the team will want to contact suppliers, product refurbishers, packaging designers, and any other individuals who could help determine if the option is feasible. These individuals also can help pinpoint any unforeseen obstacles or complications that could hinder implementation,

Waste Prevention Options

When analyzing and selecting specific options, team members should focus first on waste prevention, which will enable your company to eliminate some of its waste. After studying your company's waste generation and management practices, you will likely have compiled a number of waste prevention options. Use Worksheet F to determine the capital and operating costs of these options and compare them against potential

savings and revenues. Be sure to examine the potential operational effects, as well. For example, while modifying packaging can significantly reduce waste, you will want to consider carefully how these changes will affect storage, operations, and labor costs.

One waste prevention option may result in savings in several different areas, including avoided purchasing, storage, materials handling, and removal costs. For example, switching to double-sided copying can result in cost savings associated with reduced paper purchasing, reduced space necessary for paper storage, reduced employee time associated with handling paper and filling paper trays, and reduced paper packaging removal costs. Be sure to consider savings in each of these areas when evaluating waste reduction options.

Recycling Options

Next, evaluate the recycling options the team has identified to better manage waste that cannot be prevented. Before implementing any recycling option, the team needs to consider the marketability of the materials to be collected. To locate potential buyers, contact local recycling companies. Consult the Yellow Pages (under “recycling”), trade associations, chambers of commerce, and state or local government recycling offices for assistance. When conducting preliminary contract discussions with local buyers and haulers, there are a number of questions you should ask. The box on the following page provides a starting point. Appendix E provides information on the types of materials that commonly are collected for recycling.

Be sure to carefully weigh the cost-effectiveness and potential operational effects of your recycling options. Recycling programs, especially more ambitious efforts, often require purchases of equipment like containers, compactors, and balers. Additional labor also might be required. Moreover, steps might be necessary to ensure that contamination of collected materials is minimized. Some companies also may have to pay a fee to have their collected recyclable material removed. In many cases, however, the savings and revenues (such as reduced removal costs and revenues from selling collected materials) will offset these costs. In addition,

consider whether the new recycling program will affect current purchasing practices. For instance, your company might want to begin buying exclusively white legal pads instead of yellow ones to take advantage of the strong market for white office paper. Also examine the extent to which internal collection, transfer, and storage systems are needed and whether these new systems will be compatible with existing operations.

Composting Options

If the team discovers that yard trimmings or other organic matter make up a significant percentage of your company’s waste, evaluate the feasibility of “grasscycling” or composting. Most companies can benefit by “grasscycling” — leaving cut grass on the lawn where it will decompose quickly and help add nutrients that improve the quality of the lawn. Though not necessary, a mulching mower can cut the grass clippings into smaller pieces, allowing them to decompose more quickly. Your company will save time and money by no longer bagging the clippings, and will reduce its disposal fees,

If your company has available outdoor space, onsite composting can be used. Companies with composting programs usually find them to be a cost-effective method for turning lawn trimmings into a product that may then be sold or used on company grounds. The team can design a program to collect all types of organic materials into piles for composting, or a simpler program designed to compost just yard trimmings might be used. If the local municipal government operates or participates in a composting project, offsite composting also may be an option. A program can be designed to collect and store organic materials and, if necessary, haul it to the composting facility. Even when hauling is necessary, however, these programs also tend to be cost-effective.

To determine if composting is appropriate for your company’s waste reduction program, it is important to calculate likely startup and ongoing expenses against projected savings at the outset. Worksheet F will help the team estimate likely costs, including training groundskeeping staff in compost management, educating company employees about participating in the program, equipment and operating cost, and compare

Questions to Ask Potential Buyers of Recyclables

When meeting with recycling companies interested in purchasing your collected materials, there are a number of issues you should discuss, including:

