

S.C. Collegiate Recycling Professionals Certification

Reference Guide 2018-2020

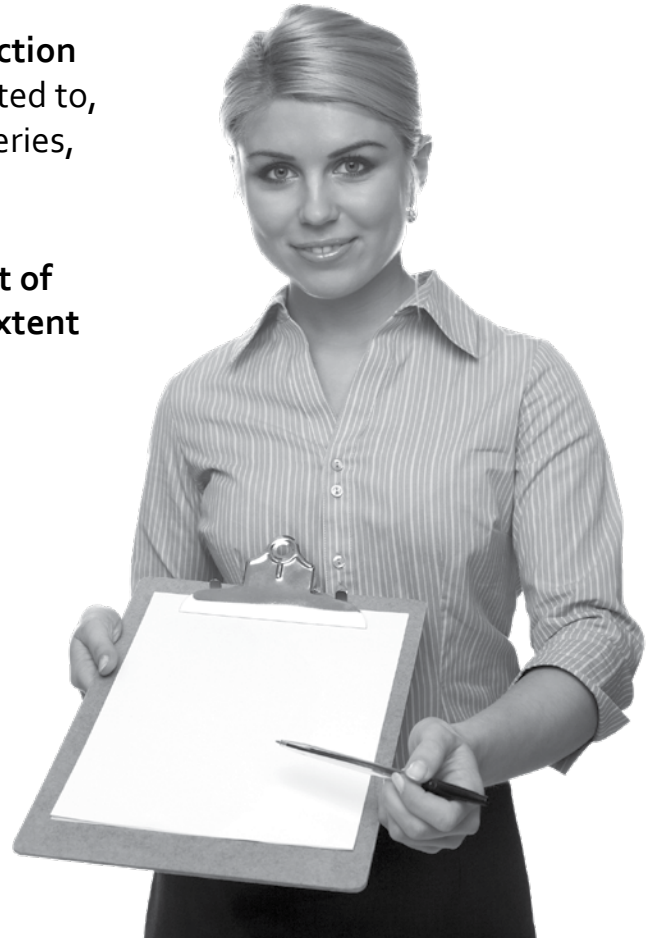


Requirements

NOTICE

The following are **recycling requirements for state-supported colleges/universities** per the S.C. Solid Waste Policy and Management Act of 1991 (Act) – S.C. Code of Laws §§ 44-96-10 et seq.:

- **Establish recycling programs for the collection of selected material** including, but not limited to, aluminum, cardboard, glass, lead-acid batteries, paper, plastic, tires and used motor oil;
- **Establish a program to reduce the amount of solid waste generated to the maximum extent possible;** and
- **Report the type and amount of material recycled and all products purchased containing recycled-content material by September 15 of each year to the S.C. Department of Health and Environmental Control (DHEC).** The Act sets a goal that at least 25 percent of all product purchases contain recycled-content material.



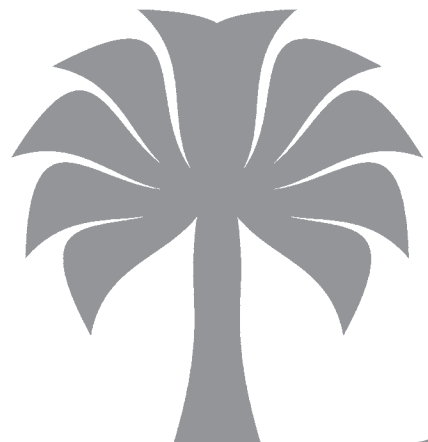
About the Manual

"The S.C. Collegiate Recycling Professionals Certification Training Manual for 2018-2020" is published by DHEC's Office of Solid Waste Reduction and Recycling.

Editor: Adah Gorton

Layout/Artwork: Gregg Glymph

This edition was published in November 2018.



Contents

CHAPTER 1: The Basics of Recycling.....3

CHAPTER 2: Developing, Implementing & Improving College/University Recycling Programs9

CHAPTER 3: Education & Promotion.....19

CHAPTER 4: Managing Organics25

CHAPTER 5: Food Waste Reduction & Recovery..... 31

CHAPTER 6: Managing Banned Items39

CHAPTER 7: Managing Miscellaneous Items.....45

CHAPTER 8: Managing Construction & Demolition Debris..... 51

CHAPTER 9: Greening Collegiate Sports.....59

CHAPTER 10: Effective Contracting & Marketing.....69

CHAPTER 11: Recordkeeping & Reporting 77

CHAPTER 12: Environmentally Preferred Purchasing83

CHAPTER 13: Resources 87

List of Resources

WORKSHEET A: Selecting Vendors for Recycled-Content Products Worksheet88

WORKSHEET B: Tracking Recycled-Content Purchases Worksheet88

WORKSHEET C: Conducting a Waste Audit89

WORKSHEET D: Records Review – Current Waste Management Costs93

WORKSHEET E: Interviewing Recycling Service Providers95

WORKSHEET F: Calculating Avoided Disposal Costs & Net Costs of a Recycling Program97

WORKSHEET G: Recycling Awareness Survey100

S.C. Environmentally Preferred Purchasing Policy101

For Collegiate Recycling Programs

Colleges/universities have a unique opportunity to improve the community and help South Carolina achieve its recycling goals. The S.C. Department of Health and Environmental Control’s Office of Solid Waste Reduction and Recycling (Office) provides assistance in establishing and enhancing recycling on college/university campuses.

Through its Recycle U program, the Office offers free, non-regulatory services including:

- Site visits to assess waste reduction, reuse and recycling successes and opportunities;
- Technical assistance including phone/email consultations, research and contacts for potential markets, service providers and beneficial reuse; and
- The S.C. Collegiate Recycling Professionals Certification and other workshops.

In addition, the Office supplies promotional artwork that can be customized for use on your campus as well as Recycle Guys costumes for use at events.

For more information or to schedule a site visit, call **1-800-768-7348**.



The Basics of Recycling

CHAPTER 1

How much MSW is generated in South Carolina?

Each year, the S.C. Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling (Office) publishes "The S.C. Solid Waste Management Annual Report" for the previous fiscal year (FY) – July 1 through June 30. This report provides the amount and type of solid waste disposed of and detailed information on the amount of material recycled by commodity.

South Carolinians generated more than 4.6 million tons of MSW in FY17 according to this report. Nationwide, Americans generated about 262 million tons of MSW in 2015 according to the U.S. Environmental Protection Agency's (EPA) most recent Advancing Sustainable Material Management report.

South Carolinians disposed of 3.6 pounds of MSW per person per day (p/p/d) in FY17. The national average for disposal was 2.3 p/p/d in 2015 according to EPA.



Definition

Municipal Solid Waste (MSW) in South Carolina is defined as the combined residential, commercial, institutional/non-profit and industrial packaging/office waste generated. This includes paper, cans, bottles, food waste, yard trimmings, packaging and other items.

It does NOT include the following:

- **Industrial waste** like scraps and by-products from manufacturing;
- **Construction and demolition (C&D) debris;**
- **Automobile bodies;**
- **Agricultural waste;**
- **Land-clearing debris;**
- **Combustion ash;**
- **Mining waste;**
- **Sewage sludge; or**
- **Hazardous, infectious and radioactive waste.**

In South Carolina, MSW typically represents about 33 percent of total solid waste generated.

Waste Management Hierarchy

Because no single approach is suitable for managing all waste streams, EPA developed a hierarchy ranking environmentally sound strategies for managing MSW. The hierarchy is shown in Figure 1.1. Remember:

- **Source reduction** is preventing waste before it happens; and
- **Reuse** is to use again.

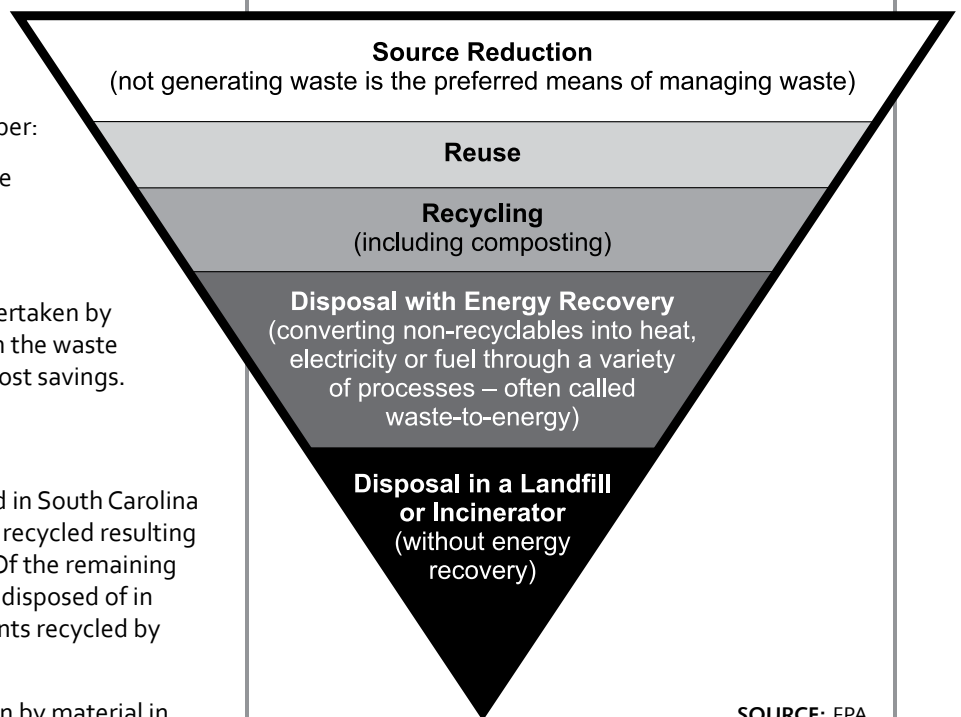
Waste reduction and reuse activities undertaken by state agencies can have a large impact on the waste stream and also can result in significant cost savings.

Where does MSW go?

Of the 4.6 million tons of MSW generated in South Carolina for FY17, more than 1.3 million tons were recycled resulting in a MSW recycling rate of 28.7 percent. Of the remaining amount, more than 3.2 million tons were disposed of in MSW landfills. Chart 1.2 shows the amounts recycled by commodity.

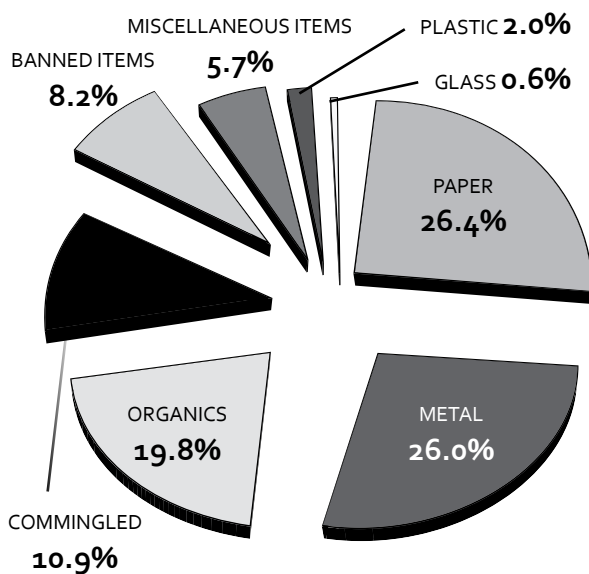
Chart 1.3 shows the total MSW generation by material in the United States for 2015.

FIGURE 1.1: Waste Management Hierarchy



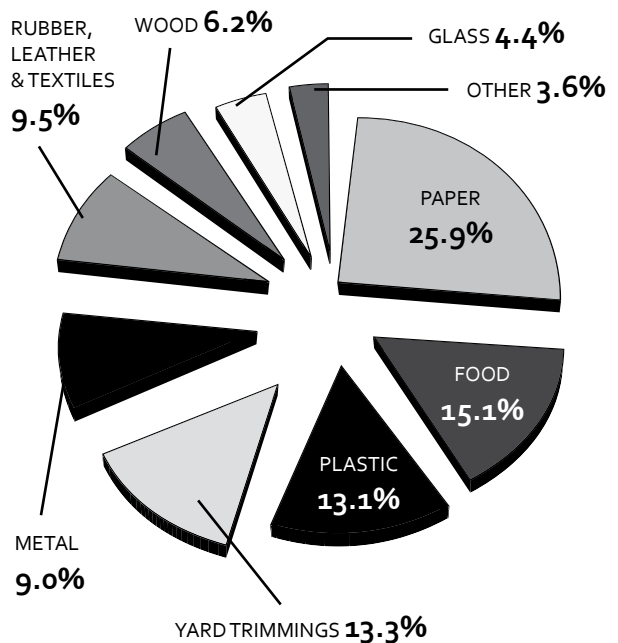
SOURCE: EPA

CHART 1.2: MSW Commodities Recycled as a Percentage of All MSW Recycled in South Carolina for FY17



*NOTES: Commodities are measured by weight. Percentages do not equal 100 percent due to rounding.

CHART 1.3: MSW Generation by Material in the United States for 2015



SOURCE: EPA

Why recycle?

Recycling has many environmental, economic and social benefits.

- **Recycling has significant economic benefits.** The recycling industry has a \$13 billion annual impact on the state's economy and is directly responsible for 22,403 jobs, \$329 million in state and local tax revenue each year and \$2.7 billion in annual personal income.
- **Recyclables have value.**
- **Recycling can be cost competitive with disposal or incineration.**
- **Recycling helps reduce greenhouse gas emissions** including major amounts of methane produced by landfills and incinerators.
- **Recycling saves energy.** Less energy is needed to process recovered material than to extract, transport and process virgin material. This reduces the burning of fossil fuels and prevents pollution.
- **Recycling reduces litter.** As much as 75 percent of litter is material that can be recycled.

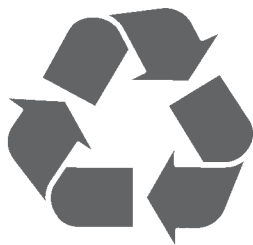
Definition

What is recycling?

According to EPA, recycling is the series of activities by which material that is no longer useful to the generator is collected, sorted, processed and converted into raw material and used in the production of new products.

Although people often think of recycling as the act of sorting material from solid waste and placing it in a separate container for pick up, recycling only occurs when all of the following steps are completed:

1. **Collection of items** that would otherwise be considered waste (includes transportation to market);
2. **Processing and remanufacturing** the recycled raw material into new products; and
3. **Buying recycled products.**



- **Recycling slows the harvest of trees and saves other natural resources.** For example, when one ton of steel is recycled, 2,500 pounds of iron ore, 1,400 pounds of coal and 120 pounds of limestone are conserved.
- **Recycling stimulates the development of green technology,** which creates jobs.
- **Recycling contributes to a sustainable future.**

The S.C. Solid Waste Policy and Management Act of 1991

South Carolina passed its first comprehensive law regarding the management of solid waste in May 1991. Major requirements of the S.C. Solid Waste Policy and Management Act of 1991 (Act) – S.C. Code of Laws §§ 44-96-10 et seq. – include the following.

- **The Act requires state agencies and state-supported colleges/universities to establish recycling programs** for at least the following material: aluminum, cardboard, glass, lead-acid batteries, paper, plastic, tires and used motor oil.
- **The Act established DHEC's Office of Solid Waste Reduction and Recycling** (Office) and charged the Office with providing:
 - **Technical assistance;**
 - **Educational and awareness programs** to local governments, businesses, colleges/universities, schools and the public regarding solid waste and recycling issues; and
 - **Grant funding:** The Office is responsible for five recycling grant programs. Grants are funded by advanced recycling fees on white goods (large appliances), lead-acid batteries, tires and motor oil and are available to counties, municipalities and regions as well as schools and colleges/universities. In FY18, about \$155,000 in grant funds were awarded to colleges/universities.

The Office serves solely as a resource to assist such stakeholders and has no regulatory, compliance or enforcement role.

- **The Act requires state-supported colleges/universities to report to DHEC the amount of MSW recycled annually.** DHEC sends each college/university an annual Recycling and Buying Recycled Progress Report Survey that solicits information about waste reduction, recycling and green purchasing efforts on campus.
- **The Act bans certain material from MSW landfill disposal** including large appliances, lead-acid batteries, used motor oil, used oil filters, waste

tires (whole) and yard trimmings. In addition, South Carolina passed electronics legislation (S.C. Code of Laws §§ 48-60-05 et seq.) in 2010 that banned the disposal of specific electronics (consumer-generated televisions, computers, computer monitors and printers) in solid waste landfills.

The Act's Waste Reduction & Recycling Goals

The Act established a statewide recycling goal of 25 percent and a waste reduction goal (reducing the amount

of waste going to landfills and incinerators) of 30 percent. These goals were updated in 2000 and again in 2011. The latest recycling goal is 40 percent of the MSW stream with a target date of June 30, 2020. The waste reduction goal is a per-capita disposal goal of 3.25 pounds of MSW per person per day (p/p/d) and also has a target date of June 30, 2020.

In FY17, South Carolina's recycling rate was 28.7 percent, with a disposal rate of 3.6 p/p/d. Table 1.4 on page 7 shows the amount of MSW recycled in tons from FY13 through FY17. In comparison, Table 1.6 shows the amount of MSW disposed of in tons from FY13 through FY17.

RecycleMoreSC Campaign helps brand recycling in South Carolina

The RecycleMoreSC campaign is designed to reinvigorate recycling in South Carolina by:

- Promoting the economic and environmental benefits of recycling;
- Providing tools to local governments to present a clear, consistent message across the state; and
- Challenging residents, businesses and others to do their part and recycle more.

The campaign is the centerpiece effort of the 40by2020 Partnership. The partnership is a group of public and private stakeholders dedicated to sharing knowledge, coordinating resources and working together to help South Carolina meet or exceed its 40 percent recycling goal set for 2020.

The partnership includes Pratt Industries, Sonoco Recycling, the S.C. Beverage Association, PalmettoPride, the S.C. Department of Commerce and DHEC.

Learn more at www.recyclemore.org.



What is TSW?

Total solid waste (TSW) is all the solid waste that South Carolinians generate. TSW includes MSW as well as C&D debris, exported solid waste, biosolids, land-clearing debris, agricultural waste, automobile bodies and industrial solid waste.

The amount of TSW generated in South Carolina in FY17 was about 14 million tons. Of this amount, more than 9.3 million tons were disposed of in landfills. Almost 4.7 million tons, or 33.8 percent, were recycled.

Table 1.5 shows the amount of TSW recycled from FY13 through FY17. Table 1.7 shows the amount of TSW disposed of from FY13 through FY17.

TSW provides a much more comprehensive look at how much waste is generated, disposed of and recycled.

Recycling is part of a bigger picture.

Across the United States collegiate leaders are working toward sustainability through campus operations, engaging students via learning and outreach and working with local communities.

Sustainability means providing for current needs without sacrificing the needs of future generations. It can be incorporated and achieved in many ways on a college campus, from installing water refill stations to providing alternative forms of transportation (e.g., bicycles).

Waste reduction, recycling and food waste recovery also play an integral role in sustainability initiatives on campus. Given that, recycling professionals should be involved in the planning and implementation of sustainable practices. Listed below are several initiatives that are part of college/university sustainability discussions.

- **Product Stewardship**
 - Everyone involved in the product life cycle – manufacturers, retailers and consumers – share responsibility for reducing the environmental impact of products.
 - Manufacturers are encouraged to design products that require less harmful and recycled material, and to reuse and recycle whenever possible.
 - Retailers and consumers, including colleges/universities, are asked to take an active role in the proper management or recycling of products.
 - For more information about product stewardship, please see The Product Stewardship Institute at www.productstewardship.us.

- **Environmentally Preferred Purchasing (EPP)**

- EPP is the procurement of products and services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose.
- Products may be purchased based on many factors, including recycled content, lower

TABLE 1.4: S.C. MSW Recycled by FY

FISCAL YEAR	RECYCLED IN TONS	RECYCLING RATE BY PERCENT	RECYCLED IN P/P/D
2013	1,371,960	31.5%	1.6
2014	1,263,495	29.2%	1.4
2015	1,101,190	26.5%	1.3
2016	1,094,569	25.4%	1.2
2017	1,325,823	28.7%	1.5

TABLE 1.5: S.C. TSW Recycled by FY

FISCAL YEAR	RECYCLED IN TONS	RECYCLING RATE BY PERCENT	RECYCLED IN P/P/D
2013	7,700,976	49.3%	8.9
2014	6,030,557	43.2%	6.9
2015	2,974,363	26.3%	3.4
2016	2,788,140	25.0%	3.1
2017	4,701,301	33.8%	5.2

TABLE 1.6: S.C. MSW Disposed of by FY

FISCAL YEAR	DISPOSED OF IN TONS	DISPOSED OF IN P/P/D
2013	2,985,852	3.5
2014	3,067,942	3.5
2015	3,058,388	3.5
2016	3,213,592	3.6
2017	3,295,360	3.6

TABLE 1.7: S.C. TSW Disposed of by FY

FISCAL YEAR	DISPOSED OF IN TONS	DISPOSED OF IN P/P/D
2013	7,906,522	9.2
2014	7,918,780	9.1
2015	8,317,621	9.4
2016	8,376,283	9.4
2017	9,383,681	10.4

or no toxicity, bulk packaging, lower energy consumption and whether they are locally manufactured/ supplied.

South Carolina's EPP policy is discussed in Chapter 12.

- **Green Building**

- Green or sustainable building is the practice of creating healthier and more resource-efficient models of building construction, renovation, operation, maintenance and demolition.
- Research shows that buildings designed and operated with life-cycle impacts in mind (e.g., design, construction, operation, demolition, waste treatment) provide environmental, economic and social benefits.

Green building is discussed in Chapter 8.

- **Zero Waste**

- A comprehensive approach to waste management with the ultimate goal of eliminating all waste and any emissions to the air, soil and water.
- Recycling plays a key role in any zero waste approach.
- The concept may sound visionary, but the philosophy is that all material is a future resource – not waste.

Information about zero waste as part of greening sports events is provided in Chapter 9.

- **Litter Prevention**

- Being aware of how products and packaging are managed at the end of their useful lives prevents litter.
- Accessible, convenient recycling locations and overall environmental awareness reduce litter.

To learn more about litter prevention in South Carolina, visit www.palmettopride.org.

Outreach and education, as always, are key to making things work. Equipping faculty, staff and students with the tools, knowledge, motivation and opportunities to promote sustainability is an essential activity of a sustainable campus.

DHEC's College/University Recycling Grant Program

Funded by a two-cents-per-quart fee on motor oil, DHEC offers grants to public and private colleges/ universities to fund solid waste reduction and recycling activities. Depending on which grant is awarded to a college/university, it can be used for:

- Equipment (e.g., roll-off containers, twin bins);
- Professional development including workshops, conferences and certification programs;
- Developing and expanding programs; and
- Other solid waste reduction and recycling activities.

Use and availability of grants vary each year. Please visit www.scdhec.gov/HomeAndEnvironment/Recycling/GrantsforCollegesUniversities/ for more information.

References & Resources for Chapter 1

- "Advancing Sustainable Material Management: 2015 Fact Sheet," www.epa.gov/sites/production/files/2018-07/documents/2015_smm_msw_factsheet_07242018_fnl_508_002.pdf
- S.C. Code of Laws, Title 44, Chapter 96, S.C. Solid Waste Policy and Management Act of 1991, www.scstatehouse.gov/code/t44c096.php
- S.C. Code of Laws, Title 48, Chapter 60, South Carolina Manufacturer Responsibility and Consumer Convenience Information Technology Equipment Collection and Recovery Act, www.scstatehouse.gov/code/t48c060.php
- "S.C. Solid Waste Management Annual Report for FY17," www.scdhec.gov/sites/default/files/Library/OR-1644.pdf
- "The Economic Impact of the Recycling Industry in South Carolina," 2014, www.scdhec.gov/library/CR-011380.pdf

Developing, Implementing & Improving College/University Recycling Programs

Conduct Research

Prior to setting up or expanding a recycling program, certain topics should be researched.

STATE AND LOCAL LAWS AND POLICIES

An understanding of applicable state and local solid waste and recycling laws and policies is essential to developing a college/university recycling program. The S.C. Solid Waste Policy and Management Act (Act) of 1991 has specific requirements for state-supported colleges/universities. See Chapter 1 for details.

In addition to state laws and policies, contact the municipal and/or county government in which the college/university is located to learn about local recycling laws and policies.

COLLEGE/UNIVERSITY POLICIES

Many colleges/universities also have policies regarding solid waste management and recycling. Often, these policies are part of a broader sustainability plan or goal.

Questions to assist with identifying potential policies impacting solid waste management and recycling on campus should include the following.

- Does the college/university mission statement include a commitment to sustainability or developing a sustainability plan?
- Is there a green building policy that requires recycling for construction and demolition projects?
- Are campus buildings and events required to have recycling programs and/or containers?

THE CURRENT AND POTENTIAL SOLID WASTE MANAGEMENT SYSTEM

Researching the current and potential solid waste management systems may require interviews and site visits as well as conducting waste audits.

When conducting interviews it is important to gather information from representatives of facilities management, purchasing/finance, student housing, food services, environmental programs (including student organizations), athletics, event coordinators and any other departments that play a role in waste creation or management as well as recycling professionals from other colleges/universities.

What items are typically recycled?

Most college/university recycling programs include at least the following material:

- Cardboard;
- Office paper and/or mixed paper;
- Newspapers, telephone books and magazines;
- PET (#1) and HDPE (#2) bottles, jars and jugs;
- Aluminum and steel/tin cans; and
- Inkjet/toner cartridges.



'Recycling and Beyond: A College Campus Primer'

This guidebook – written by Christine von Kolnitz Cooley, Medical University of South Carolina, and Karyn Kaplan, University of Oregon – provides an overview of strategies for implementation and development of college/university recycling programs. It provides tools, resources and success stories to inspire collegiate recyclers everywhere.

To view the guidebook, visit http://curc3r.org/wp-content/uploads/2017/10/Recycling_and_Beyond_College_Campus_Primer.pdf.

Table 2.1 provides examples of the types of information that can be obtained from various stakeholders.

Note that depending on the college/university, different departments may be involved in certain tasks.

Develop a recycling program proposal.

The next step is to design a new or expanded recycling program proposal to present to college/university leadership.

WHAT MATERIAL SHOULD BE INCLUDED IN THE RECYCLING PROGRAM?

When deciding what material should be included in a recycling program or what to target first, there are several questions to consider. Here are a few examples to begin the process.

- **What material is generated in large quantities? Where is it generated?**

- **Is there toxic or difficult-to-manage material generated on campus that could potentially be recycled or reused** (e.g., paint)?
- **Could waste reduction or reuse programs be implemented in place of recycling programs for certain material** (e.g., double-sided printing)?
- **Is some material only generated at specific events or locations on campus?** If so, which ones and where?
- **Does some material have the potential to generate revenue?**
- **Are there no-cost recycling programs offered by third parties that could address some recycling needs** (e.g., rechargeable batteries)?

Banned and difficult-to-manage material are discussed in more detail in Chapters 6 and 7.

While it is possible to start a recycling program with some material and add more later, it is important to plan for

TYPE OF INFORMATION	POTENTIAL STAKEHOLDERS TO INTERVIEW
Cost of Current Recycling and Waste Collection and Disposal Program	<ul style="list-style-type: none"> • Environmental Services Department • Department of General Services • Purchasing/Finance Department
Tonnage Disposed of and Recovered	<ul style="list-style-type: none"> • Environmental Services Department • Recycling Service Provider • Waste Collection Service Provider
Types and Sources of Material Generated on Campus	<ul style="list-style-type: none"> • Facilities Department • Environmental Services Department • Food Services Department/Food Contractors • On-Campus Event Coordinators
Potential Material (that can be included in recycling program and potential vendors)	<ul style="list-style-type: none"> • Environmental Services Department • Recycling Service Providers • County/City Recycling Coordinator • DHEC
Container Types and Spacing	<ul style="list-style-type: none"> • Various departments (to understand space constraints and amounts generated) • Recycling Service Providers
Cost of Potential Recycling Programs	<ul style="list-style-type: none"> • Recycling Service Providers • County/City Recycling Coordinator (if service provided)
Potential Funding Sources	<ul style="list-style-type: none"> • DHEC • Product Vendors • U.S. Environmental Protection Agency (EPA)
Potential Revenue Shares	<ul style="list-style-type: none"> • Recycling Service Providers • End Markets

such expansion by selecting/sizing collection containers appropriately.

WHICH WASTE GENERATION LOCATIONS AND/OR EVENTS SHOULD BE TARGETED?

Various types and quantities of solid waste and recyclable material are generated in different locations and at different events on campus. A recycling program may begin in selected areas of campus and expand over time. It is generally advantageous to begin a program to target the “low-hanging fruit.” In other words, recycling programs often first target locations and events where recyclables are generated in significant quantity. See “Location. Location. Location.” below.

WHAT ARE THE VARIOUS ROLES AND RESPONSIBILITIES IN A CAMPUS RECYCLING PROGRAM?

The conditions and material to be handled determine the roles and responsibilities in any recycling situation.

Researching & Securing Funding: Grants

A difficult but essential part of setting up and maintaining a college/university recycling program is to secure funding. One way to receive funding is to apply for grants. Be aware: different grants have different requirements and different stipulations as to how funding can be used. Some resources for college/university grants include the following.

- The S.C. Department of Health and Environmental Control's (DHEC) college/university grants, which are discussed in detail in Chapter 1.
- **Grants.gov**, a website operated by the U.S. Department of Health and Human Services, dedicated to helping users find and apply for grants. See www.grants.gov for more information.
- “The Soft Drink Vending Contracts and Recycling Toolkit for Change” is a guide compiled by the College & University Recycling Coalition (CURC) for colleges/universities to secure grants and partnerships with soft drink companies. To access the toolkit, please see <http://curc3r.org/resources/toolkits-guides/>.

There are three categories of recycling collection locations:

1. **Point-of-generation collection location** (e.g., a bin in a room or lounge in a residence hall);
2. **Intermediate collection location**, if needed (e.g., a roll-cart in a residence hall where students empty bins); and
3. **Point-of-collection location** (e.g., a recycling roll-off container behind a dormitory where roll carts are emptied).

Staff/volunteers need to be properly trained on handling, placement and possible issues that may arise from the collection of recyclables relative to each location type. Job descriptions and vendor bid/contract language should be revised as appropriate. Also ensure that all containers are the appropriate size and work well when transferring material into larger containers and/or collection vehicles.

In most cases college/university staff is responsible for emptying intermediate containers into point-of-collection containers. It is recommended that volunteers be used only for recycling at specific events and not day-to-day collection.

Location. Location. Location.

Consider the following locations and events:

- **Offices, classrooms and computer labs;**
- **Residence halls;**
- **Libraries and book stores;**
- **Cafeterias/dining halls;**
- **Athletic facilities;**
- **Common areas;**
- **Move-in/move-out days;**
- **Sporting events;**
- **Construction and demolition activities;**
- **Grounds maintenance activities;**
- **Social/Greek events; and**
- **Conferences, exhibitions and cultural events.**

Point of collection and processing options include having:

- **College/university staff collect and deliver to a privately owned processing facility;**
- **College/university staff collect and deliver to a university processing facility;**
- **A private contractor collect and deliver to a processing facility owned by the same company; and**
- **A private contractor collect and deliver to a processing facility owned by another entity.**

Key advantages and disadvantages of having campus staff provide recycling collection services vs. private service providers are summarized in Table 2.2. Some programs use managed competition as a means to compare pricing of public and private services by having both entities bid.

Whether using campus staff or private service providers to collect and/or process recyclables is more cost effective depends on several factors, including:

- **Accessibility of needed equipment;**
- **Level of competition among service providers in the area;**
- **Whether a service provider also offers other campus services; and**
- **The ability of campus staff to incorporate the use of volunteers.**

When finalizing the recycling program proposal, be sure to include what material will be collected and where containers will be located as well as:

- **Costs of the program including equipment and additional staff hours required;**
- **Potential tons of material (by type) to be recycled monthly and annually;**
- **Any potential cost savings due to avoided disposal costs (e.g., reduction in pull fees and disposal fees for diverting waste from the landfill);**
- **Potential revenues received through the sale of recyclables; and**
- **How the program supports sustainability/ environmental stewardship goals and policies.**

Develop an implementation plan.

Once the proposed recycling program is approved, the next step is to develop the implementation plan. An implementation plan takes the planning process to the next level and addresses the following actions.

1. SELECT THE HAULER AND PROCESSOR.

As described earlier, some colleges/universities may elect to collect and/or process recyclables with campus staff. Colleges/universities seeking to use contractors for hauling and/or processing, however, should solicit proposals at the beginning of the implementation process. This process typically involves the purchasing department and is conducted in accordance with all state and university procurement regulations/policies.

Additional information about contracting for services is provided in Chapter 10.

2. SELECT COLLECTION AND PROCESSING EQUIPMENT.

Working with the hauler and processor (if applicable), the college/university should proceed with selecting and acquiring the necessary collection equipment.

Researching & Securing Funding: CONVERSATIONS

One key to obtaining financial backing to implement and maintain a recycling program is getting operations-based departments on board. Some departments are able to contribute funds, resources and volunteers. Almost all departments can lend their voices to show college/university administration that the desire for recycling is widespread. When having conversations with different departments, it is important to take their ideas into consideration and, if possible, work together on plans.

When setting up a recycling program, the biggest conversation to be had is with the administration. Come to this conversation with data and ideas. If viable, bring up the cost of waste disposal fees compared to recycling fees or the potential profits of certain waste streams. If the program can save or make money for the college/university, the administration is more likely to invest in it. Try to prepare ideas for covering some of the cost of the program as well, like adding a \$5 recycling charge to annual student activities fees.

Consider the following:

- **Recycling bins/roll-carts;**
- **Recycling drop-off containers** (e.g., dumpsters, roll-off containers, compactors); and
- **Recycling collection vehicles.**

Recycling collection vehicles may include:

- **Golf carts** (compatible with bags and small carts);
- **Pick-up trucks** (compatible with bags and carts);
- **Side-loading collection vehicles** (compatible with carts);
- **Rear-load collection vehicles** (compatible with all types of bags, carts and dumpsters); and
- **Front-end collection vehicles** (compatible with dumpsters and sometimes carts).

Most college/university processing facilities are relatively small and limited in operation. If constructing a processing facility is an option, consider:

- **Designing the facility for potential growth and flexibility** (e.g., ability to add material);

- **Adequate ventilation, air filtration and temperature control;**
- **Protecting collected material from rain and moisture;**
- **Managing odor, dust and noise;** and
- **Ensuring the facility can accommodate lift gate heights, large equipment and traffic safely.**

Basic equipment needs for a small processing facility might include:

- **Baler(s) to bale fiber material, plastics, aluminum and steel;**
- **Can densifier, to convert aluminum cans into “bricks;”** and
- **Forklift(s) and/or skid steer to move material.**

When researching equipment to purchase, consider whether there is a local sales/service representative. Sometimes used equipment can be purchased for a discount or equipment can be leased that often includes a maintenance contract.

TABLE 2.2: Advantages and Disadvantages of Service Provider Options

SERVICE TYPE	ADVANTAGES	DISADVANTAGES
Campus Staff Collects and/or Processes	<ul style="list-style-type: none"> • College/university has flexibility to design/change program. • College/university retains all revenue from the sale of recovered material (if processing). • College/university has full control. Contracts are not required. 	<ul style="list-style-type: none"> • Staff may not have expertise in collection/processing/marketing. • Staff is not likely to have connections with end markets. • Would likely require capital investment in collection and/or processing equipment. • The college/university accepts more risk.
Private Hauler Collects and/or Processes	<ul style="list-style-type: none"> • Hauler has expertise in field. • Hauler has contacts and leverage in the marketplace. • Hauler owns collection and/or processing equipment. • Record keeping is done for you (if written into contract). • It reduces staff, student and volunteer requirements. • There is potential to work with the current waste hauler (assuming services provided by private entity). 	<ul style="list-style-type: none"> • The college/university has less flexibility in designing/changing program. • The college/university has less control.

3. IDENTIFY POTENTIAL PARTNERS.

Partners on and off campus may be able to provide expertise, volunteers, outreach and other support, equipment (e.g., containers, signs) and/or funding to a new recycling program.

Prior to kicking off the recycling program, consider seeking volunteers and partners such as:

- **Residence life staff;**
- **Environmental groups or students involved in environmental studies;**
- **Public relations staff;**

Researching & Securing Funding: PILOT PROGRAMS

One of the most effective ways to secure funding for the implementation/expansion of a recycling program is to prove its necessity by conducting a pilot program.

A pilot program should be small enough to be managed by a few dedicated individuals, but big enough to produce results. Before you set up your pilot, you may want to conduct a waste audit in order to determine approximate waste diversion potential. Initial steps to starting a pilot recycling program include:

1. **Selecting which material to target;**
2. **Based on the selected material, choosing a prime location for collection** (e.g., if collecting office paper, one building with both classrooms and offices would be a good pilot location);
3. **Determining the hauling logistics** (e.g., can it be added to the waste hauler contract? Will you take it to a recycling center yourself?);
4. **Setting up and clearly labeling recycling bins and signage explaining the recycling effort;**
5. **Collecting material and careful measurements for a set amount of time;** and
6. **Analyzing and presenting your results.**

Based on the results of your pilot program and research (e.g., cost of tipping fees, cost of recycling services), you can move forward with gaining support for your program.

- **Student life;**
- **The athletic department;**
- **Local non-profits;**
- **Product manufacturers/programs supported by cooperatives** (e.g., Call2Recycle);
- **Recycling service providers;**
- **Local government officials;** and
- **Food/beverage vendors.**

In some cases it may be possible to include participation in the recycling program within the vendor's contract (e.g., food service, sports arena management, retail vendors). It is important to keep in mind that college/university staff should have the lead role in developing and maintaining the program and that student volunteer roles should be secondary.

Twin the Bin

Placing recycling containers next to trash cans is called "twinning the bin." This reminds users that there is a choice and prevents a recycling container from turning into a trash can. If working with a contract hauler, check to ensure that the recycling containers are compatible with the hauler's collection vehicles.



4. TRAIN STAFF AND VOLUNTEERS.

It is important that staff and volunteers are clear on their roles and responsibilities. They also should know:

- **How the program will be monitored** – what metrics will be used to measure success;

- **The benefits of the recycling program;** and
- **Who the point of contact is if they have questions or concerns.**

Once the program is underway, review procedures so that any issues identified can be resolved quickly.

POINT-OF-GENERATION CONTAINERS

PURPOSE: For depositing recyclable material where they are generated.



3-gallon desk-side bin



28-quart paper recycling bin with 4-quart trash can



45-gallon three-stream recycling station

INTERMEDIATE (RECYCLING) CONTAINERS

PURPOSE: For consolidating material into fewer, centrally located containers.



64-gallon roll cart



18-gallon recycling bin



1/2-cubic yard "gravy boat" container

POINT-OF-COLLECTION CONTAINERS

PURPOSE: To consolidate all material for pickup at one outdoor location to be taken to a recycling facility.



10-cubic-yard container



Divided 40-cubic-yard roll-off container



6 X 9-foot metal trailer with 5-foot sides

Other tips for working with staff and volunteers include:

- **Plan for turnover** – have a plan to recruit additional volunteers; and
- **Keep volunteers excited by informing them of program successes and expressing gratitude for their assistance.** Provide them with perks, if possible, such as T-shirts or meal tickets.

5. DEVELOP EDUCATION AND OUTREACH PLAN.

It is important to educate students, faculty and staff about the recycling program as early as possible and to be receptive to their feedback. For many on campus, recycling may be a new behavior so educating the target audience about the recycling program is key.

6. DEVELOP RECYCLING PROGRAM TRACKING METHODS.

Regularly collecting data to track the progress of the recycling program is important to document success and potential areas for improvement. If benefits and progress over time are noted, then the program stands a greater chance of continued support from campus administrators.

It is important to consider the metrics that will be used to measure program success while designing the program to be sure that it is possible to obtain such information – either from contracted service providers or from university/college staff and volunteers.

More information on recordkeeping and reporting is provided in Chapter 11.

Finding Volunteers

Volunteers can be vital to the existence of a recycling program. They are traditionally seeking short-term, structured activities that give back in a positive way. Volunteer activities can include football games, community clean-ups and special events.

VOLUNTEER STRUCTURE

As an office, you have to determine the best structure for your volunteer program based on the following factors:

- **Why do you need volunteers? What will they benefit?**
- **Who will organize the volunteers?**
- **What are the short- or long-term volunteering options?**
- **What types of projects and duties should be performed?**
- **Are incentives available?**

WHERE TO GET VOLUNTEERS

Volunteers sometimes will find you, but most times you must find them. There are several options in seeking volunteers for a program or event.

- **Classroom and Civic Presentations:** With an already captive audience, send a sign-up sheet around to get contact information of interested students and others.
- **Student Organizations:** Several student organizations are required to have community service hours. Approach them to see how to collaborate.
- **Social Media:** Promote your event, project or program online to your followers and fans and plan for response.
- **Career Services/Internships:** Some students are seeking opportunities to volunteer in order to get career experience. If you are seeking a long-term commitment, an internship is a great option. Not only are you able to fulfill the career goal needs of a student, but you get an honest, accountable commitment from someone for your program.

SOURCE: Coastal Carolina University Office of Sustainability

Implement the recycling program.

Before launching the program, ensure all of the following elements are in place.

- **Containers are located in the appropriate places** as described in the plan.
- **Any necessary stickers, signage or emblems are on containers and educational posters are securely placed.**
- **Recycling staff and volunteers are trained regarding their responsibilities.**
- **A contract or service agreement has been established with the recycling service provider(s)** including price and schedule (as appropriate).
- **A system is in place for a specific staff member to monitor and record the success of the program** as well as to gather feedback.
- **Campus employees have been trained on the basics of recycling** and have contact information if they have questions.
- **Outreach regarding the program has been planned and implemented.** This might include an event, social media, updated website information, distribution of print material and visual displays.
- **A method of sharing program results with all participants has been established.**

The recycling program should be introduced at a kick-off event that includes:

- **Demonstrations and examples of recycling bins and containers;**
- **Distribution of education and outreach material;** and
- **Unveiling of the recycling program logo (and/or mascot).**

Continuous Improvement

Once the recycling program is underway, it is vital to monitor the program's progress through the reporting and metric analysis described earlier. It is also important to be aware of any new markets, what other institutions are doing in waste reduction and to continuously consider how waste management programs can better support the college's/university's sustainability goals.

Continuous improvement involves communicating with staff and students on an ongoing basis and learning from:

- **Recycling organizations**, like the Carolina Recycling Association (CRA), the College & University Recycling Coalition (CURC), Keep America Beautiful (KAB), the National Recycling Coalition (NRC), Association for the Advancement of Sustainability in Higher Education (AASHE) and the Southeast Recycling Development Council (SERDC);
- **DHEC's Office of Solid Waste Reduction and Recycling;**
- **Other colleges/universities;** and
- **Recycling service providers.**

Results from monitoring such information can be used to fine tune the program so that it operates more effectively.

References & Resources for Chapter 2

- The Association for the Advancement of Sustainability in Higher Education, www.aashe.org
- Call2Recycle, www.call2recycle.org
- Carolina Recycling Association, www.cra-recycle.org/
- College and University Recycling Coalition, www.curc3r.org/
- Keep America Beautiful, www.keeppamericabeautiful.org
- National Recycling Coalition, www.nrcrecycles.org
- R. W. Beck, "Effective Contracting for Recycling Programs," Pennsylvania Department of Environmental Protection, Training Session, April 2006.
- U.S. EPA, WasteWise, www.epa.gov/smm/wastewise
- Von Kolnitz Cooley, Christine, "Recycling and Beyond: A College Campus Primer," (2001, edited in 2014), http://curc3r.org/wp-content/uploads/2017/10/Recycling_and_Beyond_College_Campus_Primer.pdf

The Role of the Collegiate Recycling Coordinator in Education & Promotion

Collegiate recycling coordinators understand the benefits of waste reduction and recycling and at the same time recognize that the public may not. Further, recycling and waste reduction are not the primary concern of students, faculty and the administration. Collegiate recycling coordinators can increase recycling program support through the approaches described below.

- **Promotion:** Making the campus community aware that recycling services are available and providing details about the program. Promotion also includes encouragement to use the program. EXAMPLE: Recycling on campus is easy – just look for the blue bins.
- **Instruction:** Directing faculty, staff, students and visitors to take specific actions to correctly participate in recycling programs. EXAMPLE: Remove metal caps from glass bottles before recycling or recycle magazines with newspaper.
- **Education:** Educating students and staff about the benefits of recycling in a larger sense, connecting recycling to the community and providing information on the impact of recycling on human health as well as the environment and economy. EXAMPLE: Recycling has significant environmental, economic and human health benefits.

The Value and Impact of Recycling Promotion & Education

Both the public and private sectors have invested significantly in recycling infrastructure from collection to markets and their continued existence and growth depend on the voluntary participation of individuals. Public education is vital to encouraging individuals to recycle and helping them understand:

1. **What can be recycled;** and
2. **How to prepare material for recycling.** Education efforts are particularly important when changes are made to a program or special services are offered (e.g., e-scrap collection events).

Effective public education and promotion result in increased participation and reduced contamination resulting in better material quality. These benefits in turn

improve the cost-effectiveness of the recycling program. Well-designed and implemented campus education efforts can enhance public support for collegiate recycling programs by developing a sense that recycling is the norm.

Best Practices in Promotion & Education Programs

DEFINE THE TARGET AUDIENCE

Broad outreach campaigns may aim to reach the entire community, but even college/university campuses are made up of multiple audiences that can be targeted more specifically. For example, an outreach or education campaign may aim to reach:

- **Incoming freshmen;**
- **Campus visitors or attendees of a specific event;**
- **Those living in a specific dormitory;**
- **Those who dine in certain locations;** or
- **New employees.**

Alternatively, education and outreach could be geared to reach those who currently do not recycle or those who do not recycle properly. It is important to identify the target audience to gain an understanding of potential barriers that may prevent them from recycling as well as what is important to them.

Is there a graphic artist in the house?

Clear and consistent communication is necessary to successfully promote any recycling program. Your college/university graphics department may provide layout and design services for printed education and outreach material including brochures, posters, billboards and other signs for your campus recycling program.

The S.C. Department of Health and Environmental Control (DHEC) also can provide customized versions of its print material. If publications need to be in other languages, DHEC can have the material translated. These services are available at no cost.

Reaching Out to College/University Leadership

Of all the audiences that might be targeted for outreach and education, one of the most important is the college's/university's leadership. Administrators and student leaders need to be informed and updated about recycling opportunities in the campus community.

Officials who understand the importance of recycling can become program allies and offer support including:

- Securing additional funding and other resources;
- Reducing administrative obstacles;
- Advocating for relevant policy changes;
- Acting as role models for staff and the public; and
- Positively influencing others who do not share the same enthusiasm.

TAILOR THE MESSAGE TO THE TARGET AUDIENCE

Understanding what motivates different audiences, especially those most in need of encouragement to recycle, is important when developing the message and avenues for promotion and education. Research shows that information about how to recycle is not always the key to motivation. Economic benefits and simply being asked or told to recycle also can be significant motivators to recycling behavior among "light recyclers."

Print Media

Print media (e.g., bookmarks, brochures, posters) can be an effective means of reaching the target audience because messages and details can potentially be targeted to specific outlets.

NOTE: Print media uses valuable resources and can be overwhelming (e.g., multiple posters in one location, a plethora of unwanted handouts). Use sparingly and strategically.



When developing a message for a specific audience, consider the following questions.

1. What is the intended message?
2. What action is desired of the target audience?
3. What seems to motivate the target group?
4. How can the target group be reached? What will get their attention?
5. How can the target audience stay engaged?

CREATE A RECOGNIZABLE SLOGAN AND/OR LOGO

A recognizable logo and/or slogan can help build "brand identity" for the recycling program. Placing the logo and/or slogan on educational and outreach material and collection containers helps with program recognition and sends the message that the college/university supports the program.

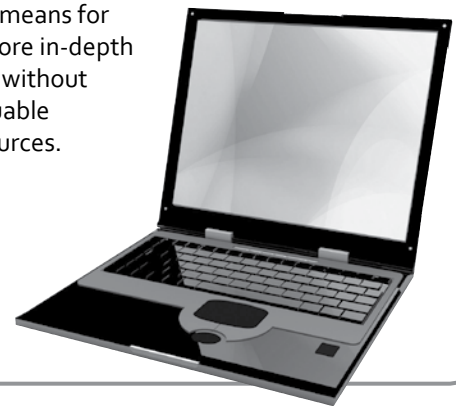


SELECT THE APPROPRIATE AVENUE(S) TO REACH THE AUDIENCE

Tools available to collegiate recycling coordinators to disseminate their messages can be grouped into five broad categories, which are described in the following boxes.