- **What types of recyclables will the company and how must they be prepared?** Recycling companies might request that the material be baled, compacted, shredded, granulated, or loose. Generally, recyclers will offer a better price for compacted or baled material. Compacting or densifying materials before transporting also can be a cost-effective method of lowering hauling costs for the buyer.
- **What contract terms will the buyer require?** Discuss the length of the potential contract with the buyer. Shorter contracts provide greater flexibility to take advantage of rising prices, while longer contracts provide more security in an unsteady market. Often, buyers favor long-term contracts to help ensure a consistent supply of materials. The terms of payment should be discussed as well, since some buyers pay after delivery of each load, while others setup a periodic schedule. Also, ask whether the buyer would be willing to allow changes to the contract over time. The buyer might want some flexibility as well; in many cases, the buyer will be willing to pay a higher rate in return for a stable supply of quality materials.
- **Who provides transportation?** If transportation services are not provided by the buyer, you will need to locate a hauler to transport materials to the buyer. The Yellow Pages, local waste haulers, and state or local waste management authorities can help provide this information.
- **What is the schedule of collections?** If the recycling company offers to provide transportation, check on the frequency of collections. Some businesses might prefer to have the hauler be on call, picking up recyclable when a certain weight or volume has been reached. Larger companies might generate enough recyclable material to warrant a set schedule of collections.
- **What are the maximum allowable contaminant levels and what is the procedure for dealing with rejected loads?** Inquire what the buyer has established as maximum allowable levels for food, chemicals, or other contaminants. If these requirements are not met, the buyer might reject a contaminated load and send it back to your company. The buyer also might dispose of a contaminated load in a landfill or combustor which can result in your company incurring additional costs.
- **Are there minimum quantity requirements?** Find out whether the buyer requires a minimum weight or volume before accepting delivery. If a buyer's minimum quantity requirements are difficult to meet, consider working with neighboring offices or retail spaces. By working together it might be possible to collect recyclables in central storage containers and thereby meet the buyer's requirements.
- **Where will the waste be weighed?** Ask where the material will be weighed, and at what point copies of the weight slips will be available. Weighing the material before it is transported will eliminate the problem of lost weight slips and confirm the accuracy of the weight recorded by the buyer.
- **Who will provide containers for recyclables?** Buyers should be asked whether they will provide containers in which to collect, store, and transport the material, and whether there is a fee for this service.
- **Can "escape clauses" be included in the contract?** Such clauses establish the right of a company to be released from the terms of the contract under conditions of noncompliance by the buyer.
- **Be sure to check references!** Obtain and thoroughly check the buyer's references with existing contract holders, asking these companies specifically whether their buyer is fulfilling all contract specifications.

these against projected savings' in waste removal costs and the potential for selling the compost or using it on site in place of commercial mulch.

In addition to grasscycling and composting, other practices can reduce yard trimmings at your facility and should be considered by the team. The team can investigate the possibility of chipping other ground debris, like branches, into mulch. The mulch can be used on company property to reduce weeds and conserve moisture around plantings. Other options include planting low maintenance plants. Slow-growing species and evergreen trees generally do not create large amounts of debris.

Purchasing Options

During the waste assessment, the team may have noted purchasing changes that could help reduce waste, from buying supplies with reduced packaging to careful inventory control to avoid overordering and possibly throwing away perishable items. In addition, during the team's exploration of local recycling markets, the need for favoring products made with recycled content also may have become evident. In any business, many opportunities exist to use the company's buying power to reduce waste and encourage the growth of recycling markets. To identify specific changes in purchasing that your company could adopt, the team might contact its suppliers and discuss alternative products that would meet the new purchasing criteria. Check with other suppliers, as well, to see what they may be able to offer. In addition, various industry groups, state solid waste agencies, and federal information services such as EPA's RCRA Hotline can help identify ways to reduce waste through product purchasing and sources of products made from recycled materials.

After you have identified opportunities to purchase recycled products and products that can help you reduce waste, each item should be evaluated in terms of availability and cost. Reduced waste and recycled products do not necessarily cost more than other products. For example, while paper made from recycled fibers was once considerably more expensive than virgin paper, the price of paper with recovered content today is competitive with traditional paper. In addition, be sure to compare recycled or reduced waste products to

other products on the basis of long-term costs, rather than purchasing costs alone. For example, while benches and picnic tables made from recycled plastic may initially cost more than their wooden counterparts, they last up to four times longer and do not require maintenance. Similarly, while reusable products may cost more to purchase initially, they often save money over time by avoiding frequent purchases of single-use items.

Implementing the Options

Having determined the initial waste reduction measures to adopt, the team should now begin to implement the measures. Consider building your program slowly, implementing a few options at a time, so employees are not overwhelmed by changes in procedure. This is particularly important for more complex waste reduction programs. Building slowly also provides an opportunity to identify, assess, and solve any operational problems in the early stages. If a program involves only a few simple measures, however, it might be possible to implement all options at once.

Educating and Training Employees

As the team begins to implement the waste reduction program, it is essential that all employees be informed about the program and the importance of their cooperation and involvement. Be sure to update employees regarding the options being implemented, changes in work patterns or equipment, expected benefits, and their roles and responsibilities. These messages can be conveyed in a variety of ways, including:

- Staff meetings and training sessions.
- Employee newsletters
- Posters, signs, or flyers.
- Notices on electronic mail.
- Special events, such as slogan contests, cash awards, or other recognition for waste reduction activities.
- New employee orientation.
- Job performance standards.