Electronic Media

Electronic media (e.g., e-newsletters, sustainability page on college/university website, social media) is a great way to reach a target audience at a relatively low cost. It also can be an effective means for providing more in-depth information without wasting valuable natural resources.



FREQUENT & CONSISTENT OUTREACH & COMMUNICATION

Visual consistency in the recycling program – on containers, signs, logos and printed material – helps recycling program users participate properly with little effort. For example, if green containers are consistently used for recycling paper, bottles and cans and brown containers are consistently used for recycling organics such as food waste, then participating in the program may become almost automatic.

Tips for Using Social Media

Social media has become increasingly popular due to its immediate feedback and audience engagement. Technology and trends regarding social media are constantly changing so it is important to keep up with both messaging as well as relevance. Tips for the successful use of social media are listed below.

- **Identify which social media options are popular among the target audience before initiating an outreach effort.**
- **Select one or two social media outlets and try to use them well.**
- **Be sure that posted messages are accurate and free of grammatical errors.** Errors will erode credibility.
- **Know the college/university policy on public messaging.** It may need to be reviewed by the administration before posting.
- **Try to keep posts interesting.** Write so that the reader is compelled to act.
- **Write to encourage shares or re-tweets.**
- **Avoid redundancy and self-promotion.**
- **Try to include pictures.**
- **Try to engage readers by asking them questions.**
- **Include the program's website in postings.**
- **Notice the types of posts that elicit the most response.**
- **Use social media analytics to see what is effective.**

Consistency helps keep participation levels high and develops a strong program identity. Colleges/universities with sustained outreach and defined audiences are more

Prompts & Incentives

Prompts and incentives (e.g., recycling bins with program logo and instruction, pencils, coffee mugs, other giveaways) remind people to participate in recycling programs. If possible, it is best to use incentives that:

- **Are made of recycled-content material;**
- **Are recyclable;**
- **Are used on a regular basis** or in plain sight that remind people to participate; and/or
- **Facilitate waste reduction.**

REMEMBER: Use the recycling program's logo and colors on incentives to solidify the brand and reinforce participation.

In-Person Outreach

In-person outreach (e.g., special events, presentations, new employee orientations) is important because it facilitates a personal interaction and connection between the program promoter and the community.

The enthusiasm of the promoter can foster a positive impression of the program. It provides an opportunity for participants to address any concerns regarding the program or identify additional recyclable material that might be included in a recycling program.

Broadcast Media

Broadcast Media can be a costly way to advertise or promote a waste reduction and recycling program. It also can be challenging to find a broadcast media market that is in line with the program being promoted. Colleges/universities may have the advantage of having their own radio stations and/or closed-circuit television stations that they can use to promote their waste minimization/recycling/sustainability programs – often at no cost.

successful in increasing participation than one-shot campaigns, no matter how much fanfare or funding is spent on the one-time effort. Regular reporting on program progress can motivate the college/university by showing that their actions have results.

Regular Monitoring of Results

Changes in the amounts recycled, the quality of material recycled or increased participation can indicate success on the part of education and promotion programs. These metrics, however, can be influenced by many other factors.

Social Marketing

Social marketing is the adaptation of commercial marketing techniques designed to influence the voluntary behavior of target audiences and improve their personal welfare and that of the society of which they are a part. According to social marketing principles, there are three reasons people do not engage in a socially beneficial behavior (in this case, why people don't recycle).

- 1. People are not aware of the opportunity or its benefits.** People may not know that recycling facilities are present on campus or what can be recycled.
- 2. People are aware of the opportunity, but may see difficulties or barriers.** Five of the most common barriers are:
 - **Lack of convenience** (Recycling bins are not paired with all trash cans.);
 - **Established habits** (I can't remember to recycle.);
 - **Beliefs** (The environment is fine and recycling is not important.);
 - **Time** (Sorting material takes too much time.); and
 - **Misinformation.** (Recyclables are thrown in the trash after collection.)
- 3. People are aware of the opportunity, but see no direct benefit to them or their community.** For example, some may think that recycling is a "feel good" activity that achieves no real benefit or that it draws resources from programs that are more important to them.

To obtain other meaningful input about the recycling program, it can be helpful to implement some form of formal qualitative research to gauge the impact on individuals' behaviors.

Direct contact with the campus population (e.g., distributing fact sheets and brochures at a sporting event or social gathering) can provide an opportunity for collegiate recycling coordinators to solicit information directly from the users of the recycling programs. Easy-to-use online survey tools also are available at no cost.

Office Resources

The Office has developed recycling education tools to reach a statewide audience that recycling coordinators can use in their programs.

- **The Recycle Guys:** Introduced in 1992 as the Office's logo, the Recycle Guys (pictured on the following page) remind everyone to recycle and observe Earth Day and America Recycles Day. Posters and other tools are available, featuring a large number of creatively rendered, popular-culture images of "the Guys." These prompts can capture people's attention and

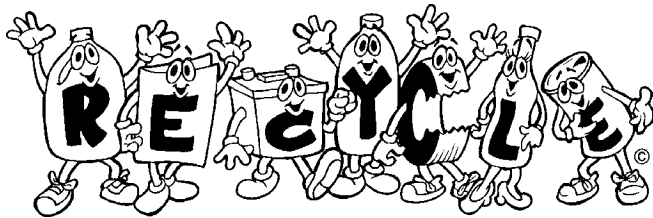
Success Story

The Office encourages away-from-home recycling through a number of different programs. In partnership with the **S.C. Department of Parks Recreation and Tourism**, the Office has provided recycling opportunities at all of the state's parks.

Many S.C. local governments also have established recycling collection points in community parks as well as at festivals and other events.



draw them in to the larger message about recycling. Recycle Guys costumes are available for use at campus and sporting events. These resources are provided to college/university recycling coordinators at no charge.



- **RecycleMoreSC:** This campaign is designed to reinvigorate recycling in South Carolina. For details, see the text box on page 6.

Other Resources Available

America Recycles Day: ARD is a national awareness campaign celebrated annually on November 15 and is designed to encourage people to recycle and buy products made from recycled material. As part of the campaign, colleges/universities and others throughout the state hold special events to raise awareness of recycling opportunities. Visit www.americarecyclesday.org to learn more.

References & Resources for Chapter 3

- America Recycles Day, www.americarecyclesday.org
- Andreasen, Alan R. "Social Marketing: Its Definition and Domain," *Journal of Public Policy and Marketing*, 1994.
- DHEC, Recycling Information, www.scdhec.gov/recycle
- Earth 911, www.earth911.org



Social Marketing Strategies

There are several tested social marketing strategies that are proven to help people change their behavior. They include the following:

- **Commitment:** To change people's behaviors have them make a commitment. Group commitments can be more effective because members will motivate each other.
- **Prompts:** Visual and auditory aids can help people remember to engage in a behavior. Prompts should consider the audience and do not have to include a lot of information – they are generally meant to have an immediate visual impact. The Office has a collection of visually appealing posters that can be placed in classrooms, hallways and other locations to remind people to recycle.
- **Norms:** Develop norms that make recycling an accepted, mainstream activity in which most people participate. Norms are a form of "positive peer pressure" and help people overcome the hesitancy they might feel about engaging in a new activity.
- **Communication:** Each of the strategies described should be used as part of an overall communications plan to increase the power of the information that is central to the success of the recycling program. Communication must be done regularly and it also must attempt to:
 - Attract the attention of the audience initially through the use of visual aids, startling facts, music, etc.;
 - Keep their attention through the delivery of the information;
 - Make them want to retain the information because it relates to something that is important to them; and
 - Provide a phone number and/or website where more detailed information and instructions are provided.
- **Incentives:** Although many students may not see a direct financial incentive to recycling, avoided solid waste disposal costs borne by the campus and delaying the need for new landfills are incentives that can be quantified and communicated.

Managing Organics

CHAPTER 4

What are organics and composting?

Organics are material from plants and animals such as leaves, yard trimmings and grass clippings as well as food scraps. Composting is the controlled natural decomposition of organic material.

Microorganisms break down this material into compost, a dark, crumbly, soil-like amendment that can be used in gardens and for landscaping.



Recycling – not composting – is the preferred method for managing unsoiled paper, although paper is considered organic. When organics are mentioned in this chapter, they reference yard trimmings, food waste, clean wood (not

painted, stained or treated with other chemicals) and compostable paper [i.e., paper that is not recyclable (e.g., tissues, napkins, paper towels or soiled, uncoated paper)].

What portion of the waste stream is organics?

Compostable material (excluding paper and paperboard) comprised about 28 percent of the nation's municipal solid waste (MSW) in 2015 according to the U.S. Environmental Protection Agency (EPA). More than half of that is food waste while the remainder is yard trimmings.

Types of Organics

There are several types of organic waste that may be generated at a college/university including:

- **Yard trimmings and land-clearing debris** (e.g., brush, tree limbs, stumps);
- **Wood waste;**
- **Agricultural waste;**
- **Food waste** (pre- and post-consumer);
- **Soiled papers;** and
- **Compostable food service ware** (e.g., cups, bowls, plates, take-out containers, utensils).



S.C. Policy Regarding Organics Waste Management

- **The S.C. Solid Waste Policy and Management Act of 1991 (Act)** bans yard trimmings and land-clearing debris from disposal in a Class 3 (MSW) landfill.
- **The intent of the ban is to encourage the diversion of yard trimmings and land-clearing debris from landfill disposal through beneficial uses such as composting and mulching.**
- **South Carolina revised and expanded its composting regulation (R.61-107.4) in June 2014.** One of the goals of the revision is to encourage the development of more large-scale composting facilities by the public and private sectors.
- **South Carolina's Open Burning Regulation (R.61-62.2) provides guidance on when it is acceptable to burn material** (e.g., land-clearing debris, yard trimmings, brush, leaves). Links to these regulations and additional guidance documents can be found in References & Resources at the end of this chapter.

Current Generation & Management Practices

- **Yard Trimmings and Land-Clearing Debris:** According to South Carolina's composting regulation (R.61-107.4), yard trimmings are residuals consisting solely of vegetative matter resulting from maintenance or alteration of public, commercial, institutional or residential landscapes. They include grass clippings, leaves and discarded plants and weeds that have been source separated and diverted for recycling. The regulation also defines land-clearing debris as "material generated solely from land-clearing activities including brush, limbs and stumps, but does

not include solid waste from agricultural or silvicultural operations.” This material is usually suitable for grinding or chipping.

- **Other Wood Waste:** Other types of wood waste (aside from land-clearing debris and yard trimmings) include wood waste from furniture, construction and demolition activities, trimmings from manufacturing, and uncontaminated wooden pallets. Clean wood (e.g., clean trimmings from manufacturing, sawdust and pallets that cannot be repaired) is suitable for mulch and composting. Treated/ manufactured wood (e.g., painted and stained wood, particle board, medium-density fiberboard) is not suitable for mulching or composting due to chemical treatment. Furniture or fixtures made from treated/manufactured wood can be donated to charitable organizations if still in good condition or disposed of in Class 1 (land-clearing debris) or Class 2 (construction and demolition debris) landfills.
- **Agricultural Waste:** In South Carolina, agricultural crop residue is considered a waste unless it is reused on the farm as a soil amendment or for erosion control. Agricultural residue may include manure, vegetative waste and animal remains. Bedding and manure from animals is generally suitable for composting. Regulatory oversight depends on a number of factors including how the farm waste is used.



**SUITABLE
FOR COMPOSTING**



**NOT SUITABLE
FOR COMPOSTING**



- **Soiled Papers:** Used paper towels, napkins, soiled non-wax-coated paper and cardboard (e.g., paper plates, pizza boxes) generally can be included in a composting program. If material can be recycled in your local program, the higher-value use should be promoted.
- **Compostable Food Service Ware:** Some food service ware (cups, bowls, plates, takeout containers and cutlery) are made from compostable material such as plant starches. Some products have been problematic to processors, however, because they do not biodegrade completely. The American Society for Testing and Materials (ASTM) has standards for compostable plastics (ASTM D6400 and ASTM D6868). Due diligence should be taken before composting these types of products. To learn about the standards, visit www.astm.org/Standards/D6400.htm and www.astm.org/Standards/D6868.htm.
- **Biosolids:** It is feasible to compost or land apply biosolids from wastewater treatment plants. Establishments must, however, secure a permit from the S.C. Department of Health and Environmental Control (DHEC). Biosolids composting is a complex and highly regulated process due to the presence of pathogens in the raw material.

Food Waste: This is organic material that communities generate in large quantities. It is classified as pre-consumer (waste from kitchen preparation and unserved leftovers) or post-consumer (plate scrapings and served leftovers that could include a combination of dairy, animal and vegetative waste). For more about food waste, see Chapter 5.

Why should colleges/universities establish and promote organics recycling programs?

Yard trimmings are banned from Class 3 landfills, but disposal in Class 1 and Class 2 landfills remains an option for generators. Still, diverting this material from disposal in any type of landfill is desirable. Compost is a valuable and diverse product that can be used in many ways across campus.

Recycling coordinators should encourage landscaping services to use compost and mulch to help:

- **Avoid landfill disposal of organics and reduce methane generation at landfills;**
- **Reduce the cost of landscaping products purchased for campus upkeep;**
- **Reduce the amount of water plants require;** and
- **Improve South Carolina's recycling rate.**

There are many beneficial uses for compost.

- **Compost can be used as a soil amendment in lieu of chemical fertilizer.** A few inches of compost tilled into the top layer of soil will provide nutrients for plants and improve soil structure. For potted plants, add one part fine compost to two parts potting soil.
- **It can be used as mulch around plants, trees and shrubs.** This is a particularly good use for coarser compost.

- **Compost helps with erosion control along steep slopes.** Several inches of mature compost, screened one-half to three-fourths of an inch and placed directly on top of the soil, can control erosion by encouraging vegetation growth. Compost, because it retains moisture, also helps protect soil from wind erosion.
- **It can help protect water bodies.** On steep slopes, mounds of compost at the top or bottom can be used to slow the velocity of water and provide additional protection for receiving waters.
- **Compost can remediate polluted soils.** It can absorb odors and degrade petroleum products, pesticides and wood preservatives in soils. Compost also binds heavy metals preventing them from contaminating water sources and plants.
- **Compost can be used to repair damaged turf grass.** When applied as a topdressing, nutrients and micro-organisms in compost stimulate turf growth and increase its resistance to common diseases.
- **It can help alleviate soil compaction.** Incorporating compost and compost amended with bulking agents such as wood chips is a cost-effective way to aerate soil and thereby improve root penetration and increase drainage.



Creative Composting

Paper towels can be composted. Paper towels are thrown away in restrooms. Composting in bathrooms? College/university sustainability programs have set up restroom paper towel composting initiatives targeting dorm bathrooms, libraries and other high-traffic locations with the goal of diverting this paper waste from the landfill.

The steps to enact a paper towel compost pilot are simple:

1. **Replace your standard trash can liner with a compostable liner;**
2. **Place a smaller waste receptacle next to it;**
3. **Label the large receptacle "Paper Towels Only." Label the small receptacle "Landfill;"** and
4. **Post signs on the outside of the restroom door and on the insides of stall doors, explaining a few more details** (e.g., feminine products must go in the landfill receptacle, please keep food waste in food areas to avoid smell and pests).

Logistics must be established as well (e.g., contracting a compost vendor/setting up composting on campus, training facilities staff on handling compost, tracking the diversion rate), but restroom composting is one of the easiest avenues for introducing collegiate communities to composting.

Options for Managing Organics

State agencies have options for managing organic waste depending on their desired level of involvement. Table 4.1 provides a summary of different options for college/university involvement in organics management.

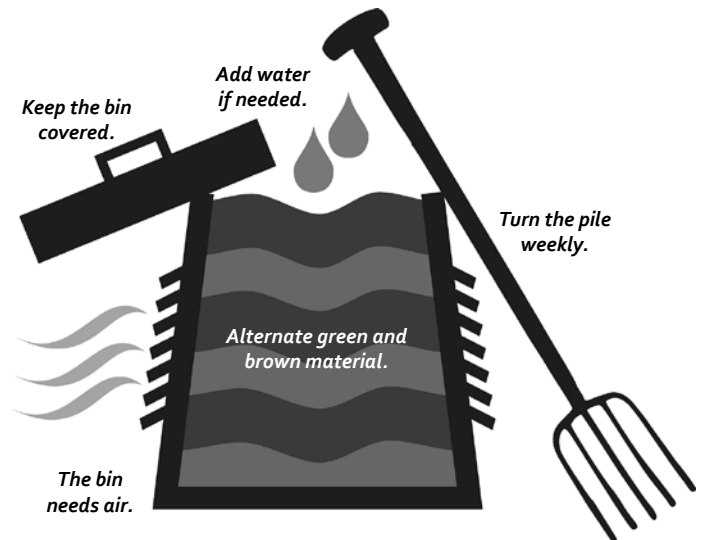
CONTRACT WITH A COMMERCIAL COMPOSTER

Regulations in South Carolina now allow businesses to send their food waste, landscaping debris and other organic material off site for composting. This service provides more opportunities for college/university recycling programs to compost.

Colleges/universities typically negotiate contracts with both a compost hauler and a composter as most composters in South Carolina do not operate hauling services. Please see DHEC's Green Resource Index at www.scdhec.gov/sites/default/files/Library/OR-1838.pdf for detailed commercial composter and hauler listings.

SMALL-SCALE COMPOSTING

For colleges/universities that have space, traditional in-ground composting is an inexpensive way to compost food waste and landscaping debris. An open pile works great for landscaping debris, but an enclosed pile will keep pests away for facilities composting food waste. Multi-bin systems are often used to compost new material while older compost matures.



In-vessel composting can be either small- or large-scale composting, depending on the size and quantity of vessels selected. In-vessel composting offers a quick, space-saving option for colleges/universities with little viable space for composting. In-vessel composting involves enclosing compostable material in a container and controlling the temperature, moisture and aeration to produce finished compost rapidly. In-vessel composters come in various sizes and styles and require less staff time to manage because the equipment turns or agitates the material. In-vessel composters can be expensive, but the cost savings associated with lower disposal fees and a valuable end product can offset the costs.

TABLE 4.1: Organics Management Options for Colleges/Universities

LEVEL OF INVOLVEMENT	ACTIVITY	RESPONSIBLE PARTY		
		Material Collection	Compost Production	Marketing Finished Product
Minimal	Provide material (e.g., yard trimmings, food waste) or other resources to commercial businesses that produce mulch and compost.	Commercial Composter	Commercial Composter	Commercial Composter
Significant	SMALL SCALE: Establish composting program based on one or limited locations on campus.	College/University	College/University	College/University (Finished product is more likely to be kept for campus use due to low yield.)
	LARGE SCALE: Establish composting program based on the entire campus (e.g., yard trimmings, food waste, soiled papers).	College/University	College/University	College/University

See Table 4.2 on how to balance brown and green material in a compost pile.

LARGE-SCALE COMPOSTING

Another option for colleges/universities is to set up a large-scale composting program. The large-scale process requires more up-front investment in space and equipment, potential permitting and continuous labor throughout the composting process. An end market for the resulting compost will likely also be necessary as large-scale composting operations typically produce more compost than a college/university can use on-site.

Many resources are available that provide more detailed information on how to establish a composting operation – see References & Resources at the end of this chapter for a partial list. Before embarking on such a venture, collegiate recycling coordinators should research composting operations, identify the needs of their campus and review South Carolina’s regulatory guidelines. If your college/university determines that large-scale composting is the best option, contact the Office for composting best practices and other resources.



Other Methods for Managing Organics

- **Donation:** Consumable food and reusable wooden products should be donated if a match can be made. This is the highest and best use for this material. Non-perishable and unspoiled perishable food can be donated to local food banks, soup kitchens, pantries and shelters. More information about donation is available in Chapter 5.
- **Rendering and Biofuel Production:** Many restaurants and large-scale institutions contract with rendering companies to recycle their fat, oil and grease. The grease is processed and turned into beneficial products (e.g., animal feed, cosmetic products). Some grease renderers also sell “yellow grease,” which has been processed, to biofuel manufacturers. In some locations, biofuel companies will collect spent cooking grease and process it into biofuel for vehicles. More information about biofuel production can be found in Chapter 5.
- **Wood Grinding:** Most recycled wood waste is chipped or ground for use as mulch, boiler fuel or as a feedstock/bulking agent for compost.
- **Anaerobic Digestion:** This is a biological technology typically used to manage homogenous organic waste streams such as municipal biosolids and agricultural waste. The process involves the breakdown of organic waste in the absence of oxygen. This generates biogas, which can be used as fuel to generate steam and electricity. A digestate byproduct is produced, which can be used as a composting feedstock.

TABLE 4.2: Balancing Green and Brown Material in a Compost Pile

	Greens	Browns
Characteristics	<ul style="list-style-type: none"> • High in nitrogen • Wet • Colorful 	<ul style="list-style-type: none"> • High in carbon • Dry • Not colorful
Examples	<ul style="list-style-type: none"> • Food waste • Grass clippings • Fresh manure • Yard/garden trimmings 	<ul style="list-style-type: none"> • Brown leaves • Soiled paper • Wood chips • Sawdust • Straw
Benefits	<ul style="list-style-type: none"> • Nutrients • Moisture 	<ul style="list-style-type: none"> • Bulk/porosity • Excess moisture absorption

SOURCE: Cornell Waste Management Institute, hdl.handle.net/1813/29111

Food Waste Reduction & Recovery

CHAPTER 5

The State of Food Waste

Food waste was the No. 1 item thrown away in the United States accounting for 22 percent (30.25 million tons) of the nation's waste stream in 2015, according to the U.S. Environmental Protection Agency (EPA). This means that, of the 39.7 million tons of food waste generated, 76 percent was disposed of in landfills.

Food waste comprised almost 15 percent (an estimated 688,556 tons) of South Carolina's waste stream in fiscal year (FY) 2017 (July 1, 2016 to June 30, 2017) according to the S.C. Department of Health and Environmental Control (DHEC). Of that amount, only about 2.3 percent (about 15,900 tons) was recovered.

A study by the Natural Resources Defense Council (NRDC) reveals that at least 40 percent of all food grown and processed nationwide goes uneaten each year at a

cost of up to \$218 billion annually. The U.S. Department of Agriculture reports that an average a family of four disposes of \$1,800 worth of food. Yet nearly 700,000 South Carolinians are food insecure according to Feeding America – a non-profit organization with a network of food banks that is leading the fight against hunger in communities nationwide.

Wasted food also means wasted resources. The growing, processing, packaging and transporting of food uses significant amounts of water, energy, time, money and other resources – all lost if the food is not consumed.

Colleges/universities create a significant amount of food waste. Given that, they have an essential responsibility in not only reducing and recovering food waste but also educating students and others about recovering wholesome food for donation.

Benefits of Reducing Food Waste

The benefits of reducing food waste are many.

- **Food donation is a great way to provide surplus food to those who need it.**
- **Reduce methane emissions from landfills.** Wasted food rots in landfills and produces methane gas.
- **Organics recovery is an emerging market in South Carolina, creating jobs and businesses for food waste haulers, composting facilities and others.** For every million tons of composted material, 1,400 jobs are created, according to the S.C. Department of Commerce.
- **Preventing food waste prevents wasted water, energy and land used to make the food.** Throwing away one egg, for example, wastes 55 gallons of fresh water, according to the NRDC.
- **If you cannot prevent, reduce or donate – compost.** Sending food waste to a composting facility or composting at home can improve soil health and structure, increase water retention, support native plants and reduce the need for fertilizers and pesticides.
- **Reducing or stopping food waste can save families, businesses and colleges/universities money** through smart purchasing, improved food preparation and storage practices as well as lower disposal costs.



S.C. Policy Regarding Food Waste & Food Waste Recovery

Food waste prevention and recovery is a priority in South Carolina. Beyond the economic, environmental and social benefits previously outlined, food waste recovery also provides South Carolina with a significant opportunity to achieve the state's per capita waste reduction (3.25 pounds or less) and recycling (40 percent of the MSW stream) goals by 2020.

As mentioned in previous chapters, South Carolina revised and expanded its composting regulation (R.61-107.4) in June 2014 in part to encourage the development of more large-scale composting facilities by the public and private sectors.

DHEC also is addressing this issue through technical assistance, grant funding and outreach/education efforts. DHEC's Office of Solid Waste Reduction and Recycling (Office) is promoting food waste prevention and recovery through all of its programs in addition to developing an education/outreach campaign called Don't Waste Food SC.

The campaign is designed to provide information to inspire individuals, businesses and communities to reduce food waste through prevention, donation and composting.

The campaign is a partnership of the S.C. Department of Health and Environmental Control and S.C. Department of Commerce along with many shareholders participating in the movement to reduce food waste in South Carolina. Please email dontwastefoodsc@dhec.sc.gov or visit www.scdhec.gov/dontwastefoodsc for more information or to get involved.



What is food waste?

Food waste is the portion of the organic waste stream that includes food that is discarded or uneaten. Pre-consumer food waste includes:

- **Trimmings from fruits, vegetables, meats, etc.;**
- **Incorrectly prepared or overproduced dishes in restaurants;**
- **Produce deemed “too ugly” for retail shelves; and**
- **Forgotten or over-purchased food that spoils before it gets eaten.**

Post-consumer food waste is plate scrapings and served leftovers. Both of these kinds of food waste can be generated in all community sectors (residential, commercial and institutional) at a variety of locations including:

- **State agencies and colleges/universities;**
- **Health-care facilities** (e.g., hospitals, nursing homes);
- **Industrial facilities, offices and other businesses;**
- **Residential homes;**
- **Schools and child-care facilities; and**
- **Supermarkets.**

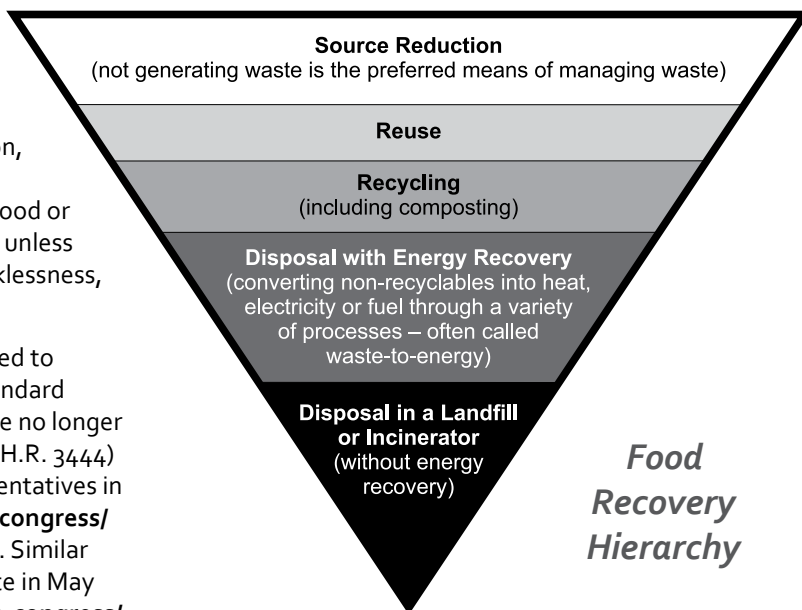
Laws Regarding Food Waste Recovery

Governmental entities, businesses, organizations, schools and colleges/universities can donate food and are given liability protection through federal and state laws.

- **The Bill Emerson Good Samaritan Food Donation Act** (Act) protects food donors from civil and criminal liability should the donated food later cause harm to its recipient. The Act was signed into law in 1996 and covers “apparently wholesome food” or “apparently fit grocery product” intended for human consumption that is donated in good faith to a non-profit organization for distribution to those in need. The purpose of the Act was to standardize various state laws and encourage more entities to donate food, thus reducing food waste.
- In addition, South Carolina law provides liability protection for food donors through **S.C. Code of Laws §§ 15-74-10 et seq.** According to the law, “the

donor, in good faith, of distressed food apparently fit for human consumption, to a bona fide charitable or nonprofit organization or food bank or prepared and perishable food program for free distribution, is not subject to criminal penalty or civil damages arising from the condition of the food or the nature or condition of the land entered, unless an injury is caused by gross negligence, recklessness, or intentional misconduct of the donor.”

- **Proposed legislation** also is being considered to reform food labels and create a national standard regarding the accuracy of when products are no longer safe to eat. The Food Recovery Act of 2017 (H.R. 3444) was introduced in the U.S. House of Representatives in December of 2015. Visit www.govtrack.us/congress/bills/115/hr3444 for more details on the bill. Similar legislation was introduced to the U.S. Senate in May of 2016. Visit www.congress.gov/bill/115th-congress/senate-bill/1680 for more details on the legislation. Both bills intend to reduce the amount of food thrown away each year that is actually safe to eat.



Options for Managing Food Waste

Colleges/universities have many options for managing food waste on campus, from educating about source reduction to a more hands-on approach such as establishing a composting operation. Going through the EPA Food Recovery Hierarchy (above), each waste management method is described below, providing different options for colleges/universities to consider.

SOURCE REDUCTION

The prevention/reduction of food waste is EPA's preferred method of managing this waste stream. Reducing food waste at the source of generation requires a change in habits and daily practices, most often accomplished through public education and outreach. The messages

should be tailored for residents, faculty and staff and should include the benefits to reducing food waste. Several source reduction recommendations are provided below.

- **Provide tips on meal planning** (e.g., make a shopping list to avoid over-buying, inventory the pantry before shopping) and proper food storage to maximize freshness (e.g., freeze excess produce before it spoils, make soup with extra vegetables).
- **Encourage residents and dining halls to buy less-than-perfect fruits and vegetables** to reduce the amount of produce thrown away by grocery stores. The organization EndFoodWaste.org started a campaign on social media – **@UglyFruitAndVeg** – encouraging people to buy and post pictures of produce that is misshapen or off-color.
- **Consider going trayless in cafeterias.** According to EPA, dining services are seeing significant reductions

Practical Ways to Avoid Food Waste

- **Avoid overpurchasing.**
- **Reduce spoilage through proper storage and planning.**
- **Trim only what is needed when prepping food and use trimmings for stocks and sauces.**
- **Reduce post-consumer waste by preparing food to order and offering smaller portions and takeout containers** (preferably ones that can be recycled or composted).



in food waste by simply removing trays from dining areas/cafeterias. Trayless dining has, on average, reduced post-consumer plate waste by 30 percent.

- **Encourage food-related venues** (e.g., dining halls, cafes, restaurants, convenience stores) **to conduct a waste audit to determine the types and quantities of food being wasted.** Dining halls should adjust their menus if a particular dish tends to go uneaten on a regular basis.

The avenues used to reach the targeted audience will vary. Print media and electronic media are great examples for campus outreach showing the benefits of reducing food waste. For food and events services, it is likely to be more productive to conduct site visits to discuss food waste reduction strategies specifically tailored for each.

FEED HUNGRY PEOPLE

Hunger not only affects the homeless, but also people who have fallen on hard times and are struggling to make ends meet. Food donation programs help feed people, reduce the amount of food waste disposed of as MSW and offer tax benefits to those donating food. With the passage of the Act (discussed previously in this chapter), donors are protected from liability as long as the donated food is intended for human consumption and has been made in good faith. Listed below are examples of food donation programs.

- **Food Banks, Soup Kitchens & Shelters:** Almost every community has a food bank or soup kitchen

to help residents who do not have enough to feed themselves or their families. Most often, canned and packaged foods are accepted at food banks while prepared foods from restaurants and caterers are



delivered to shelters or soup kitchens for immediate consumption via food networks. South Carolina food networks include Second Helpings and Loaves & Fishes. The S.C. Food Bank Association (which includes Golden Harvest, Harvest Hope, Lowcountry and Second Harvest Food Banks) is a member of Feeding America, a nationwide network of food banks. Links to these organizations can be found in the Resources & References section of this chapter.

- **Food Drives:** Local food drives offer residents and businesses an easy way to help those in need. Many times a food drive will be paired with an event – such as a concert, a sporting event or a holiday party – in which attendees are asked to bring a non-perishable food item that will be donated to a local food bank.
- **Gleaning:** The act of collecting excess fresh foods from farms, gardens, farmers' markets, grocers and other sources is called gleaning. In South Carolina, the non-profit group Fields to Families links farmers with excess fruits and vegetables to organizations that feed the hungry in the Lowcountry (mainly Charleston, Dorchester and Berkeley counties).

Loaves & Fishes: Making a Difference

Loaves & Fishes in Greenville, SC is an example of a successful food donation organization.

Local restaurants, grocery stores, caterers and farmers contact the non-profit group whenever they have surplus food. Loaves & Fishes drivers collect the food and deliver it to people through partner agencies such as non-profits, churches, Section 8 apartment communities and other established food relief programs. In addition, Loaves & Fishes accepts donations and coordinates canned food drives. In 2015, Loaves & Fishes distributed more than 1.9 million pounds of food in Greenville County.

Visit www.loavesandfishesgreenville.com for more information.



FEED ANIMALS

Feeding food scraps to animals often provides companies a less expensive option for food waste disposal than landfilling, and the farmer who owns the animals saves money by not having to buy as much feed. Some zoos accept certain food donations, typically from food manufacturers that have excess product. Food scraps also can be diverted to companies that produce animal or pet food. Before any food scraps are fed to animals, local and state rules and regulations must be followed.



The Federal Swine Health Protection Act of 1980 requires that all food waste fed to swine must be properly treated to kill disease organisms. The Food and Drug Administration's (FDA) Bovine Spongiform Encephalopathy/Ruminant Feed Ban Rule prohibits the use of mammalian protein (e.g., animal tissue) in feeds for ruminant animals (e.g., animals that have a stomach with four chambers through which feed passes during digestion). This means that vegetative waste may be fed to farm animals so long as it has not come into contact with animal waste.

Feeding food waste to swine is covered by S.C. Code of Laws §§ 47-15-10 et seq. According to this statute, the feeding of garbage (e.g., animal wastes resulting from handling, preparation, cooking, or consumption of foods, animal carcasses, parts of animal carcasses, contents of offal, unpasteurized milk, unpasteurized milk products) to swine is unlawful.

INDUSTRIAL USES

Food waste is increasingly being used to generate biofuel, bio-products and energy.

- **Anaerobic Digestion:** As described in Chapter 4, anaerobic digestion is the biological breakdown of organic waste in the absence of oxygen. The anaerobic digestion process produces biogas that can be used as fuel to generate steam and electricity.
- **Fats, Oils and Grease (FOG):** FOG is typically collected from generators, such as restaurants, and delivered to either a rendering plant (producing animal food, cosmetics, soap and other products), an anaerobic digester or a facility to be converted to biodiesel fuel. FOG also can be added to anaerobic digesters to generate biogas. When FOG is converted to biodiesel fuel, it is a cleaner alternative to conventional diesel fuel. The City of Columbia (City) collects cooking oil and delivers it to Midlands Biofuels, where it is converted into biodiesel. The City uses the biofuel to power one of its garbage trucks as well as other vehicles.

COMPOSTING

As described in Chapter 4, food waste can be combined with other plant material such as dry leaves to decompose over time to form compost, a soil amendment.

In South Carolina, food waste is considered a Category II feedstock meaning it has a lower carbon-to-nitrogen ratio than Category I (leaves and grass) and it has a higher moisture content and is more likely to contain pathogens.

Resources for Reducing Food Waste

Don't Waste Food SC has several resources for easy ways to reduce the amount of food waste created daily, including:

- **Tip sheets;**
- **Product-dating information;**
- **Food waste reduction and composting guides;**
- **Shopping lists; and**
- **Donation resources.**

Visit www.scdhec.gov/dontwastefoodsc for these and more resources.



Category II feedstock includes the following types of food wastes:

- **Non-meat food processing waste**, including marine shells and dairy processing waste;
- **Produce and non-meat food preparation generated by wholesale, retail or food service businesses**; and
- **Plate scrapings**, including cooked meats generated by food service establishments.

Food waste can be incorporated into small compost piles if routinely turned to ensure the food waste won't cause odor or attract insects or animals. For large-scale composting operations, food waste is an acceptable feedstock for aerated windrow, aerated static pile and in-vessel composting systems.

Colleges/universities can help spur the recovery of food waste. Composting and source reduction of food waste can benefit colleges/universities by:

- **Reducing the amount of waste sent to a landfill;**
- **Helping save money by reducing the frequency of garbage collection and/or the number of dumpsters needed on campus;**
- **Instilling the habit of recognizing and separating food waste at every point and time of disposal on campus;**
- **Creating a beneficial product that improves soil quality while reducing fertilizer and pesticide use; and**
- **Reinvigorating conventional recycling programs and awareness of waste reduction.**

Students and staff can be encouraged to compost their food waste by:

- **Informing them of available resources;**
- **Providing composting bins wherever landfill and recycling bins are present;**
- **Regularly publicizing the college/university's composting practices;**
- **Hosting waste-free lunch days where all waste is reduced, recycled or composted; and**

- **Teaching students and staff about composting through presentations, events and tours**, whether on campus or at a commercial site.

As with any waste, businesses must pay to dispose of uneaten food. It is therefore preferable to reduce the amount of food waste generated at the source, as opposed to disposing of it in a landfill. Campus dining facilities and canteens can employ strategic measures to reduce food waste and therefore lower costs.

LANDFILL/INCINERATION

Disposal and/or incineration should be the last resort for food waste management.

Tools for Assessing Wasted Food

EPA offers several assessment tools for food service establishments to measure and track food waste.

- **"Food Waste Assessment Guidebook"**
- **Toolkit for Reducing Wasted Food and Packaging**
- **Food Waste Management Cost Calculator**
- **Paper Tracking Waste Logs**
- **Waste Reduction Model (WARM)**

View these resources at www.epa.gov/sustainable-management-food/tools-assessing-wasted-food.

Federal Food Waste Reduction Challenges

EPA's Food Recovery Challenge offers opportunities for businesses and organizations to join as participants or endorsers. EPA provides free technical assistance to help businesses reduce the amount of food waste they generate. Participants and endorsers are listed on EPA's website, and regional and national awards are given. For more information, please visit www.epa.gov/sustainable-management-food/food-recovery-challenge-frc.

References & Resources for Chapter 5

- Bill Emerson Good Samaritan Food Donation act, media.law.uark.edu/arklawnotes/2013/08/08/the-legal-guide-to-the-bill-emerson-good-samaritan-food-donation-act/
- City of Columbia, Cooking Oil to Biodiesel, columbiasc.net/solid-waste/cooking-oil
- Don't Waste Food SC, www.scdhec.gov/dontwastefoodsc
- **EndFoodWasteNow.org** (Facts and Research about Food Waste), www.gracelinks.org/2244/food-waste
- **EndFoodWaste.org**, The @UglyFruitAndVeg Campaign, www.endfoodwaste.org/ugly-fruit---veg.html
- EPA, Food Waste Recovery Hierarchy, www.epa.gov/sustainable-management-food/food-recovery-hierarchy
- Feeding America, www.feedingamerica.org
- Fields to Families, www.fieldstofamilies.org
- Food Donation Connection, www.foodtodonate.com
- Food Recovery Network (Resources and Information about Food Donation Programs), www.foodrecoverynetwork.org
- Food Waste Reduction Alliance, www.foodwastealliance.org
- Loaves & Fishes, www.loavesandfishesgreenville.com
- Move for Hunger, Start a Food Drive, www.moveforhunger.org/get-involved/food-drive/
- Natural Resources Defense Council, www.nrdc.org
- Save the Food, www.savethefood.com
- S.C. Farm to Institution, scfarmtoinstitution.com
- Second Helpings, www.secondhelpingslc.org/our-food-network/food-donors
- S.C. Code of Laws, Liability Exemption for Donors of Food, www.scstatehouse.gov/code/t15c074.php
- S.C. Solid Waste Policy and Management Act of 1991, www.scstatehouse.gov/code/t44c096.php
- U.S. Composting Council, "Best Management Practices (BMPs) for Incorporating Food Residuals into Existing Yard Waste Composting Operations," compostingcouncil.org/admin/wp-content/uploads/2010/09/BMP-for-FW-to-YW.pdf
- USDA, Food Loss and Waste, www.usda.gov/foodlossandwaste
- Waste Free Kitchen Handbook: A Guide to Eating Well and Saving Money by Wasting Less Food, www.nrdc.org/stories/freeze-more-waste-less

Managing Banned Items

CHAPTER 6

What is banned?

The S.C. Solid Waste Policy and Management Act of 1991 (Act) – S.C. Code of Laws §§ 44-96-10 et seq. – bans six items from landfill disposal:

1. **Used motor oil** (Section 44-96-160) (A) (1);
2. **Used oil filters** – unless crushed to the smallest practical volume or “hot drained,” according to South Carolina’s used oil regulation (Section 44-96-160 (B) and S.C. Regulation, R.61-107.29);
3. **Waste tires** – whole tires (Section 44-96-170) (G);
4. **Lead-acid batteries** (e.g., car, truck, boat) (Section 44-96-180) (L) (2);
5. **Yard trimmings** – which can be disposed of in Class 1 or Class 2 landfills (Section 44-96-190) (B); and
6. **Large appliances** – referred to as “white goods” in the Act (Section 44-96-200) (B).

The S.C. Manufacturer Responsibility and Consumer Convenience Information Technology Equipment Collection and Recovery Act – S.C. Code of Laws §§ 48-60-05 et seq. – bans specific consumer electronics from landfill disposal. The electronics are **computers, computer monitors, printers and televisions**.





Used Motor Oil

Used motor oil is not only banned from disposal in South Carolina landfills, it also is illegal to dispose of in sewers, drainage systems, septic tanks, surface water, groundwater and on the ground. In addition, oil may not be used for road oiling, dust control, weed abatement or other applications that may cause harm to the environment. In short, used motor oil **MUST** be recycled.



There is a statewide contract that colleges/universities can elect to use to recycle used motor oil. Used motor oil filters and bottles also can be collected by colleges/universities. According to the state's used oil regulation (R. 61-107.279), used motor oil filters are banned from MSW landfills unless they are "hot-drained for a minimum of 12 hours" or "compacted to their smallest practical volume." The collection of used motor oil filters is an important part of the overall recycling program because filters can contain 4 ounces to 1 quart of oil. Most of the filters recycled in South Carolina are sent to steel mills.

Oil bottles are an important target for recycling because they are made from a plastic [e.g., high-density polyethylene (HDPE)] that is recyclable and can contain as much as 1 ounce of oil per bottle that should be recovered.

COLLECTING & STORING USED MOTOR OIL

Collection tanks should be set up to accept:

1. **Used motor oil;**
2. **Gasoline/used motor oil mixtures; or**
3. **Used motor oil generated on farms.**

Campus recycling facilities operate as collection points for used oil, used oil filters, antifreeze and related waste. There is a statewide contract in place for this material to be picked up and recycled.

It is important to note that a variety of petroleum products, including kerosene, transmission fluid and diesel fuel may be able to be placed in the tanks. Gasoline, however, can only be placed in the gasoline/used motor oil mixture tanks. Have a discussion with your used oil recycler about what is acceptable in each collection tank.

There are several recommendations to consider when storing used motor oil. Specifically, collection tanks must be:

- **Placed on concrete pads or paved areas;**
- **Under cover to prevent runoff from rainfall or spills that could contaminate surrounding land; and**
- **Labeled clearly and appropriately.**

Tanks should be located where staff is present and access is restricted.

COLLECTION OF OIL/GASOLINE MIXTURES

Oil/gasoline mixture collection sites are designed to accept motor oil, gasoline and oil/gasoline mixtures from lawn equipment and recreational vehicles (e.g., leaf blowers, boats, motorcycles). The sites also accept the same petroleum products as standard used oil collection tanks. Oil/gasoline mixture tanks typically hold 500 gallons, but 275-gallon tanks also are available.

The requirements for establishing an oil/gasoline mixture collection site are more stringent than for typical used motor oil collection sites. In particular, oil/gasoline mixed sites must:

- **Meet the requirements of the National Fire Protection Association (NFPA) Codes and Standards; and**
- **Be approved by a local fire marshal or the Office of the State Fire Marshal.** The fire marshal can provide a copy of the NFPA Codes and Standards.

Why recycle oil?

- **Recycling used motor oil protects human health and the environment.** Recycling used motor oil keeps it from contaminating soil, rivers, lakes, streams, groundwater and beaches, thereby helping to protect aquatic life and wildlife. One gallon of used motor oil improperly disposed of may contaminate 1 million gallons of fresh water – enough to supply 50 people with drinking water for one year.
- **Recycling used motor oil saves energy.** Two gallons of used motor oil can generate 36 kilowatt-hours of electricity. That's enough to run an average household for a day, cook 36 meals in a microwave, use the blow dryer 216 times, vacuum the house for 15 months or run a television for 180 hours.
- **Recycling used motor oil also helps to use fewer natural resources.** Used motor oil can be reprocessed and used: in furnaces for heat; in power plants to generate electricity; and as lubricating oils.

COLLECTION OF OIL FROM SMALL FARMS

According to South Carolina's used oil regulation (R. 61-107.279), farms are considered generators of used motor oil and, as a result, must follow certain management practices.

- **Farms that generate more than 25 gallons of used motor oil in a month** must store the oil in a container with no leaks or visible rusting. The container must be labeled "Used Motor Oil."
- **Used motor oil from farm machinery is not considered DIYer used motor oil** and may not be collected in DIY tanks.
- **Farmers who transport more than 55 gallons of used motor oil at any time must register** with the S.C. Department of Health and Environmental Control's (DHEC) Division of Compliance and Enforcement. Please call (803) 898-0495 for more details.

Farms that generate an average of 25 gallons or less of used motor oil per month from vehicles or machinery in a calendar year are not subject to the requirements of this regulation, but they should follow best management standards and practices in handling used motor oil.

To assist with the proper management of used motor oil generated on farms, DHEC's Office of Solid Waste Reduction and Recycling (Office) continues to encourage colleges/universities to establish used motor oil recycling sites if their farms generate 25 gallons of used motor oil per month or less.

Agricultural oil tanks are designed to accept the larger quantities of oil that farmers generate. The tanks typically hold 600 gallons of used motor oil. They are fitted with a pump and hose in an effort to make it easier for farmers to deliver up to 55 gallons of used motor oil at one time. Agricultural oil tanks are capable of accepting the same petroleum products as a standard used oil collection tank.



Used Motor Oil Filters

As explained earlier, used motor oil filters are banned from landfill disposal "unless the filter has been crushed to the smallest practical volume or unless the filter has been hot drained." Many colleges/universities collect used motor oil filters from fleet management services and other vehicles used on campus, store them in 55-gallon drums and work with a vendor for final management (recycling). Colleges/universities that collect the filters are required to have the 55-gallon drum on a concrete pad and covered – usually located next to the used motor oil tank.

There is a state-term contract available to manage used motor oil filters. Colleges/universities that use the contract do not need to drain or crush used oil filters prior to collection.

EMPTY MOTOR OIL BOTTLES

Empty motor oil bottles are typically collected in one of two ways:

1. **Collected in 55-gallon drums placed next to the used motor oil tank.** It is recommended that drum covers be placed on the 55-gallon drums; or
2. **With other HDPE plastic bottles**, after drained for a minimum of six to eight hours, using oil bottle drain racks (pictured below).

Oil bottle drain racks:

- **Consist of a series of perforated PVC pipes mounted to a metal frame** that securely hold the neck of each bottle in place;
- **Are typically designed to drain multiple oil bottles at a time** and collect the residual oil for recycling; and
- **Should not be used to drain oil bottles overnight.**

Did You Know?

IMPROPERLY DRAINED OIL BOTTLES can:

- **Contaminate other plastic with oil;**
- **Present a safety hazard** (oil slicks on the material recovery facility or market warehouse floor); and
- **Interfere with the detergents used to wash the plastic once it is ground.**

3

Waste Tires

The Act bans whole waste tires from landfills and requires retailers to collect a \$2 fee for each new tire sold. The revenue

from the tire fee is split among the counties, new tire retailers and DHEC and is used to ensure that waste tires are properly managed and recycled.



Improper disposal of waste tires is problematic in many ways, including the following.

- **Illegally disposed tires are a nuisance, a visual blight and a potential public health hazard** as they are breeding grounds for insects (especially mosquitoes).
- **Illegally disposed tires present a fire hazard**, especially if dumped in large quantities.
- **When buried whole in landfills, tires tend to rise to the surface and become exposed**, causing operational and safety issues.

Colleges/universities should use an approved waste tire recycling vendor to manage used tires.

Off-road tires and heavy-duty truck tires purchased by colleges/universities can be retreaded in order to extend their useful lives and save on the cost of tire replacement.