Some companies can effectively reach all their employees by circulating memos or holding informal meetings. Larger businesses might need to conduct a full-scale education or training campaign to be sure their entire company is aware of and involved in the program.

These outreach techniques also should be used to keep staff up-to-date on the program's successes and problems. Employees will feel a greater stake in the program if they receive frequent

updates on the quantity of waste being reduced, reused, or recycled; the recycled products being purchased; and the cost savings that have resulted. These reports also might impress management, increasing their commitment to the program.

Another method of sustaining employee interest is to encourage them to submit new ideas for increasing the efficiency of company operations. You also might consider asking employees to help

Encourage Employee Participation

In 1990, the independently owned and operated Boston Park Plaza Hotel& Towers expanded its modest white paper recycling initiative into a comprehensive environmental program that includes waste prevention, recycling, energy and water conservation, as well as education and communications. Recognizing that the effort's success depended on widespread employee support, management launched the program with a formal "Environmental Policy" statement signed by the president and the environmental program director. A copy of the statement was distributed in three languages-English, Spanish, and French-to all 600 employees, and was framed and posted in each department at the 977-room hotel.

The next step was to develop an ongoing effort to increase employee participation. The management at The Boston Park Plaza quickly learned that regular communication with individual employees-on the phone or one-on-one kept the staff informed about the program and encouraged them to suggest improvements. The hotel adopted many other outreach methods, including:

- **Holding regular "Green Team" meetings.** Representatives from different departments meet monthly to discuss possible program changes. Green Team members also encourage fellow employees to participate in the program.
- **Holding monthly company-wide "Green Day" luncheons.** At lunchtime on the third Thursday of every month, the company celebrates Green Day. In the employee cafeteria, educational displays are setup and a raffle is held to give away prizes, such as canvas tote bags, plants, and water-saving devices.
- **Publicizing program changes and achievements in the company newsletter.** Articles highlight employees' efforts, press coverage of the program, and basic operations and changes.
- **Announcing special happenings in memos and paycheck stuffers.** When the hotel's program receives outstanding recognition, such as the President's Environment and Conservation Challenge Award that it won in 1992, employees get a memo from the hotel president thanking them for their assistance and support.
- **Rewinding employees for program involvement.** Once a year, the most dedicated employees are awarded a small gift and a framed certificate praising them for their involvement.

In addition to attracting national attention, The Boston Park Plaza Hotel has proved that even a luxury hotel can "reduce, reuse, and recycle" without sacrificing quality. In fact, since the program was launched, hotel executives estimate having generated more than \$750,000 in new convention business due to clients' desire to support this environmentally conscious establishment.

with program implementation. These employees could notify program coordinators or monitors when recycling containers are full or oversee waste reduction measures such as double-sided copying in their department to ensure that everyone understands and complies with the policy.

Monitoring and Evaluating the Program

Waste reduction is a dynamic process. Once the program is underway, the team will need to evaluate its effectiveness to see if preliminary goals are being met. In addition, once the potential for reducing waste in the company becomes better understood, consider establishing long-term goals for the program. It is important to evaluate the program periodically to:

- Keep track of program success and to build on that success (e.g., waste reduced, recycling rates achieved, money saved).
- Identify new ideas for waste reduction.
- Identify areas needing improvement,
- Document compliance with state or local regulations,
- Determine the effect of any new additions to the program.
- Keep employees informed and motivated.

The best way to assess and monitor program operations is through continued documentation. Use Worksheet G to help analyze and record the effectiveness of your waste reduction program over time. Perform your first evaluation after the program has been in place long enough to have an effect on your company's waste generation rate, usually about one year. In addition, it might be worthwhile to conduct additional periodic waste assessments to determine further changes in your company's waste. If an assessment already has been performed, subsequent ones will be much easier to conduct. Consider reviewing as well your company's waste removal receipts and purchasing records (look back at your target items), or preparing a summary of recycling receipts and waste assessment worksheets.

Waste Reduction in Your Workplace and Beyond

Many companies are finding that waste reduction makes economic and environmental sense. By working with other employees in your company as a team, you can devise and implement a successful waste reduction program. Not only can such a program look good on the bottom line, but it also can reflect well on your company!

Waste reduction isn't something you have to leave at the job, either. Spread the message to "reduce, reuse, and recycle" at home and in your community, too!