LEGAL REQUIREMENTS OF WASTE TIRE HAULERS & PROCESSORS

The state's waste tire regulation (R. 61-107.3) addresses most waste tire activities. Some basic requirements of haulers and processors include:

- **In general, any entity that hauls more than 120 waste tires per year must be registered** as a waste tire hauler and report annually to DHEC;
- **Unless otherwise exempted, tire collection sites are required to have a waste tire collection permit.** Permitted solid waste facilities that store less than 2,500 tires are not required to have a collection permit;
- **No permitted or exempted facility may store tires in excess of 30 days;**
- **All waste tires must be stored so as to prevent and control mosquitoes** and other human health nuisances; and
- **Records should be kept of the pest control activities** and be made available upon request.

DHEC encourages colleges/universities to collect waste tires in such a way as to keep them dry and clean. The use of some combination of concrete pads, containers, trailers, buildings and/or other cover is strongly recommended.

4

Lead-Acid Batteries

Lead-acid batteries are used in automobiles, trucks, boats and motorcycles. As with most banned items in South Carolina, there is an advanced recycling fee on the sale of

lead-acid batteries to help fund the recovery and recycling of this material. When purchasing a new lead-acid battery a customer pays a \$7 recycling fee; if the customer turns in an old battery when purchasing a new one, the customer pays a \$2 recycling fee. Retailers of lead-acid batteries, therefore, must accept the spent battery upon purchase of a new one.

COLLECTING & STORING LEAD-ACID BATTERIES

- **Collection:** Colleges/universities departments choosing to collect lead-acid batteries should provide a clearly designated storage area. Batteries should be handled with care and inspected for leakage.
- **Storage:** Lead-acid batteries should be stacked upright on pallets or placed in containers. They are heavy and should not be stacked too high or

placed in too large of a container. They should be stored:

- **On pallets or cement pads;** and
- **Protected from the weather** such as under a carport cover or other shelter.

Pallets should be shrink wrapped to protect the integrity of the load and further protect the batteries from rainfall as any acid leaking on the outside of the batteries could contaminate run-off. Collection areas should be monitored and no smoking should be allowed in these areas.

POTENTIAL MARKETS

Generally, markets for lead-acid batteries are plentiful. Scrap metal dealers often will accept lead-acid batteries for recycling. More than 97 percent of all battery lead is recycled. A typical new battery contains 60 to 80 percent recycled lead and plastic (polypropylene). Usually a scrap metal recycler will pick up the lead-acid batteries from the collector, extract the lead and then sell the empty casings to plastic recyclers. Some large lead-acid battery manufacturers and distributors have established their own recycling services.

5

Yard Trimmings

Yard trimmings and land-clearing debris are banned from disposal in Class 3 landfills. More information about this material is discussed in Chapter 4.

6

Large Appliances

Large appliances (also known as white goods) are defined in the Act to include refrigerators, stoves, water heaters, freezers, dishwashers, trash compactors, washers, dryers, air conditioners and commercial large appliances. All are banned from disposal in MSW landfills. To promote the recycling of large appliances, there is a \$2 advanced recycling fee.

Appliances are easily recycled – saving considerable landfill space – and are a valuable commodity. Nationwide a vast infrastructure has been developed around the recycling of end-of-service steel appliances as well as other steel material.

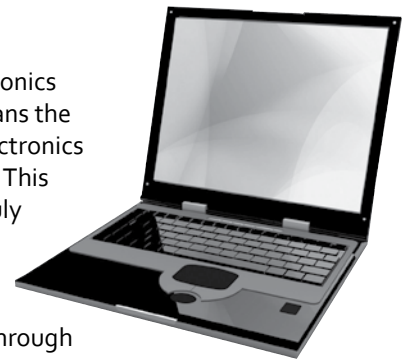
On college/university campuses, some appliances are left behind by students who do not want to store or move them. Options for managing appliances, depending on their condition/size, include:

- **Storing them in a warehouse/empty building** until the fall, then reselling them to students;
- **Reusing them somewhere else on campus.** Email blasts, bulletin boards and clearinghouse websites can facilitate this process; or
- **Donating them to a non-profit organization** (e.g., Goodwill, Habitat for Humanity ReStore).



Electronics

South Carolina’s electronics recycling legislation bans the disposal of specific electronics in solid waste landfills. This ban went into effect July 1, 2011. The legislation (Section 48-60-140) requires that electronics collected through college/university programs must be recovered in a manner that complies with all applicable federal, state and local requirements.



If, for some reason, a college/university cannot use the state contract for electronics recycling, they must use a recycling vendor (reclaimer) that – at a minimum – complies with the responsible recycling practices (R2) or other comparable industry or governmental standards. DHEC recognizes reclaimers that have either: 1) R2; or 2) e-Stewards certification.

For links to processors that meet each of these sets of standards, please visit www.scdhec.gov/sites/default/files/Library/OR-1175.pdf.

Recycling coordinators should focus on providing clear and consistent outreach to students and staff about which commodities are banned from landfill disposal and why. It also is important to note that banned items can be counted when calculating recycling rates, so it is important to track the weight of this material.

As with all other state-owned property, electronics housed within state-supported colleges/universities must be managed through the surplus property process. If cleared by the S.C. Department of Administration’s Surplus Property Office, colleges/universities should manage electronics through the state-term contract for electronics recycling.

MANAGING ELECTRONICS COLLECTION SITES

South Carolina’s electronics legislation does not address the operation of collection sites for colleges/universities, but does require (Section 48-60-140) that recycling vendors follow the industry’s best management practices for collection and storage of electronics.

Given that, it is recommended that colleges/universities follow best management practices as outlined by the Electronics Recycling Coordination Clearinghouse.

HOW TO MINIMIZE & PROPERLY MANAGE ELECTRONICS

- **Purchase electronic equipment that can be easily upgraded and/or recycled.** Check the Electronic Product Environmental Assessment Tool (EPEAT) website. The program covers desktop and laptop computers, computer monitors, printers and imaging devices. Visit www.epeat.net for more information.
- **Consider leasing arrangements for electronics.** Many leases include proper end-of-life management for computers and other electronics. Please see the state contract listing for IT equipment leasing.
- **Consider donating working electronics to charities** (if permitted by the Surplus Property Office). Charities typically have certain specifications under which they will accept electronics. Check before donating.
- **Obtain recycling services through an electronics recycler.** Be sure to ask for documentation regarding the final disposition of the material and ensure that agency data destruction requirements are met. These requirements are typically met when using the state contract.

Please visit www.scdhec.gov/e-cycle to learn more about where to recycle e-scrap.

E-Cycle South Carolina

DHEC has developed a web-based clearinghouse of information on electronics recycling. The website provides information for residents, local governments, manufacturers, landfill owners/operators, retailers and others.



To learn more about electronics recycling in South Carolina, please visit www.scdhec.gov/e-cycle.

References & Resources for Chapter 6

- DHEC, E-Cycle South Carolina, www.scdhec.gov/e-cycle
- DHEC, Solid Waste Landfills and Structural Fill, <https://live-sc-dhec.pantheonsite.io/sites/default/files/media/document/R.61-107.19.pdf>
- DHEC, SWM: Waste Tires, www.scdhec.gov/environment/recycling-waste-reduction/waste-tires
- DHEC, Used Oil Regulations – R.61-107.279, <https://live-sc-dhec.pantheonsite.io/sites/default/files/media/document/R.61-107.279.pdf>
- Electronics Recycling Coalition Clearinghouse, www.ecycleclearinghouse.org
- EPEAT, www.epeat.net
- Green Resource Index, www.scdhec.gov/sites/default/files/Library/OR-1715.pdf
- S.C. Code of Laws, Title 48, Chapter 60, South Carolina Manufacturer Responsibility and Consumer Convenience Information Technology Equipment Collection and Recovery Act, www.scstatehouse.gov/code/t48co60.php
- S.C. Solid Waste Policy and Management Act of 1991, www.scstatehouse.gov/code/t44co96.php
- Steel Recycling Institute, Appliance Recycling, www.steelsustainability.org

Managing Miscellaneous Items

CHAPTER 7

Miscellaneous items are items commonly found in collegiate recycling programs that often are more difficult to manage than “traditional recyclables” (e.g. aluminum cans, cardboard, glass, plastic bottles).

Examples of miscellaneous items include:

- **Antifreeze;**
- **Cooking oil;**
- **Fluorescent bulbs;**
- **Hazardous household material** (e.g., household cleaners);
- **Mattresses;**
- **Paint;** and
- **Rechargeable batteries.**



All of these items are considered municipal solid waste (MSW) and count toward South Carolina’s MSW recycling rate. Miscellaneous items, in fact, made up 5.7 percent (more than 75,000 tons) of all of the material recycled in fiscal year (FY) 2017 (July 1, 2016 to June 30, 2017) according to the S.C. Solid Waste Management Annual Report for FY17.

Antifreeze can NOT be mixed with used motor oil.

While the S.C. Department of Health and Environmental Control’s (DHEC) Office of Solid Waste Reduction and Recycling (Office) encourages colleges/universities to establish antifreeze collection programs, antifreeze must be collected as a separate commodity. Antifreeze cannot be mixed with used motor oil or oil/gasoline mixtures. If mixed, oil and oil/gasoline vendors will not accept the material.



Antifreeze

Antifreeze – which is made of ethylene glycol, water and corrosion inhibitors – is extremely toxic. (A less toxic alternative, made with propylene glycol, should be encouraged.) Once used, waste antifreeze may contain lead, cadmium and chromium. Antifreeze should never be disposed of on the ground, into storm drains or in surface water (e.g., rivers, lakes, ponds) because it can harm people, animals and the environment.



Recycling antifreeze helps reduce improper disposal into the environment. It also saves money because:

- **Disposal costs are avoided;** and
- **Cleanup and liability costs for improper disposal are avoided.**

The state-term contract used to manage used oil and oil filters also includes antifreeze management. For more information, see www.procurement.sc.gov.

COLLECTION OF ANTIFREEZE

Antifreeze must be collected in a secure container – 55-gallon drums with lids can be used. Collection containers should be placed on concrete pads or paved areas and protected by a cover (e.g., carport cover, other protective structure).

Due to the toxicity of waste antifreeze, if collected on campus, the employee responsible should be instructed to monitor the collection containers as well as contain and clean up any spills.



Unless refining the antifreeze on-site for reuse, state-supported colleges/universities that collect antifreeze are required to use the state-term contract for collection of the material.

Cooking Oil

College/university campuses include dining halls and other food establishments that produce used cooking oil/grease year round. Properly managing this waste provides the opportunity to avoid disposal (and costs) that often has severe impacts on sewer systems. In addition, cooking oil/grease can be used as a raw material in other products and also can be made into an alternative fuel for vehicles.



COLLECTION OF COOKING OIL

Colleges/universities are encouraged to set up a recycling program and work with a private vendor to manage this material. Recommendations on setting up a cooking oil collection program include:

- **Cooking oil must be collected in a secure container.** Fifty-five-gallon drums with lids can be used.
- **Collection containers should be placed on concrete pads or paved areas and protected by a cover** (e.g., carport covers, other protective structures).
- **Ensure that cooking oil is free of residue and not mixed with any other liquids.**
- **Regularly monitor the site to be sure the container is secure and any spills are cleaned up.**

The service provider that collects the used cooking oil may provide their preferred containers to be placed at designated recycling sites. Colleges/universities may provide their own collection containers as well. Depending on the proximity of the campus to the service provider's headquarters, costs may range from zero to minimal.

Fluorescent Bulbs

Fluorescent bulbs have been used in homes, offices and public buildings for many years. They last much longer than incandescent bulbs – saving money in the long run – and use about one-fourth the energy. They contain small amounts of mercury, however, and must be properly managed.



COLLECTION OF FLUORESCENT BULBS

Some colleges/universities collect fluorescent bulbs and compact fluorescent lamps (CFLs) as part of their collection programs.

In general, recyclers of fluorescent bulbs provide collection boxes (usually at a cost) for the bulbs. Recyclers may provide boxes with pre-paid postage or run collection routes to pick up filled boxes. There are several South Carolina-based recyclers of fluorescent bulbs. For more information about recycling fluorescent bulbs, please visit www.scdhec.gov/recycle and select "Hard to Manage Items."

The Green Resource Index also provides a list of companies that manage fluorescent bulbs. The Index is available at www.scdhec.gov/sites/default/files/Library/OR-1715.pdf.



Mattresses

Managing mattresses at the ends of their useful lives can be challenging for anyone, but for colleges/universities that house hundreds or thousands of students, residents or inmates (and therefore hundreds or thousands of mattresses), the challenge is even greater. Mattresses are bulky and difficult to compact, preventing landfills from achieving optimal air/space density. Alternatively, recycling mattresses and box springs involves separation and baling/selling of components. For example:

- **Polyester Fabric** – baled and recycled into rags;
- **Foam/Cotton** – recycled into new products such as carpet padding and other textiles;
- **Wood Framing** – chipped and used as fuel or mulch; and
- **Metal** – sold to recyclers.

Some recyclers report that they recycle 90 to 94 percent of the material they recover from mattresses. Some mattress recyclers collect material from a wide geographic range – even nationally.

When issuing a request for proposal on new mattresses, colleges/universities can request that bidders include recycling services in their prices. If this isn't possible, they can collect the used mattresses and enlist a mattress recycler to handle them. Some mattress recyclers operating in South Carolina include the following businesses.

- Nine Lives Mattress Recycling, Pamplico, SC – www.ninelivesmattressrecycling.com
- Bedex, Greensboro, NC – www.bedex.net
- Mattress Recycling Council – www.mattressrecyclingcouncil.org/recycling/recycling-locations/



Paint

Unwanted latex and oil-based paint often can be used by another department or by individuals and organizations in the community. Collegiate programs always should follow basic best management practices when handling paint.

Programs should:

- **Identify leftover paint as latex or oil-based;**
- **Place collected paint cans on pallets, concrete pads or paved areas that are protected by a cover** (e.g., carport cover). Do not store latex paint outside or in unheated areas. Frozen latex paint cannot be reused;
- **Open cans in well-ventilated areas;** and
- **Wear appropriate respirator or cartridge mask when pouring or mixing large volumes of oil-based paints.**



If the paint is no longer useable or no other reuse options exist, unwanted latex paint can be disposed of as part of the “regular” trash if dry. For individual cans, remove the lid and allow the paint to air dry (harden) completely. Cat litter, shredded newspaper, sawdust and sand may be added to the paint to speed the drying process. For larger amounts, pour a one-inch layer of paint into a cardboard box lined with a plastic bag. Add cat litter or other drying material and stir occasionally to speed drying. Once completely dry, dispose of in trash. Remember to recycle empty paint cans.

Like latex paint, oil-based paint is best handled through donation to a community swap shop or a local organization. Otherwise, oil-based paint should be included in a hazardous household waste collection program.

For a listing of paint recyclers, see the S.C. Department of Health and Environmental Control's (DHEC) Green Resource Index at www.scdhec.gov/sites/default/files/Library/OR-1715.pdf.

Rechargeable Batteries

Rechargeable batteries are used for many electronics – from computers and cell phones to power tools.

Call2Recycle, Inc. collects used rechargeable batteries and cell phones for recycling at no charge to the consumer.

The program provides recycling coordinators with three options:

1. **Set up free collection programs in their collection areas or in campus buildings;**
2. **Encourage others** (e.g., businesses, schools, others) to set up collection sites; and
3. **Refer students and staff to the network of established collection sites available at national retail outlets** (e.g., home improvement stores).

Many retailers of office supplies, cell phones and home improvement wares collect rechargeable batteries and cell phones for recycling through the Call2Recycle program. This program provides recycling coordinators with the opportunity to educate staff and students about how to find a drop-off location or to develop their own drop-off site by signing up with Call2Recycle as a collection partner.

Whether the program collects this material or not, college/university recycling coordinators should provide promotional material to make students and staff

Managing Hazardous Household Products

Hazardous household products are those that contain at least one hazardous substance and pose a threat to human health and the environment. These products are considered to be hazardous because they have one or more of the following characteristics.

- **Flammable** – can easily be set on fire.
- **Corrosive or Caustic** – can cause burns.
- **Explosive or Reactive** – can explode if exposed to heat, sudden shock or pressure.
- **Toxic or Poisonous** – can cause injury or death through ingestion, inhalation or absorption through the skin.

Typical hazardous household products (which often later comprise HHW) include:

- **Lawn/Garden Care Products** – Fertilizer, pesticide, insecticide, fungicide, herbicide and weed killer;
- **Paint and Paint-Related Products** – Latex paint, oil-based paint, turpentine, paint stripper, rust remover, paint thinner and varnish;
- **Automotive Fluids and Batteries** – Used motor oil and filters (recycled in South Carolina), gasoline, diesel fuel, kerosene, auto body repair products, windshield washer solution, antifreeze, brake and transmission fluid, lead-acid batteries (also recycled in South Carolina, through retailers and other outlets) and metal polish;
- **Beauty Products and Medicine** – Alcohol-based lotions, rubbing alcohol, medicine, nail polish and nail polish remover, hair relaxers, dyes and permanents, hair sprays and aerosol deodorants;

- **Household Cleaners** – Ammonia-based cleaners, oven and drain cleaners, floor care products, aerosol cleaners, window cleaners, furniture polish, metal polish as well as tub/toilet cleaners; and
- **Miscellaneous** – Mercury thermometers, photographic chemicals, lighter fluid, shoe polish, fiberglass epoxy, swimming pool chemicals, mothballs and glue.



What can collegiate recycling coordinators do?

- **Provide and/or advertise collection opportunities of HHW;**
- **Offer some items** (especially low-risk items like latex paint) **for reuse in a “swap shop;”**
- **Identify organizations that will accept “leftover” or unused HHW** (some may only accept unopened products) **and inform staff of what items can be donated where and in what condition;**
- **Provide additional information** (e.g., online tools such as Earth 911) **about other recycling opportunities;** and
- **Encourage staff and students to use non-hazardous alternatives and provide information about such options.** Examples include:
 - www.epa.gov/saferchoice; and
 - www.ecologyactioncenter.org/waste-and-recycling/hhw-alternatives/.

aware that rechargeable battery recycling is easy and environmentally beneficial.

Single-Use Batteries

Single-use batteries (e.g., alkaline, zinc carbon) can be recycled, but options are limited and sometimes come with a cost. If collecting batteries, programs are encouraged to follow all manufacturer safety guidelines to limit risks to human health and the environment.



Today's alkaline and zinc carbon batteries are required by law to have zero-added mercury and are primarily comprised of common metals such as steel, zinc and manganese. While single-use batteries can be thrown away as part of the "regular" waste stream, campuses are encouraged to develop and offer programs if cost-effective.

Always look for any state and regional recycling options, but also consider national mail-in programs such as Battery Solutions (www.batterysolutions.com) or The Big Green Box (www.biggreenbox.com). Also visit www.earth911.com/recycling-guide/how-to-recycle-single-use-batteries/.

References & Resources for Chapter 7

- Battery Council International, batterycouncil.org/?page=Battery_Recycling
- Call2Recycle, Inc., www.call2recycle.org
- DHEC, "Where to Recycle Locally," www.scdhec.gov/HomeAndEnvironment/Recycling/WheretorecycleLocally/
- Earth911 Battery Single-Use Battery Recycling Locator, www.earth911.com/recycling-guide/how-to-recycle-single-use-batteries/
- Earth911 Recycling Center Search (includes batteries, CFL bulbs, electronics, scrap tires, appliances, paint (by type and other chemicals), car batteries, motor oil, antifreeze, hazardous material and more), search.earth911.com/
- EPA, CFL Information, www.epa.gov/cfl
- EPA, Safer Choice, www.epa.gov/saferchoice
- EPA, Hazardous Waste, www.epa.gov/hw
- Green Resource Index, www.scdhec.gov/library/OR-1403.pdf
- The Home Depot, CFL Light Bulb Information, www.homedepot.com/c/how_to_choose_right_compact_fluorescent_light_bulb_HT_BG_EL
- The Home Depot, Store Locator, www.homedepot.com/StoreFinder/index.jsp
- Lowe's, CFL Recycling, www.lowes.com/cd_recycling_368967519_
- Lowe's, Store Locator, www.lowes.com/StoreLocatorDisplayView?storeId=10151&langId=-1&catalogId=10051
- Mattress Recycling Council, mattressrecyclingcouncil.org/programs/
- S.C. Hazardous Waste Management Act, www.scstatehouse.gov/code/t44c056.php
- S.C. Solid Waste Policy and Management Act of 1991, www.scstatehouse.gov/code/t44c096.php
- Steel Recycling Institute, Appliance Recycling, www.steelsustainability.org

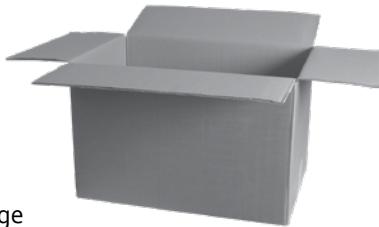
Managing Construction & Demolition Debris

CHAPTER 8

Construction and demolition (C&D) debris is the waste generated from the construction, remodeling, repair and deconstruction of homes, buildings, roads, bridges and drainage/sewage systems. C&D debris may include bricks, concrete, wood, asphalt (from shingles and roads), glass, metal, plastic, plumbing fixtures, gypsum (the main material in drywall) and roofing as well as debris associated with land clearing and natural disasters.

Other waste generated at C&D sites includes:

- **Waste from finishing processes** such as caulk tubes and paint cans;
- **Insulation** – both rigid foam (e.g., polystyrene) and batts (e.g., fiberglass);
- **Cardboard;**
- **Glass;**
- **Wiring;** and
- **Worker-generated items** such as beverage containers and food packaging.



C&D debris is not considered municipal solid waste (MSW) in South Carolina and does not count toward the state's

MSW recycling rate. Waste reduction and recycling of C&D debris, however, are important components in the management of this material. Avoiding disposal of C&D debris can result in reduced disposal costs to generators, reduced environmental impacts and positive economic impacts.



While recycling is encouraged, C&D debris may be disposed of in MSW landfills. Permitted C&D and land-clearing debris (LCD) landfills in South Carolina accept various types of C&D debris that has not come into contact with hazardous or toxic components (e.g., petroleum products, solvents, pesticides, herbicides, preservatives, polychlorinated biphenyls – also known as PCBs).

C&D debris is often disposed of in Class 2 (C&D) landfills in South Carolina, which can be less costly than disposal in MSW (Class 3) landfills. These cost savings, however, may be offset by other market factors.

Household garbage, electronics (e.g., televisions, computers), fluorescent bulbs, railroad ties and utility poles are not accepted at Class 2 landfills.

Why focus on C&D debris?

Although diverting C&D debris does not help the state's MSW diversion goals or per-capita disposal goals, it:

- **Presents a significant diversion opportunity.** Although C&D activities vary considerably with economic conditions, C&D debris is generally a large portion of waste generated and the majority of C&D debris can be recycled or reused;
- **Reduces waste management costs.** In many cases recycling and reusing material generated from C&D activities may reduce hauling and disposal costs;
- **Saves natural resources and reduces greenhouse gas emissions.** As with other recyclables, the recycling (and source reduction) of C&D debris results in a reduced need for harvesting or mining natural resources;
- **Can be practical.** Since C&D debris is non-putrescible and generally consists of dry waste, it can be practical to sort and store on site. Specific material types are often generated during a particular phase of a project and are, therefore, not difficult to segregate. This is especially the case with construction projects; and
- **Can be a visible commitment to sustainability.** When colleges/universities implement source reduction and recycling activities at public C&D project sites, they send a positive, often highly visible message to the community that they are committed to sustainability.

Going Local

One advantage of C&D debris is that markets for this material are typically local or regional in nature. This means that recycling C&D debris can stimulate the local economy. In addition, collegiate recycling professionals can help the local community by encouraging the recycling of C&D material produced on campus.

Examples include:

- **Promoting C&D debris reduction strategies and providing resources so they can be easily implemented;**
- **Providing information about C&D debris that can be recycled or reused and organizations as well as businesses that will accept this material;**
- **Developing or providing “tool kits” (e.g., material calculators, case studies, best management practices) and training to help project managers set up successful recycling programs and minimize waste;**

- **Helping project managers determine the proper size of recycling containers; and**
- **Encouraging the college/university to adopt policies that support enhanced C&D debris recycling.**

Targeting C&D Debris for Recycling

Material to target at a job site should be:

- **Available in relatively large quantities;**
- **Easy to separate, store and protect;**
- **Easy to market locally; and**
- **Problematic to dispose of.**

Recovering C&D Debris for Recycling

Depending on available markets, material may be segregated into different containers for pick-up by different vendors or may be commingled and picked

C&D Debris Source Reduction Strategies

There are many opportunities for on-site source reduction of C&D debris. Recycling coordinators can encourage project managers to adopt these strategies when work is done on campus.

- **Use standard lumber sizes to minimize cut-off waste.**
- **Use prefabricated or modular wall sections and trusses to reduce waste generated on site.**
- **Measure carefully to avoid waste.**
- **Consider using steel framing as an alternative to wood.** (Steel is recyclable, stronger and reduces construction time and costs.)
- **Consider exposing structural elements in order to use (and potentially waste) less material.**
- **Use a computer-assisted design program to optimize plywood and drywall uses.**
- **Purchase standard material that can potentially be used on another project if purchased in excess.**
- **Purchase from suppliers that will allow the purchase of only the quantity needed.**
- **As part of the bid process, ensure that bids for projects require on-site separation of material and stipulate what material or portion must be recycled.** Request documentation.
- **Consider listing excess material on websites and waste exchanges so it can be reused.** If you are a state-supported college/university, be sure to contact the Surplus Property Office to verify whether or not they would prefer to manage the excess material before listing it on any websites/waste exchanges.
- **Consider donating material to Habitat for Humanity’s ReStores for reuse in other projects.** ReStores accept lumber, windows, cabinets, flooring, shingles and other building supplies. See www.habitat.org/restores for locations.

up by one vendor who sorts and markets the individual commodities.

- **While separating material at the job site may be more time consuming and costly than combining material in one container, the increased market value may result in more revenue** – enough to offset some or all of these costs. Commingling material is more likely to lead to accidental or “drive-by” contamination by other material and result in the material having little or no market value.
- **As in other settings, the recycling of C&D debris can lower the cost of solid waste disposal by reducing the number and/or size of dumpsters and the frequency of pick-up needed.** It is important that all containers be labeled clearly, using multiple languages if needed. Also, training of crew may need to occur multiple times as different contractors begin work at the project site.

Outlets for C&D Debris

C&D end markets vary based on the type and quality of material as well as regional markets. Generally the following types of material are marketable.

- **Concrete, Brick, Asphalt & Other Aggregates:** This material can be used on site for: 1) base or fill material; 2) paving applications and cement production; or 3) road construction and maintenance projects.
- **Wood:** Wood may be accepted by mulching operations, composting operations, pallet recyclers, wood pellet producers and pulp mills. It also may be accepted as a fuel for energy generation. Painted and treated wood may not be accepted by recyclers and is not suitable for composting or mulching.
- **Metal** (e.g., pipes, aluminum doors, window frames): These items may be accepted by local metal recyclers and are usually of relatively high value (especially steel, copper and aluminum).
- **Dirt and Sand:** These may be used on site or at other local construction projects.
- **Clean Gypsum Board:** Uses include on-site soil amendment or soil conditioner for agricultural applications. It also can be used by drywall or Portland cement manufacturers.
- **Asphalt Shingles:** This material often can be ground and used as feedstock for asphalt road construction. Shingles are particularly efficient to recycle because they are often the only material generated from certain projects. In most cases, asbestos testing may need to be conducted prior to recycling.

Challenging Material

Some material is challenging to market or may bring about questions. This includes carpet, carpet padding and ceiling tiles.

Carpet

Carpet is a challenging material to manage in the sense that it is voluminous, taking considerable space in dumpsters and landfills. In addition, not all carpet fiber types are recyclable and fiber types cannot be readily identified visually. Therefore, it is challenging to separate recyclable carpet from non-recyclable carpet. Carpet also should be checked for asbestos.



How to Reduce Scrap Carpet

Collegiate recycling professionals can encourage procurement officials, administration and installers to consider the options below in order to reduce the amount of waste carpet generated.

- **Use more durable flooring material or removable, cleanable rugs instead of carpeting.**
- **Select durable types of carpet**, such as low-pile, nylon and carpet with high-fiber density.
- **Install high-quality padding to increase the useful life of carpet.**
- **Use carpet tiles where possible so that only soiled sections of carpet need to be removed.** Some manufacturers of carpet tiles have a mail-back recycling program.
- **Lease carpet.** Some manufacturers and installers offer this service, whereby leases include maintenance, removal and recycling of carpet over its useful life.
- **Purchase refurbished carpet that has been reclaimed from other businesses and institutions, cleaned and/or restored.** Reconditioned carpet – sometimes referred to as “repurposed” – also may be available from independent carpet vendors.
- **Maintain carpet properly by vacuuming frequently, cleaning stains as soon as possible** according to manufacturer directions and using mats in high-traffic areas.
- **Purchase carpets that are made of recyclable fiber.**

Carpet that is in good condition can be donated to Habitat for Humanity or other organizations for reuse.

When dealing with professional carpet installers, ask in advance what they do with the carpet (and padding) that is removed from the job site. This may help you make your purchasing decision.

Another option is to include a requirement that old carpet must be recycled when submitting a requisition or Request for Proposal (RFP).

CARE for Carpet

The Carpet America Recovery Effort (CARE) is a joint industry-government effort to increase the amount of recycling and reuse of post-consumer carpet and reduce the amount of waste carpet going to landfills. The mission of CARE is to facilitate market-driven solutions to divert post-consumer carpet from landfills in order to meet the stakeholders' goals for carpet stewardship.

Since CARE's inception, carpet recovery has grown by double-digit percentages each year. In recent years CARE's members have recycled more than 500 million pounds of post-consumer carpet annually. CARE provides industry information regarding end uses for carpet, diversion and recycling rates of carpet and total tons of carpet recycled annually.

CARE's website provides information about their partner recyclers by geographic location. Please visit www.carpetrecovery.org for more information.

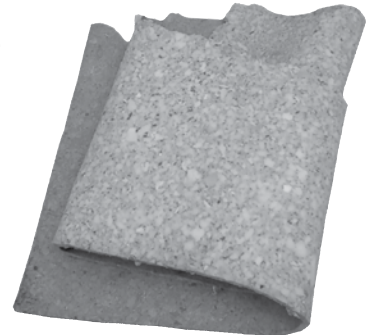


Carpet Padding

There is a fairly extensive nationwide infrastructure to recycle scrap carpet padding, most of which is foam, although some is rubber. Jute and other fibers also are used in manufacturing carpet padding, but are generally not recyclable.

Carpet padding is collected, cleaned and combined with post-industrial foam scrap and other scrap foam and remanufactured into rebond – another type of carpet padding.

Like carpet, padding is voluminous and therefore can be challenging to manage. Although it tends to be less dense than carpet, disposal of carpet padding can still be costly and may require several trips to the landfill.



Carpet and Carpet Padding Reuse & Recycling Opportunities

REUSE

- **Habitat for Humanity's ReStores** may accept the material – ReStore locator is available at www.habitat.org/restores.
- **Goodwill Industries** may accept carpet donations. An index of donation centers is available at www.goodwill.org. Call ahead to make arrangements.

RECYCLING

- **CARE – The Carpet America Recovery Effort** provides a database – searchable by state – of recyclers that accept waste carpet and padding. Visit <https://carpetrecovery.org/recovery-effort/collector-finder-map/>.

Also, check with carpet or other flooring retailers when replacing flooring to inquire about recycling opportunities through them. Remember to ask whether the padding would be recycled or sent to a waste-to-energy facility and request proof of end-of-life management of the material.

Ceiling Tiles

Ceiling tiles can be made of many different types of material – including asbestos. Asbestos ceiling tiles are not recyclable and need to be handled with special care. The S.C. Department of Health and Environmental Control's (DHEC) Bureau of Air Quality regulates the management of material containing asbestos.

Most types of ceiling tiles found in buildings today can be recycled but need to be prepared properly and meet minimum requirements for pickup.

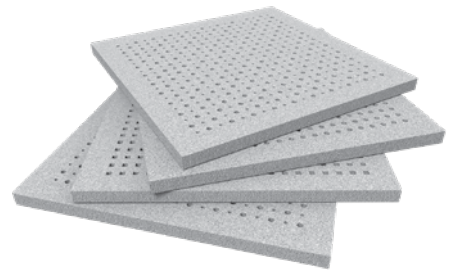


TABLE 3.1 : Types of Recyclable/Non-Recyclable Ceiling Tiles

GENERALLY RECYCLABLE	MAY BE RECYCLABLE	NOT RECYCLABLE
Dry, pulpable mineral fiber ceiling tiles or panels	Post-manufactured painted ceiling tiles	Contaminated with asbestos
Dry, fiberglass panels	Glue-up or adhesive ceiling tiles	Installed below friable asbestos
Vinyl or scrim-faced mineral fiber panels	Vinyl or scrim-faced vinyl ceiling tiles;	Red- or pink-backed
	Gypsum or ceiling board	Wet, moldy or weathered
	Fabric-faced ceiling tiles	With visible wood grain
	Cast ceiling panels	

See **National Resources for Recycling Ceiling Tiles** for ceiling tile recovery contacts.

National Resources for Recycling Ceiling Tiles

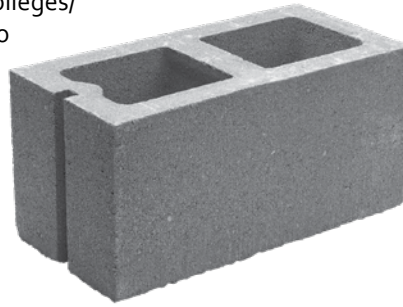
The following manufacturers of ceiling tiles offer recyclable tiles as well as programs to recover them.

- **Armstrong World Industries** provides a listing of recyclers/consolidators at www.armstrong.com/commceilingsna/article48711.html or call **1-877-276-7876** (Option 8) for help.
- **USG Corporation** provides a listing of recyclers/consolidators by state at www.usgdesignstudio.com/consolidatorNetwork.asp or call **1-800-USG-4YOU** (Option 2) for assistance.
- **CertainTeed Corporation** offers a recycling program for old ceiling tiles. Visit www.certainteed.com/resources/CTC_Recycling-Program-Eligibility-Guidelines-Procedures.pdf to learn more.

In general, in order for ceiling tiles to be accepted they must be pre-approved through a sampling process. The tile manufacturer/recycler may require an asbestos survey for buildings built prior to 1990.

College/University Policies to Encourage C&D Recycling

- **C&D Material Management Plan:** Colleges/universities may require developers to create a material management plan or a recycling plan for their projects – sometimes depending on the size or value of the project(s). This process, at the very least, makes the developer aware of what material can be recycled in the region.



Colleges/universities may require the following in their plans:

- **Where all material will be delivered and the tonnage recycled or disposed of;**
 - **Who is hauling the material from the site;** and
 - **Why material disposed of was not recycled.**
- **Other Potential Requirements:** Other policies colleges/universities have taken to encourage C&D recycling include:
 - **Requiring public projects** (or those of a certain size) **to achieve established C&D recycling goals and/or green building standards** (which include C&D recycling strategies);
 - **Requiring that certain material generated on job sites be recycled** (e.g., wooden pallets, cardboard);
 - **Requiring pre-processing of material generated** (or of projects of a certain size or dollar value); and
 - **Requiring deconstruction of demolition projects that meet certain criteria.**

Caution about C&D Debris Management

C&D debris that has come in contact with or includes petroleum products, PCBs, solvents, pesticides, herbicides or preservatives is NOT acceptable for disposal in C&D landfills.

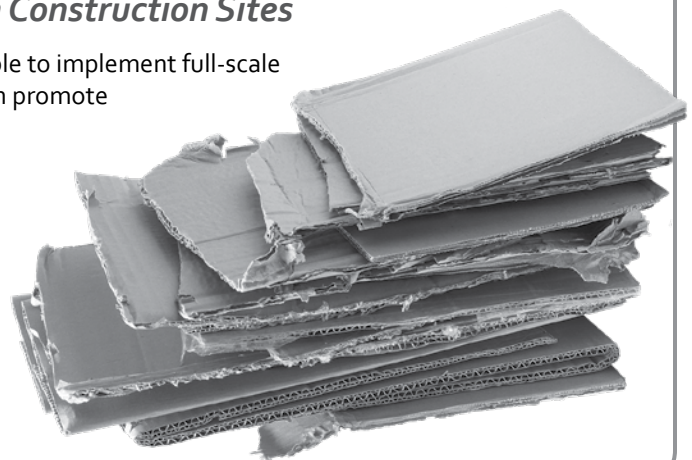
Open dumping of C&D debris at a construction site or any other site is not permitted by DHEC. Open burning of waste from C&D activity is prohibited from all commercial sites.



Call to Action: Recycling Cardboard from Construction Sites

In cases where college/university resources are not available to implement full-scale C&D debris recycling programs, recycling coordinators can promote cardboard recycling at construction sites. Many products come in cardboard boxes, including light fixtures, cabinets, appliances and flooring.

Recycling coordinators can help builders place appropriate size containers for cardboard collection, train their staff to source separate material and arrange to have the material collected or collect it themselves. Even campuses without a recovery facility usually have markets for cardboard. Any revenue generated could be used to offset the cost of collection.



Green Building Requirements

The U.S. Green Building Council has developed the Leadership in Energy and Environmental Design (LEED) program, which has become a popular standard for incorporating sustainable practices in construction and deconstruction projects.



LEED now has five rating systems:

- **Building Design and Construction (BD+C);**
- **Interior Design and Construction (ID+C);**
- **Homes Design and Construction (HD+C);**
- **Building Operations and Maintenance (O+M);** and
- **Neighborhood Development (ND).**

LEED is a point-based certification program that quantifies how well buildings perform at saving energy, reducing carbon dioxide emissions, reducing water use, fostering a clean environment, encouraging the use of alternative transportation and more. The highest ranking is platinum, followed by gold, silver, then LEED-certified.

S.C. Green Building Requirements for Large Construction Projects

Due to the 2010 Energy Standard Act, all state-owned and state-funded construction projects greater than 10,000 square feet and any major renovation projects of greater than 50 percent of total building space or value must achieve at least LEED Silver certification, Green Globes two-globes standard or comparable standard.

Several private and municipal buildings in South Carolina have attained LEED certification.

Another program called Green Globes encourages green design and maintenance. Green Globes has certification programs for new buildings or significant renovations of existing buildings (Green Globes for New Construction – or NC), as well as for operations and maintenance of existing buildings (Continuous Improvement of Existing Buildings – or CIEB) and for interior design (Sustainable Interiors – or SI).

References & Resources for Chapter 8

- Building Materials Reuse Association, bmra.org
- CalRecycle Model C&D Ordinance and Information, www.calrecycle.ca.gov/lgcentral/library/canddmodel/instruction/faq
- Carpet America Recovery Effort (CARE), carpetrecovery.org
- Construction & Demolition Recycling Association (CDRA), www.cdrecycling.org
- DHEC, Bureau of Air Quality, Asbestos Information, www.scdhec.gov/HomeAndEnvironment/YourHomeEnvironmentalSafetyConcerns/AsbestosInfoforHomeowners/
- Green Resource Index, www.scdhec.gov/sites/default/files/Library/OR-1715.pdf
- GreenBuilding.com, www.greenbuilding.com
- Habitat for Humanity ReStores, www.habitat.org/restores
- Orange County, North Carolina C&D Information (Example of a county C&D Recycling Ordinance), www.co.orange.nc.us/933/Construction-Demolition
- S.C. Energy Standard Act, www.usgbc.org/usgbc-south-carolina
- S.C. Green Building Directory, www.scgreenbuildingdirectory.org
- S.C. Solid Waste Policy and Management Act of 1991, www.scstatehouse.gov/code/t44c096.php
- The Sustainability Institute (South Carolina), sustainabilityinstitutesc.org
- U.S. Green Building Council, LEED, new.usgbc.org/leed
- U.S. Green Building Council, South Carolina Chapter, www.usgbc.org/usgbc-south-carolina

Greening Collegiate Sports

CHAPTER 9

Why focus on greening collegiate sports?

Athletics are often the center of collegiate life. They draw crowds and bring together students, alumni and the public, providing an opportunity to showcase the college's/university's image. Green initiatives at sports venues help support sustainability plans, promote environmental awareness to a broader audience and reach student athletes and attendees directly.

Establishing Support and Partnerships

Collegiate athletics programs involve many different entities. To set up a successful green sports initiative, it is important to establish collaboration with everyone involved.

SEEK SUPPORT FROM THE TOP

High-level administrators and athletic staff are key to greening sports. Meet with administrators to obtain support and present:

- **Benefits of greening sports;**
- **Examples of other colleges/universities that have implemented similar programs, especially any rivals;**

- **Specific steps to implement and the proposed timeframe;**
- **Any cost savings that might be incurred; and**
- **How the program supports existing sustainability plans adopted by the college/university.**

OBTAIN INPUT FROM THOSE IN THE KNOW

Different departments and service providers have knowledge about athletics operations.

Examples of staff and contractors to consult when developing a plan to green sports include:

- **Athletics department;**
- **Sports marketing department or the vendor that manages sports venue(s);**
- **Sports venue concessionaire(s);**
- **Waste/recycling hauler or department;**
- **College sustainability office;**
- **Facilities management department; and**
- **Contract management/procurement department.**



USE STUDENT STAFF AND/OR VOLUNTEERS

Most collegiate recycling programs depend on student staff and/or volunteers. Recruit volunteers from large groups on campus that might be interested in volunteering, such as:

- **Fraternities and sororities;**
- **Clubs**, especially green or sustainability-focused groups;
- **Faculty/staff members;** or
- **Other athletic teams from the college.**

Volunteers' roles will vary depending on the program and the responsibilities of contracted service providers. Volunteer roles might be to:

The Volunteer Station

A volunteer station is where students can sign in, verify where they are needed and ask questions. A volunteer organizer, staff person or experienced student volunteer should be present at the volunteer table at all times.

Items to keep on hand at the station include:

- **Volunteer T-shirts;**
- **Bags for recyclables;**
- **Volunteer sign-in sheets and contact information;**
- **Gloves;**
- **Hand sanitizer;**
- **Flashlights;**
- **Rain ponchos;**
- **Sunscreen;**
- **Buckets** to collect liquids;
- **Attendee handouts** (e.g., merchandise/giveaways, recycling information, sponsor-provided promotional material);
- **Scissors, tape and string** as needed to hang signs;
- **Instruction sheets;** and
- **Water and snacks.**

- **Set up recycling areas in tailgate sections prior to the game** and collect recyclables from areas after the game starts and tailgating ends.
- **Walk through tailgate areas to remind attendees to recycle.** Inform them of what is recyclable, and hand out bags as needed. Consider having recycling bag dispensers in the tailgating area for low-volunteer days.
- **Instruct attendees where to deposit bags.**
- **Stand near entrances to the stadium to collect last-minute bottles, cans and cups before the game begins.** Be sure to have buckets for emptying liquids.
- **Deliver bags of recyclable material to central collection points and deposit them into containers.** This provides an opportunity for quality control.
- **Visit suite areas of the stadium to inform attendees about the recycling program and empty bins.**
- **Stand near recycling/compost containers in concourse areas of the stadium to ensure attendees are participating properly.**
- **Sort through material at the end of the game/event.**

In order to retain student employees and volunteers and ensure their contribution is a success, consider the following suggestions.

- **Correspond with student employees and volunteers prior to the event.** Remind them of their roles and ensure any questions are answered. A reminder should be sent out two days before the event.
- **Have student employees and volunteers wear matching gear** and ask them to bring their enthusiastic recycling spirits.
- **Have volunteers serve two- to three-hour shifts** so they can also enjoy the event.
- **Plan to have the largest group of volunteers at the end of the event to help with stadium cleanup and/or sorting.**
- **Have volunteers work in pairs to prevent boredom.**
- **If possible, provide volunteers with perks** (e.g., T-shirts, event tickets, food tickets, reusable water bottles/coffee mugs).
- **Identify roles for students who are in environmental classes or students with related thesis projects.** These roles can be long term and/or leadership positions.
- **Encourage student volunteers to take photos of recycling at the event and pass them on to the team for the college's/university's social media accounts.**

(All posts should be at the discretion of a trusted staff member to ensure they follow the college's/ university's media guidelines.)

- **Consider a contest among volunteers to generate enthusiasm** (e.g., a photo contest, a contest to obtain the most signed pledges to recycle, a contest to collect the most bags of recyclables).
- **Identify student staff/volunteers' strengths and assign tasks accordingly** (e.g., outgoing people can hand out bags and tell attendees about the program, people who don't mind getting dirty can sort waste).

Corporate Sponsorships

Corporate sponsors can provide financial support in establishing a green sports program. Plan on approaching corporate sponsors a year in advance with specific requirements.

Consider offering several levels of sponsorship with appropriate benefits associated with each. If concessions vendors are asked to purchase certain products (e.g., snacks with recyclable packaging, compostable cups), provide them with sponsorship benefits and give them credit in reporting program successes.

Sponsorship benefits may include recognition in press releases or during game broadcasts, free game tickets, advertising on the college's/university's website or the opportunity to market products at events. A "green minute" played on the stadium screens during the game can include a fun public service announcement involving athletes, coaches and sponsors.

Potential corporate sponsors include vendors (e.g., food, beverage, recycling, waste collection) and local businesses.

Preparing for Game Day

Preparation is key for a successful game day. Some tasks to complete in advance are listed below.

- **Remind volunteers of their roles, where to meet and what to wear.** Reminders can be sent via email and/or text.
- **Have plenty of supplies ready for your team.** See information about volunteer stations on the previous page.
- **Wear appropriate attire for collection.** Gloves, closed-toe shoes and matching shirts not only encourage safety, but unify the team. Should there be

a chance of rain, make sure staff and volunteers are informed. Provide ponchos.

- **Have bins, roll carts and all other collection devices ready to go early on game day.**
- **Permanent bins that receive high traffic should be emptied in the days leading up to the game.**
- **Share contact information.** Everyone on the team should know how to communicate with each other.

Recycling in the Stadium

Stadiums have more controlled waste streams, particularly if the public is not allowed to bring their own food and beverages inside. There are still locations within the stadium where different types of material are generated.



Steps to plan a recycling/composting program within the stadium include:

1. Identify material to be collected/recovered and how it must be prepared.

- What material can be included in the recycling program?
- If a material can't be recycled, can it be replaced with a recyclable option?
- What can be included in organics collection?
- What level of contamination is acceptable?

2. Identify container types, locations and how material will be collected during and after the event.

- Ensure that recycling/composting is at least as convenient as disposal. At a minimum, twin every bin.
- The stadium management company can provide information regarding number/types of containers and their locations.
- Smaller containers will likely need to be emptied throughout the event into larger containers. Using bags is convenient because the container does not need to be removed from the location. Alternatively, spare carts can be on hand to replace full carts that are being tipped.
- Limited areas (e.g., premium suites, box seating, bar areas) often offer beverages poured from glass containers into plastic cups. These areas

require small containers primarily for glass that need to be emptied frequently.

- Inform vendors where to set out cardboard for recycling, whether in a dumpster outside or inside the building for collection by staff.

3. Identify responsibilities.

- Volunteers can "sweep" the stadium at the end of the event to collect additional cups, bottles and cans for recycling.
- Clearly identify who should tip into larger containers. This may be the responsibility of the recycling team, the custodial staff or the stadium management company, depending on contracts.

Recycling in Tailgate Areas

The variety of food/beverage containers and service ware found in tailgate areas can make the development of collection systems challenging. Despite this, implementing recycling/composting programs in tailgate areas is an important way to highlight a college's/university's commitment to waste minimization. Steps to plan a tailgate recycling/composting program include:

1. Identify material to be collected/recovered.

- What material can be included in the recycling program?
- What can be included in organics collection?
- What level of contamination is acceptable?

Inspired by Competition

The Game Day Recycling Challenge is a competition among colleges/universities that encourages increased recycling at football games. Colleges/universities report data including tonnage of material recycled, reused, donated or composted, as well as tonnage of trash disposed and game attendance.

The National Competition categories are for diversion rate and total recycling. Conference-Level Competition includes the following categories: recycling (tonnages), waste minimization, greenhouse gas reduction, organics recovery and diversion rate.

For more information visit www.gamedaychallenge.org.



2. **Coordinate with recycling/solid waste/compost service providers to understand how to prepare material** (e.g., Can recyclables/food waste be bagged? If so, is there a specific type of bag that has to be used in each case?).
3. **Plan the number/types of collection containers and where they will be located.** Remember:
 - Sites should be visible and conveniently located.

Steps to Adding Composting to Your Green Sports Program

1. **Identify whether your current hauler will collect organics or if a separate hauler will be necessary.**
2. **Conduct a waste audit to identify the quantity of compostable waste generated at a representative event.**
3. **Assess existing waste/material collection infrastructure.**
4. **Identify container and signage needs.**
Co-locate compost receptacles with trash and recycling receptacles.
5. **Negotiate an organics hauling contract with your chosen hauler.** (This may involve issuing an RFB/RFP). Plan a composting budget.
6. **Incorporate compostable service ware requirements into concessionaire contracts.**
Work with compost processor to test compostability of service ware products.
7. **Train concessionaires, staff (including back-of-house) and volunteers on compost procedures.** Be receptive to their suggestions and input. In some cases organics processors or haulers will want to be involved with or provide this training.
8. **Seek corporate sponsors for the program** (e.g., concessions vendors, food suppliers, manufacturers).
9. **Educate and involve fans in the program.**
10. **Track progress and identify opportunities for improvement.**

SOURCE: Adapted from www.nrdc.org/greenbusiness/guides/sports/files/sports-venue-composting-guide.pdf

- Recycling and/or composting should be at least as convenient as disposal.
- Containers should be color-coded, clearly labeled and include the college/university sustainability logo.
- Place containers near stadium entrances for outside beverage containers.
- Consider offering only two bins: one for recycling and one for compost. It may be more efficient to have your team pull trash out of the recyclables rather than pulling recyclables out of the trash.

4. Identify the method for collecting recyclables and depositing them into the central containers.

- Will volunteers collect recyclables from attendees throughout the tailgating area? Will bags be given to attendees as they enter the tailgating area, or will volunteers distribute them throughout the tailgate?
- Will vehicles (e.g., golf carts, trucks) be utilized by staff/volunteers to collect material?
- Will attendees deposit material in the containers themselves? If so, will staff/volunteers be stationed at containers to take recyclables/food scraps from attendees?

Monitoring Progress

Recycling, trash and compost service providers should provide quantity data for each event.

Other data that should be tracked includes:

- **Contamination rate** (or feedback about opportunities for improvement).
- **Number and types of containers and their adequacy.**
- **Number of game attendees.**
- **Cost of service.**
- **Date when changes in the program occurred** (e.g., new recyclable material added, additional locations covered) in order to explain changes in data.

Typically, colleges/universities estimate a recycling rate for each game, tons recycled for each game and metrics such as pounds recycled/disposed per attendee.

Encouraging Participation

Setting up clear guidelines and reminders are the foundation to getting fans to participate in recycling efforts. Include information about recycling/green sports programs with tickets to set expectations. Provide reminders that keeping the grounds clean and recycling/composting show pride in the college/university. Announcements thanking participants and updating them on statistics or progress can be made before and during the game. Consider donating a portion of proceeds from the recycling program to charity – this motivates students and other fans.

No matter the marketing techniques employed, be sure that containers are conveniently located and easy to identify with clear, color-coded labels. Be consistent so regular attendees know what to expect.

Challenges/Difficulties

Some challenges you might face when setting up a green athletic event include:

- **Sports venues often employ short-term or temporary workers.** Weekly operations can become challenging, as employees will likely need to be trained before each event.
- **It may be difficult to harmonize efforts among the many departments that coordinate sporting events.**
- **Some event attendees are simply not motivated to participate.**
- **Identifying compostable/recyclable items (e.g., plates, cutlery, cups) can be a challenge.**
- **Athletics department staff are already coordinating and managing events.** Sustainability requires additional efforts that may be difficult to maintain.

Ways to Grow the Program

Starting a program to “green” athletic venues can be intimidating, but most programs do not expect zero waste status on day one. Good places to start greening programs include:

- **With a single game or series of games like Game Day Challenge, America Recycles Day or RecycleMania;**
- **Specializing in greening one sport,** then expanding to other sports venues;
- **Beginning with recycling traditional commodities**

(e.g., plastic bottles, aluminum cans) and expanding with success; and

- **Beginning the recycling program inside the stadium,** then adding tailgate recycling outside of the stadium.

Purchasing & Contract Considerations

Collegiate sports facilities often have numerous vendors for the range of services their operations require. When developing green sports initiatives, be sure to incorporate vendor requirements in any requests for bids and final contracts. Monitor these policies throughout the contract terms for compliance.

PURCHASING

- **Require vendor use of reusable transport packaging.**
- **Purchase low- or non-toxic products,** including grounds keeping supplies, janitorial products and pool maintenance goods.
- **Purchase recyclable products and/or products made with post-consumer recycled content** (e.g., printer paper, sanitary paper, paper towels).

Testing Tailgate Recycling

Keep America Beautiful encourages colleges to commit to recycling at one game in October or November to celebrate America Recycles Day (November 15). A limited number of colleges that register receive a free Tailgating Recycling Events Toolkit. The kit may include a banner, recycling bags, buttons and/or T-shirts. Additional downloadable advertising and outreach material are available after registration, including:

- **Customizable print ad template;**
- **E-newsletter/website ad;**
- **Facebook icon;**
- **Pledge cards;**
- **Posters (11x17);**
- **Radio PSA script; and**
- **Sample news release, volunteer memo and volunteer schedule.**

Please visit <https://americarecyclesday.org/toolkits/college-and-university-tailgating-tools/> for more information.

FOOD VENDOR

- Include acceptable food scraps in the composting program.
- Sell packaged foods with compostable/recyclable packaging.
- Require recycling of cardboard/packaging as well as used cooking oil.

- Require use of reusable transport packaging.
- Require donation of unserved food to local shelters or charities.

LANDSCAPING SERVICE PROVIDER

- Use native plants.
- Use xeriscape landscaping techniques (techniques that require little or no irrigation).

Game Day Play-By-Play

At Coastal Carolina University (CCU), recycling is part of everyday culture. Providing recycling opportunities during athletic games is no exception. CCU takes pride in offering convenient and consistent recycling options for almost 10,000 students, staff, faculty and visitors during home football games. Below are some details about how the program is carried out.

WHO COLLECTS RECYCLABLE MATERIAL?

- **Waste Reduction Coordinator:** A full-time position.
- **Green Team and Eco-Reps:** Paid student workers from the Sustainability Department; six Green Team Members and four Eco-Rep Leaders.
- **Volunteers:** Recruited from different groups across campus; between 10-40 at each game.

HOW IS MATERIAL COLLECTED?

- **Vehicles:** Two pickup trucks and two golf carts with a pull-behind trailer.
- **Recycling Containers and Supplies:**
 - 30-yard roll-off container for commingled recyclables
 - ClearStream blue racks - Used at student tailgates
 - 65-gallon roll carts - Used at alumni tailgate and stadium gates
 - 10-gallon indoor bins - Used for bars in the suites
 - 25-gallon indoor bins - Used in the suites
 - Can liners and blue tailgate recycling bags
 - Gloves, hand sanitizer, flashlights, buckets and fanny packs for supplies

Word of mouth is key for encouraging fans to participate in game day recycling. CCU's Sustainability Coordinator uses social media (Instagram and Twitter) during the game to remind attendees to recycle.

Eco-Reps provide tailgaters with bags and inform them of what can be recycled. They direct fans to place full bags by their vehicles when they go into the game. Eco-Reps and Green Team members collect the material. Student volunteers help after the game, sweeping the stadium for recyclable material, placing it in plastic bags then emptying them into the recycling roll-off container.

Most bins and carts are lined with plastic bags. Bags are emptied into the roll-off container. If possible, liners are reused. The roll-off container is provided by the Horry County Solid Waste Authority, who empties the container before and after home games.

During the 2014 season, over six home games, the average quantity recycled was .76 of a ton per game, with an average diversion rate of 44.3 percent. On November 14, 2015 CCU attempted their first Zero Waste football game. They collected recycling, compost and waste from the alumni tailgate, stadium suites and the stadium stands after the game.

The final score: 1,170 pounds of waste were recycled, 2,250 pounds were composted and 700 pounds of waste went to the landfill, which made the total diversion rate 83 percent. This success resulted in CCU coming in 7th place for the 2015 Game Day Recycling Challenge National Diversion Rate Competition.



TRANSPORTATION VENDOR

- Use a bus company with biodiesel buses for sports team transportation.

JANITORIAL VENDOR

- Integrate sorting of recyclables from trash as a part of responsibilities.
- Ensure that transporting of compost or material de-bagging is included in the service contract.

RECYCLING/WASTE HAULER

- Ensure that providing containers/collection of material at sports events is included in the contract.

- Include provision of data about the quantity of material collected (by material type) for each event in the contract.
- Allow flexibility in the contract, including the option to add material as the program expands.

Broad Environmental Initiatives

Collegiate implementation of waste reduction and recycling at sporting events often leads to improvement in more broad environmental initiatives (e.g., litter reduction, the Zero-Waste Movement, climate change/carbon neutrality action plans, Green Building/LEED Certifications of buildings, the overall sustainability movement).

Tips for Establishing an Environmentally-Friendly Sports Venue

- **Establish a sustainability committee of interested staff and students.** Include members of the athletics, recreation and campus sustainability departments.
- **Engage leadership from senior administration, including athletics, recreation and sustainability departments as early as possible.**
- **Partner with departments across campus, vendors and community experts.**
- **Consider goals when drafting new vendor agreements.**
- **Identify campus-wide sustainability goals, standards and ongoing programs.** Evaluate opportunities to collaborate and build on existing greening initiatives.
- **Identify opportunities to acquire local, state and federal grants.**
- **Identify potential sponsors, including vendors and alumni.**
- **Set regular meetings for interested parties.** Publicize meetings to student groups and staff.
- **Conduct an audit to track waste generation and use of energy, water and paper across all sports facilities.**
- **Write a sports greening mission statement and set goals.**
- **Create a list of greening ideas.** Prioritize initiatives based on return-on-investment, ecological urgency, feasibility, sponsor support and student/fan interest.
- **Start with the “low-hanging fruit” and build on successes.**
- **Incorporate humor in education and outreach efforts to sports fans.**
- **Establish a tracking system for measuring savings, progress and setbacks.**
- **Translate successes into easily understandable outreach for stakeholders.**



SOURCE: www.nrdc.org/greenbusiness/guides/sports/files/collegiate-game-changers-report.pdf

Some environmentally beneficial practices implemented in athletics venues, include:

- **Achieving Green Building standards in design, construction or operation;**
- **Minimizing the usage of water at sporting venues and practice facilities;**
- **Establishing renewable energy and energy-efficient measures;**

- **Promoting the use of less toxic products;** and
- **Promoting the use of alternative transportation and/or energy-efficient transportation.**

In many cases green strategies implemented reduce operating costs, as they reduce the consumption of water and energy. Other benefits include improved air quality, increased education about environmental issues and a stronger sense of community.

Source Reduction Strategies

Athletic departments and venues are cutting waste generation through source reduction in the following ways.

- **Installing water bottle refill stations.**
- **Investing in reusable athletic items.**
- **Encouraging less reliance on printed material** among staff and athletes through alternatives and reducing the number of desk-side printers/copiers in athletics offices.
- **Reusing or donating used sports gear.**
- **Donating unused food and encouraging trayless dining** at athletic dining events and facilities.
- **Encouraging the use of reusable packaging among vendors.**
- **Using smart phone scan technology** to reduce the need for printed material at athletic events.
- **Using software to minimize paper for athletic facility membership.**
- **Using hand dryers in rest rooms** to avoid the generation of paper towels or purchasing unbleached, recycled-content paper towels and composting them after use.

For more details regarding greening athletic facilities see the Natural Resource Defense Council's Greening Advisor for Collegiate Athletics and Recreation at <http://collegiate.greensports.org/>.

References & Resources for Chapter 9

- Coastal Carolina University's Sustainability Department
- Game Day Challenge, <http://gamedaychallenge.org/>
- Green Sports Alliance, <http://summit.greensportsalliance.org/>
- Keep America Beautiful, "Go To Guide: Tailgating Recycling Events," <http://americarecyclesday.org/wp-content/uploads/2012/06/Tailgating-Go-to-Guide-20132.pdf>
- NIRSA: Leaders in College Recreation – Sustainability, <http://nirsa.net/nirsa/sustainability/>
- Natural Resource Defense Council (NRDC), Green Sports Guide, www.nrdc.org/greenbusiness/guides/sports/files/collegiate-game-changers-report.pdf
- NRDC, Greening Advisor, <http://collegiate.greensports.org/>
- NRDC, Guide to Composting at Sports Venues, www.nrdc.org/greenbusiness/guides/sports/files/sports-venue-composting-guide.pdf
- RecycleMania, www.recyclemania.org
- Virginia Tech, "Greening Your Game Day: The Collegiate Football Sustainable Materials Management Kit," Version 1.0., http://curc3r.org/wp-content/uploads/2014/10/collegiate_football_smm_guide_final.pdf

Effective Contracting & Marketing

CHAPTER 10

What is effective contracting?

Effective contracting is using a competitive process for a good or service, which ensures that the needs of the college/university and the service provider(s) involved are met. This occurs through a contractual arrangement with a qualified service provider at a cost-competitive rate through a mutually beneficial agreement. In most cases the competitive process is initiated by the college/university by issuing a Request for Proposal (RFP). The RFP – an invitation for potential suppliers to submit proposals offering a specific product or service – must be carefully developed to secure the desired product or service.

Seven Steps to Effective Contracting

The following steps will help to ensure an effective procurement and contracting process.

- 1. Precisely define services to be contracted.**
The complete geographic area, population, number of points of generation and number of points of collection must be defined for potential service providers. The complete range of services desired – the nature and type (e.g. collection, processing, transportation, marketing of material, communication, education, program administration, operation) – also must be specified in a clear manner. The duration of the contract should be designed to reflect both the needs of the college/university and the realistic capabilities of the potential bidders. For contracts involving the purchase of equipment, contracts should match the life cycle of the equipment being purchased. If the contract is too short, the contractor must capitalize the equipment over the period of the contract resulting in sub-optimal pricing and cost. If the contract exceeds the equipment lifespan by a year or more, the contractor will incur expensive extended maintenance or costly new equipment that must be built in to the price. Current life-cycle expectations for new collection trucks are about seven years and new material recovery facility (MRF) equipment is 10 to 15 years.
- 2. Determine contractor pool and market position.**
The college/university must determine whether their location is large enough that it has bargaining power. Good results are more likely to come from a minimum of three to five bidders. In some areas, bargaining

power may be improved by bundling services or partnering with other colleges/universities or public entities to increase the attractiveness of potential business. With respect to recycling collection and processing, the leading practice is to structure the procurement process to allow for separate contracting for these services. With this approach, it is best to focus on processing before collection or to specify a MRF location so potential collection service providers will know the location of the MRF and can structure their proposals/bids accordingly. Obtaining separate prices for collection and processing, even if under one contract, is preferred. Also, if additional material is to be added during the course of the contract, address whether/how that will affect cost in the RFP/contract.

- 3. Prepare a detailed, unambiguous RFP or Request for Bids (RFB) or Quotes (RFQ).** The college/university will have to decide whether the services requested warrant an RFP, RFB or RFQ. An RFQ is essentially the same as an RFB. RFBs and RFQs work best when services are already defined, all bidders are qualified and price is the sole deciding factor.
- 4. Employ a fair and transparent contractor selection process.** To make sure all potentially qualified companies have the opportunity to respond, and to

Establishing Terms That Are Mutually Beneficial

A contract should result in the college/university entering into an agreement with a qualified hauler that provides specified services at a price that represents a good value relative to that offered by competitors. There may be some trade offs with quality. Ideally, contract specifications will:

- **Clearly define acceptable levels of service;**
- **Encourage the MRF and/or hauler to maximize revenue from the sale of recyclables;**
- **Encourage higher material recovery rates;**
- **Yield material of high, marketable quality; and**
- **Enhance working relationships with service providers.**

avoid challenges to the RFP, the college/university must use a fair, transparent and defensible contractor selection process. Follow procurement guidelines, but try to elicit interest from as many potential service providers as possible. In order to learn about the capabilities and interests of potential contractors in advance, consider prequalifying bidders through either an RFQ in advance of the RFP or through a pre-proposal/bid meeting with potential contractors. During proposal and bid development, have a clear and easy process for potential contractors to ask questions and access answers. Lastly, clearly describe the evaluation criteria to ensure that contractors who are not qualified don't spend time developing a proposal and that bidders who respond to the RFP provide all requested information. Always require and verify references.

5. **Negotiate a partnership-oriented contract. In developing the contract, build upon the terms and conditions specified in the RFB/RFP.** Incorporate

Procurement & Contracting Goals

The goals of procurement and contracting are to:

- **Secure the desired service from competent private-sector contractors at the lowest possible cost; and**
- **Create an effective working partnership between contracting entities.**

The U.S. Environmental Protection Agency (EPA) has coined the term "resource management," which compensates haulers based on their ability to help the community achieve their material management goals. Resource Management essentially aligns waste contractor incentives with the campus' goals to encourage innovative approaches that foster cost-effective resource efficiency through prevention, recycling and recovery. For example, the contract should provide a financial incentive for raising recycling rates over a specified level.

For bundled service in which the hauler provides the garbage and recycling collection, it is important to set a service fee that allows the hauler to cover their collection costs. If the quantity of garbage collected decreases as a result of increased diversion, the hauler should not be penalized.

Visit www.epa.gov/smm for more on Sustainable Materials Management.

incentives for improving performance on the part of the contractor. Allow flexibility for amending the scope of work to address changing circumstances including unexpected events such as adding new commodities to the program.

6. **Consider opportunities to build risk-sharing into the contract.** For example, consider index-based monthly fuel adjustments and/or index-based annual payment escalation to accommodate future price fluctuations in an equitable manner. By doing so, the bidder will not have to inflate the cost of the proposal to cover a potentially risky cost scenario.
7. **Manage compliance yet maintain a partnership approach in contract administration and monitoring through the entire contract term.** It is important to assess contract compliance, but approach issues that might arise immediately and in a spirit of wanting to resolve them in a productive manner. Monitoring compliance on a continuous basis can prevent small issues from escalating. The contract manager also should identify ways in which the contract terms may need to be adjusted in the future.

Material Recovery & Markets

The marketing of recovered material is one of the most critical factors in the success of any recycling program. The cost to bring a material to market and the revenue realized from the sale of material directly affect the net cost of the entire recycling system even in programs where the marketing is done through a contract and the recycling coordinator may not directly participate. The available markets for a material and potential market revenue are important criteria that recycling coordinators should use to target material for recycling.

Generally, a recycling coordinator's goals related to material marketing are to:

- **Direct recovered material into value-added end uses;**
- **Mitigate risk by maximizing and sharing in the revenue received for marketed material;**
- **Understand emerging trends and issues in the recovered material marketplace and interpret their effect on the program;**
- **Evaluate the ability of the marketplace to absorb additional types and/or quantities of material being considered for recovery; and**
- **Increase quality and quantity of recovered material, as possible.**

Attracting Potential Bidders

The result of an effective procurement process is competition among several potential bidders for the contract or franchise. If only one or two companies bid, it may be necessary to re-examine the RFP to discover why more bidders did not respond. Examples are provided below.

- **Are the services being solicited difficult or overly onerous for service providers to perform (e.g., impassable roads, difficult-to-access sites)?** Insisting that haulers provide services that are difficult to perform or that could jeopardize their equipment will result in fewer bids and/or more costly bids. It can be helpful to speak with haulers about agreeable compromises before the RFP/RFB is developed. Some colleges/universities have worked with haulers to make concessions for such conditions. Also, ensure that data being requested is actually possible to obtain, allow some flexibility in how it is provided and be sure data requested will be used.
- **Are equipment specifications overly burdensome (e.g., a dedicated fleet or expensive equipment)?** If you know the equipment used by haulers

Components of a Good RFP & Contract

Below are some components of a well-thought-out contract. Some specifications apply only to collection or MRF operations.

- **Clearly defined terms**
- **Service(s) to be provided**
 - Services (e.g., recyclables, yard trimming, garbage)
 - Same-day service
- **Days of collection, start/end times**
- **Holidays**
- **Manner of collection**
 - Obey traffic laws
 - Provide maps/routes – written permission to change
 - No littering
 - Restrictions on weight, size, etc.
 - Return bins/carts
 - Keep material streams separate
- **Facility or MRF where material is to be delivered** (and how payment is made for delivery – e.g., who pays processing fee, is it included in bid price?)
- **Adequate background information and data**
- **Clear expectations regarding qualifications and experience**
- **Detailed performance specifications addressing the following factors**
 - Location (for MRF) and collection areas
 - Regulatory compliance
 - Recyclables accepted (initial and provisions for the future)
 - Markets for processed material (for MRF)
 - Capacity (for MRF)
 - Vehicle access, operating hours, weighing, recordkeeping and reporting (for MRF)
 - Residue management and limits (for MRF)
 - Start-up schedule/contract start date
 - Handling of complaints (how information is conveyed between parties)
 - Billing responsibilities
 - Communication systems
 - Recordkeeping and reporting requirements (for college/university)
 - Training and public education (if included)
- **Vehicle requirements**
 - Type of collection
 - Number of spare vehicles
- **Container requirements**
 - Ownership
 - Replacement
 - Sizes/options for replacement
 - Who distributes initially
 - Who is responsible for maintenance/repairs
 - Cleaning/painting requirements – if dumpsters, compactor service is included
- **Public education requirements** (e.g., distribution of literature, tags for improper setouts, signs on vehicle, rebate to the college/university to cover the cost of education)
- **Personnel requirements**
 - Training
 - Uniform with company name
 - Valid license
 - Level of supervision
 - Regular safety training
 - Staffing level (e.g., per vehicle)
- **Ownership of recyclables**
- **Incentives for increasing performance** (e.g., resource management contract)
- **Penalties for poor performance/liquidated damages**
- **Contingencies for natural/man-made disasters**
- **Opportunities for amending scope to address changing circumstances** (e.g., good faith negotiations, future plans)
- **Performance security** (e.g., security bond, letter of credit requirements)
- **Avenues for resolving disagreements** (e.g., mandatory third-party mediation clause)
- **Points of contact**
- **Clear financial/cost proposal instructions**
- **Price escalators/adjustments** (e.g., when assessed, what it is based on – Consumer Price Index, fuel index)
- **Default/termination** (clearly define process)
- **Replacement of defaulted contractor** (e.g., performance bond, others have right of first refusal)
- **Terms of agreement** (e.g., five years with optional one-year renewals)
- **Insurance requirements** (e.g., liability, worker's compensation)
- **Change of law, amendments and waivers**
- **Assignment** (vendor is still responsible, college/university must approve subcontractors)
- **Description of selection process**

before issuing an RFP/RFB, you can have a better understanding of what is realistic. It may be beneficial to identify a level of service desired without specifying the type of equipment to be used or issue the RFP requesting pricing options with current technology and using a new, different technology. Hauler interviews can elicit additional information regarding barriers to using new collection equipment/ technologies and may result in some win-win compromises.

- **Can the volume of business be expanded through bundling of services, thereby making the contract more attractive?** Smaller colleges/universities in particular may not have much leverage in the marketplace to attract service providers, especially if they do not operate in the geographic region. Alternatively, can contracting opportunities be apportioned to provide means by which small as well as large service providers can bid on services to be provided and/or more than one contractor can be engaged to provide service? Economies of scale are gained by having one hauler service a specified area, however, the downside is that other haulers lose business and long-term competition may suffer.
- **Is too much risk being placed on the service provider?** Sharing risk can result in less costly fees as the processor or hauler does not have to “plan for the worst” possible commodity pricing outcome, for example, if some price-driven flexibility is built into the contract. Another example is to include fuel price escalators in the contract so that increases in the price of fuel are not strictly borne by the hauler.

Got markets?

Many different markets and marketing arrangements are available depending on the priorities of the college/ university, local resources and actual or perceived barriers to certain market options. It is beneficial for recycling coordinators to be familiar with the final markets available for collected material.



In order to identify markets for recovered material, recycling coordinators can:

- **Check with other colleges/universities nearby to see which markets they use;**
- **Survey local MRFs and waste haulers to determine which recovered material they accept; and**
- **Check the market resources available from both the S.C. Department of Health and Environmental Control’s (DHEC) Office of Solid Waste Reduction and Recycling (Office) and the S.C. Department of Commerce’s Recycling Market Development Program.** (See the References & Resources section of this chapter for links.)

The different types of potential end markets for recovered material from college/university programs are discussed beginning on the following page.

Private Haulers

Colleges/universities may contract with a private hauler to collect recyclables and deliver the collected material to a MRF or other processor. It is then processed to meet market specifications and sold to end users that use the material as feedstock in the manufacturing of new products.

While the ownership of the material typically passes to the hauler, it is still in the campus’ best interest to ensure that the material is being marketed and sold. Some hauling companies also own MRFs, while others rely on MRFs owned by a separate company to process the collected recyclables.

Private MRFs

Several companies in North America specialize in providing recycling processing services under contract, but do not provide hauling services. Typically, a private processor will establish a MRF by contracting with one or more local governments to accept recyclables that are under their control, whether collected by local government crews or private haulers. Having a commitment for a certain amount of material helps the company secure funding to

Definitions

MRF refers to a **MATERIAL RECOVERY FACILITY** or a facility where mixed recyclables are sorted and prepared for market. Typically MRFs use a combination of manual and mechanical sorting, and bale material so that greater quantities can fit on a truckload. This is a common industry term, but is not a legal definition.

In the S.C. Solid Waste Policy and Management Act of 1991 (Act), MRFs are referred to as "RMPFs" which stands for **RECOVERED MATERIAL PROCESSING FACILITY**.

construct the MRF. The capital to develop the MRF can be provided by a private operator or a local government(s). Strong markets like colleges/universities are essential to the success of private MRFs.

A processing fee may be charged to cover some costs of operating the MRF and/or the processor may cover costs, in part or in whole, with revenue from the sale of recyclables. MRFs are more likely to charge processing fees when market prices are low, when recyclables are commingled and when revenue from the sale of recyclables is shared with suppliers.

Publicly Owned MRFs

Some local governments or groups of local governments (regions) own MRFs. Some facilities are operated by the local government or region (sometimes as an authority) while others have contracted operators that have experience operating such facilities and marketing material. Larger regional MRFs may have access to an expanded array of end markets both regionally and globally. This may result in the ability to collect a broader range of recyclables in more stable markets. Colleges/universities can sometimes form cooperative arrangements with local governments to combine volumes that may cost less than contracting with a private MRF.



Pictured above is the interior of Horry County's material recovery facility – an example of a publicly owned MRF.

Private Dealers

Private material dealers are the original backbone of the recycling industry. These companies specialize in one or more types of recovered material, usually paper or metals, and may agree to accept and process other material in return for receiving all of the targeted material generated by colleges/universities. A benefit of using a dealer is that they usually have significant market experience with their specific material. An example of a private dealer is Sonoco Recycling, which began as a company focused on sourcing paper to manufacture paper products. There also are many scrap metal dealers located throughout South Carolina.

Brokers

Brokers arrange for the marketing of processed material to the end market or intermediary processor on behalf of either the college/university or the processor, but do not own facilities or take actual possession of the material. Brokers usually charge a fee for their services in the form of a percentage of the total value of the sale. Brokers usually work for the end user and guarantee that end user a certain tonnage. The broker then works with many sources of the material in order to supply the tonnage it has guaranteed to clients.

End Users

End users are entities that use recovered material as a feedstock in manufacturing new products and

packaging. They purchase material processed to their own specifications. The end user may be under contract directly with the generator (such as a local government), with the processor, or with a dealer or broker. Most end users deal only in truckload quantities of at least 35,000 pounds. That means smaller generators (such as colleges/universities) are unlikely to deal with end users directly, unless they have a consistently high-quality material.

Local Specialty Entrepreneurs

Local specialty entrepreneurs are small-scale end users that provide an alternative use for material such as a company that makes building insulation from old newspapers or decorative tiles from recovered glass. While specialty entrepreneurs may be local, allowing for less costly shipping and the employment of the local community, they are unable to accept large or consistent quantities of material.

Overseas Markets

Overseas markets play an important role in the worldwide recovered material economy. The advantage to using export markets is that, in many cases, they: 1) pay the highest prices; 2) may accept material that does not have stable U.S. markets; or 3) take lower-quality material because they have laborers to sort. Most colleges/universities will not deal directly with overseas markets, but the success of these markets will impact campuses, as they often work with the processors contracting with colleges/universities. Some countries have begun restricting import of certain material, impacting the material some processors can accept as well as pricing of both revenue and fees for contamination. It is the responsibility of the collegiate recycling coordinator to remain informed of the state of recycling markets, both domestic and overseas.

State Contracts

For some recovered material, the state has negotiated contracts with specific markets. These contracts must be used by state agencies and public colleges/universities.

Private colleges/universities as well as public schools and school districts that have adopted the state's procurement code in its entirety also must use these contracts, while others may choose to use them. The S.C. State Fiscal Accountability Authority administers all state contracts. Information technology contracts are administered by the Information Technology Management Office. Contracts for goods and services are administered by the Procurement Services Office.

Definitions

In the recycling industry, many refer to "contaminants" as material that should not be included in the recycling stream. Other terms, "outthrows" and "prohibitives" are also used.

- **OUTTHROWS:** Material that would generally be acceptable as commodities within the bale type, except that they have been treated such that they are unsuitable. An example would be soiled paper or UV-damaged plastics.
- **PROHIBITIVES:** Material that, if included in the bale type over a certain level, will make the material type unusable and damaging to processing equipment. For example, ceramics in glass or colored HDPE in natural HDPE bales.

Assessing Market Potential

In order to assess the options and negotiate the best marketing arrangement for a specific college/university, the recycling coordinator should first engage in an examination of the recycling program's goals and resources in terms of the available potential markets.

Strategies for Marketing Material

Marketing recovered material is a task that is different from most functions of colleges/universities. Instead of being the purchasers of goods, they are the sellers. Some of the strategies used to market material are described below.

- **Secure Movement:** If a recycling program is most concerned with always having a market, even when prices for recycled material spike downward, the tendency is to accept a low price or sometimes no price, in exchange for always being able to move material to market. Secure movement is a particularly tempting strategy for colleges/universities, as they typically lack ample storage space. If a campus is accepting a low price or no price for their commodity, it can be tempting to lower processing standards, as the material is moving anyway. This, however, can backfire if material becomes so contaminated there is no outlet that will accept it.
- **Price:** While obtaining a high price is considered a good outcome for sellers of commodities, always "chasing the highest price" may not be the best strategy. Selling material at a higher price can work well when there is a shortage of recovered material.

What factors help determine commodity price?

- **Quality** (e.g., minimal contamination, tight, consistent bales)
- **Volume** (e.g., full truck loads, consistent supply)
- **Location** (e.g., proximity to market)
- **Competition** (e.g., particularly demand in closer proximity to end market)
- **Demand** (driven by the need for end products)
- **Price of Alternatives** (e.g., as the cost of virgin material increases, manufacturers are willing to pay more for recovered material)

Chasing the highest price can be problematic, however, when it prohibits establishing long-term relationships with end markets and causes a college/university's material to pile up.

- **Revenue and Value:** The marketplace is designed to reward value with revenue as long as the recycling coordinator knows how to balance secure movement and price. Most successful recycling programs share the revenue from their recyclables with the processor and pay the processor a fee that covers the fixed costs of the facility operation. While some recycling coordinators operate under the assumption that they are giving their processors an advantage by allowing them to keep all of the revenue from the sale of material, most private service providers with recycling experience encourage colleges/universities to keep most of the revenue. This way, both parties incur market risks, lending to a balanced partnership. For further information on how sharing revenue benefits colleges/universities and processors, see "Why share revenue?" below.
- **Long-term Contracts vs. Spot Markets:** Generally, smaller programs are more vulnerable in using spot markets, but their smaller volume of material may make long-term contracts unfeasible. Recycling coordinators who are managing smaller programs can benefit from using a few markets on a consistent basis, if possible, rather than relying on just one or choosing a new market every month. Larger programs

Why share revenue?

- If a college/university pays a processing cost, sharing revenue with the processor generally results in a lower processing cost.
- It provides incentive for the processor to maximize tonnages recovered and sold.
- It provides incentive for the marketer to obtain the highest market price possible.
- It may provide incentive for including additional material in the recycling program in the future.
- It encourages the processor to meet reporting requirements.
- Both parties share the risk during poor market times.
- It encourages colleges/universities to engage in education and outreach activities.

with consistently high tonnages will benefit more from long-term contracts, but those with larger volumes also can sell some material in the spot market.

- **Cooperative Marketing:** Cooperative marketing can be particularly beneficial for colleges/universities that generate relatively small quantities of material, as buyers typically prefer to purchase full truckloads and sellers receive more favorable pricing for full truckloads. Cooperative marketing can be as simple as staying in touch by phone with a nearby college/university and sharing a market pick-up with them. On the other hand, it can be as complex as a membership organization that assists smaller campuses with all aspects of marketing, from quality control to negotiating prices.

Resources for Identifying Markets

- **The S.C. Recycling Market Development Advisory Council (RMDAC):** RMDAC supports the economic growth of South Carolina's recycling industry by working to build and sustain markets as well as increase material recovery. RMDAC, which consists of 14 members appointed by the Governor representing industry, local governments, higher education and the public, makes recycling markets recommendations to the Governor and General Assembly each year.
- **The Green Resource Index (Index):** This publication, provided by the Office, helps colleges/universities, local governments, businesses and others locate markets for recovered material and offers a listing of companies that provide recycling equipment, products and services. Please visit www.scdhec.gov/sites/default/files/Library/OR-1715.pdf to view the Index.

Did You Know?

The Office subscribes to a commodity pricing service at www.recyclingmarkets.net.

The Office has access through this service to both historical and current market prices for a wide variety of recovered material.

Market updates are provided by email twice a month to recycling professionals by the Office. Please call **1-800-768-7348** to be added to the email list.

A Material Exchange

- **Southeastern Waste Information Exchange (SWIX):** Recycling professionals can access a number of regional and national material exchanges to assist in finding markets or alternative uses for recovered material. This can be material typically included in a recycling program, one-time specially generated material and difficult-to-manage material. This is a useful tool for recycling professionals seeking markets for industrially generated material that may not be found in the residential waste stream. Please visit www.wastexchange.org for more information.

Additional Resources for Finding Markets

- Association of Plastic Recyclers (APR), www.plasticsrecycling.org
- Glass Packaging Institute, Cullet Processors, www.gpi.org/recycling/where-recycle
- Steel Recycling Institute, Steel Recyclers, www.steelsustainability.org

References & Resources for Chapter 10

- Association of Plastic Recyclers (APR), www.plasticsrecycling.org
- DHEC, The Green Resource Index, www.scdhec.gov/sites/default/files/Library/OR-1715.pdf
- EPA, Resource Management, www.epa.gov/smm
- EPA, SMM Web Academy – How to Negotiate Your Contract with Waste Haulers, <https://archive.epa.gov/smm/web-academy/web/html/may12.html>
- Glass Packaging Institute, Cullet Processors, www.gpi.org/recycling/where-recycle
- Institute of Scrap Recycling Industries, Inc., www.isri.org
- National Association for PET Container Resources (NAPCOR), www.napcor.com
- NAPCOR, Reports & Resources, napcor.com/reports-resources/
- Recyclingmarkets.net Commodity Pricing Service, recyclingmarkets.net
- R.W. Beck (for PA DEP), "Effective Contracting for Recycling Programs," (Training Session), April 2006
- S.C. State Fiscal Accountability Authority, Procurement Services, www.procurement.sc.gov/PS/PS-index.phtml
- Steel Recycling Institute, www.steelsustainability.org

Recordkeeping & Reporting

CHAPTER 11

State-supported colleges/universities ARE REQUIRED per the S.C. Solid Waste Policy and Management Act of 1991 (Act) – S.C. Code of Laws §§ 44-96-10 et seq. **to report the type and amount of material recycled and all products purchased containing recycled-content material by September 15 of each year** to the S.C. Department of Health and Environmental Control (DHEC). The Act sets a goal that at least 25 percent of all product purchases contain recycled-content material.

The Importance of Maintaining Recycling Records

There are several reasons to maintain recycling program data. Maintaining consistent records can help:

- **Provide feedback to those involved in the program** – haulers, auxiliary services, students and staff;
- **Provide results to college/university administration** regarding the benefits and/or cost benefits of the programs;
- **Gain an understanding of the impact** of specific program enhancements or outreach efforts;
- **Identify additional opportunities** for waste reduction or recycling initiatives (e.g., adding a commodity) and program improvements; and
- **Meet the state’s reporting requirements.**

Ideally, the data collected will provide the campus with information to assess how well waste reduction/recycling goals are being met.

Types of Recycling Data to Maintain

Tracking the success of a program may require tracking many different types of data – as one metric rarely tells the complete story. For example, a reduction in overall tons recycled could be a result of reduced participation in recycling programs, a decline in employment or an increase in source reduction efforts.

Similarly, an increase in tons of solid waste disposed of may at first seem like a negative reflection on a recycling program. If the college/university, however, experienced a significant increase in employment or processed an abnormal amount of purchases (leading to a large amount of non-recyclable packaging), this would increase the amount of waste generated. There also is a

positive relationship between economic health and waste generation.

Quantitative Data

There are several types of quantitative data a college/university can track including:

- **Demographic Information** – The number of full-time as well as part-time students, faculty and staff;
- **Container Information** – The quantity and locations of recycling and garbage containers;
- **Tonnage Data**
 - Tons of waste disposed of from operations and
 - Tons of material recycled;
- **Cost and Revenue Information**
 - The cost of recycling services (e.g., collection, processing, containers, maintenance),
 - The cost of garbage services (e.g., collection, disposal, containers, maintenance) and
 - Revenues received from recyclables.

It is advantageous to track quantitative data monthly so that the factors that influence the quantities of material collected and the cost of recycling this material can be understood. Data might be analyzed in the following ways:

- **By location** (e.g., by building to understand which generate the most/least recyclables);
- **By material type**, based on quantities processed. Also, a periodic review of the amount of potentially recyclable material still being disposed of in a landfill can be determined by a waste audit;
- **By month or season;**
- **By calendar or fiscal year;** and/or
- **Per capita.**

Metrics to Use

Several different types of metrics can be used to understand the effectiveness of waste reduction and recycling programs as well as program changes, a specific outreach campaign or other educational efforts. Four common metrics are described in the definition boxes below.

It is more challenging, however, to measure participation in college/university programs (versus in a town's curbside recycling program). One way to measure participation is through surveying students and staff about their level of participation although their responses may not precisely reflect their actual participation.

Other metrics may be geared to understanding the costs of the recycling program.

Definition

A METRIC is a standard of measurement that can be used to quantitatively assess the college/university's solid waste and recycling programs.

Definition

RECYCLING RATE is the amount of material recycled relative to the total amount of waste generated. Recycling rates are calculated using the following formula:

Tons of waste recycled

Tons of waste recycled + Tons of waste disposed of

Definition

PARTICIPATION RATE is the proportion of those that participate in a program on a regular basis relative to the number of potential participants:

Number of individuals participating
in a recycling program (monthly)

Total number of individuals eligible
to participate in the program

Qualitative Data

To help make more complete sense of the quantitative data gathered and to ensure that all pertinent information is captured, it is important to maintain qualitative information about the college/university's recycling program such as:

- **Names and contact information of service providers** for all recycling programs;
- **Material included in or added to recycling or diversion programs** (e.g., addition of food waste to a composting program);
- **Changes to solid waste and recycling programs** (e.g., addition of buildings to a recycling program, switch to single-stream recycling collection);
- **Implementation of waste reduction programs;**
- **Education/outreach efforts;**
- **Changes to recycling/sustainability plans or goals;**
- **Changes in staff/contracted service providers; and**
- **Changes in contract terms.**

Definition

TOTAL POUNDS RECYCLED PER CAPITA measures the average per-capita tons (or pounds) generated in a certain time period (e.g., annually, monthly, daily). Calculate total pounds recycled per capita using this formula.

Total pounds recycled in time period

Total population

Definition

TOTAL POUNDS DISPOSED OF PER CAPITA measures the average amount of waste each program participant disposed of in a certain time period (e.g., annually, monthly, daily). Estimate total pounds disposed of per capita using this formula.

Total pounds disposed of in time period

Total population

Documenting such information allows the recycling coordinator to determine the impact of changes on the performance of the recycling program by observing how they affect metrics. In addition, the recycling coordinator might consider keeping a log of lessons learned and best practices.

What to Include in Your Material Management Plan

A college/university material management program should have a plan that includes goals and objectives and describes how the institution plans on reaching those goals and objectives. Developing and following a plan for reducing waste helps keep the program on track and ensures that the program goals are in line with college/university goals. Recordkeeping and reporting help assess how well the program is progressing.

Elements typically included in a material management plan are as follows.

- **A Vision Statement** provides a broad statement about the goals the college/university would like to achieve pertaining to material management.
 - **EXAMPLE:** The campus aims to be a leader in implementing effective solid waste management solutions that result in achieving a 50 percent diversion from landfill disposal by the year 2025.

Definitions

NET COSTS are the total costs of the program minus the income from the program (such as revenue from the sale of recyclable material). To be accurate, all costs should be accounted for such as direct costs (e.g., labor, transportation, processing, container costs), the cost of education and outreach programs as well as indirect costs.

INDIRECT COSTS are more challenging to estimate and include administrative and overhead costs such as the costs incurred by procurement staff to select vendors and equipment as well as administrative costs associated with paying service providers, recordkeeping, etc. It can help to compare the net cost of the recycling program (on a dollar-per-ton basis) to the cost of disposing of the same amount of material. In some parts of the country (e.g., where tipping fees are high), this metric shows the fiscal reward of recycling.

- **Guiding Principles** are statements regarding the college/university's broad philosophy that guides the campus irrespective of changes in its goals, strategies or management.
 - **EXAMPLE:** The college/university's material management program will work with the administration to ensure that waste reduction and recycling benefits are incorporated into campus culture as appropriate.
- **Goals** should be clear, succinct and measurable when possible. Ideally, all goals should have observable outcomes. Goals also should be realistic and associated with a time frame, if at all possible.
 - **EXAMPLE:** Achieve a 50 percent waste diversion rate against current levels by 2025.
 - **EXAMPLE:** Educate the campus community about the environmental, economic and health merits of sustainable waste management practices at least twice annually.
 - **EXAMPLE:** Hold one event annually directed toward waste reduction efforts.
- **Strategies, Program Options and Priorities:** A gap analysis can be used to understand the program needs and opportunities for improvement. From the gap analysis, strategies and program options will be

Best Practices for Using Databases

- **Keep the database as simple as possible without compromising your data needs.**
- **Use widely accepted software** – preferably software that can perform calculations on quantitative data.
- **Double check formulas.**
- **Enter data regularly** (at least monthly especially after special events).
- **Back up files regularly.**
- **Train others how to update data** (particularly new staff).
- **Label data units** (e.g., pounds, tons).
- **Indicate sources of data and contact information for all data elements.**

identified to help bridge the gap between the current situation and the goals to be achieved.

- **EXAMPLE:** A gap analysis suggests that there is a need for increased participation in the program to reach the established goals. Strategies to improve participation include enhanced education and outreach, an increase in the number of recycling containers and a focus on special event recycling.
- **Resources Required:** In order to implement the strategies, an estimate of capital, operating and personnel costs (or personnel hours) required for implementation is needed. It can be time-consuming and challenging to obtain approval for additional resources, so having a well laid-out plan and vision as well as goals and guiding principles to back the plan will help justify the request. It also is helpful to keep administrators informed throughout the process and invite them to participate in planning.
- **Continuous Improvement:** This includes a methodology for assessing progress towards goals to help keep the program on track. Program performance is monitored at appropriate intervals, often determined by the needs of individual program components. In general, a program evaluation should be conducted at least annually. It is important to ensure that targeted data is generated to allow proper assessment.

Auditing Program Performance

Whether recycling collection is provided by a private hauler, a local government or in an open system by multiple private haulers (which is more challenging, but still possible), the recycling coordinator can gain insights about the program by auditing recycling collection operations.

For colleges/universities, this means regularly checking points of collection immediately prior to and immediately following recycling pick-up. Auditing performance will help to determine:

- **If the hauler is careful to return the bins/carts properly;**
- **If the hauler is mixing recyclables with garbage;**



- **If participants are contaminating recyclables with trash;** and
- **How many areas participate in recycling.**

Similarly, auditing points of generation can be done any time, but the most information about how the hauler/ staff collecting the recyclables is performing is obtained by visiting them immediately before and after recycling collection.

These visits will help determine:

- **If collection is frequent enough or too frequent** (e.g., how full are the containers at collection time?);
- **If the collection area is adequately maintained** and, if not, whether this is due to careless service or students abusing the site;
- **If there are contamination issues that need to be addressed;**
- **If the site is adequately secure and easy to use;** and
- **If containers are properly placed.**



Additional information about the recycling program can be obtained by conducting the following additional steps.

- **Inspection of Waste:** Recycling professionals can inspect waste collected. Inspections can be relatively quick (e.g., selecting bags to break open and visually inspecting their contents) or more involved (e.g., sorting waste into specific categories and weighing it), but a checklist or documentation process of some sort is necessary. The inspection can help the recycling coordinator:
 - Identify additional items that could potentially be targeted for recycling;
 - Identify material that can be recycled but is frequently disposed of to include in targeted education/outreach campaigns; and
 - Provide information regarding specific collection points that may benefit from additional education/outreach.
- **Review of Hauler Data:** The regular provision of data must be written into any contract for recycling collection. Such data should be reviewed consistently, considering seasonality, so that any deviations can be addressed.

- **Surveys:** Recycling coordinators can survey participants to gauge the success of their efforts as well as identify areas for improvement. Potential survey questions are listed below.
 - If you don't participate in the recycling program, why not?
 - Are there aspects of the program that are confusing?
 - Is the service adequate (e.g., bin location, collection timing)?
 - Are bins/containers of adequate size and in good condition?

Surveys can be advertised and/or conducted through email or in person at events. Online surveys are a cost-effective means of obtaining information. To encourage participation in a survey, a prize drawing can be offered.



Reporting

The S.C. Solid Waste Policy and Management Act of 1991 requires that all state-supported colleges/universities and state agencies (as well as county governments) report recycling data annually to DHEC. Recycling data also is collected from municipalities, businesses and the recycling industry, but these entities are not required to report.

All data is collected on a fiscal year basis (July 1 to June 30) and is carefully vetted and combined with disposal data to calculate recycling and disposal rates for the state and individual counties. This information can be found in "The South Carolina Solid Waste Management Annual Report."

Colleges/universities and other entities submit recycling data to DHEC using Re-TRAC Connect – an online data management system that allows users to input, access and update their information at any time.

New users need to register for an account before they can enter data into Re-TRAC Connect. To register, please visit connect.re-trac.com/login.

U.S. Environmental Protection Agency (EPA) Tools for Tracking

EPA has several online tools that can track progress in waste reduction and recycling and present data in a meaningful way.

- **Putting Results in Perspective:** Recycling coordinators can translate a college/university's recycling success using EPA Waste and Recycling Model (WARM) – available at www.epa.gov/epawaste/consERVE/tools/warm.

Output from WARM can be entered into EPA's Greenhouse Gas Equivalencies Calculator – available at www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. The resulting output can be expressed in terms that are more readily understood. For example, results can be translated into:

- Annual emissions from ___ passenger vehicles;
- CO₂ emissions from the consumption of ___ gallons of gasoline;
- CO₂ emissions from the electricity use of ___ homes for one year;
- **WasteWise Tools:** EPA's WasteWise program provides a downloadable Excel-based spreadsheet that can be used to track results. It includes data such as the amount of material recycled, revenue received from the sale of the material and avoided disposal costs. It also includes a tab to track recycled-content material purchased as well as waste reduction efforts. Visit www.epa.gov/smm/wastewise.



Preserving Resources,
Preventing Waste

Chapter 11 Notes

References & Resources for Chapter 11

- ASTM International, Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste, www.astm.org/Standards/D5231.htm
- DHEC, Volume-to-Weight Conversion Factors, www.scdhec.gov/sites/default/files/Library/CR-011175.pdf
- EPA, Best Practices for WasteWise Participants, www.epa.gov/smm/best-practices-wastewise-participants
- EPA, Greenhouse Gas Equivalencies Calculator, www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
- EPA, Standard Volume-to-Weight Conversion Tables, www.epa.gov/sites/production/files/2016-04/documents/volume_to_weight_conversion_factors_memorandum_04192016_508fnl.pdf
- EPA, Waste Reduction Model (WARM), www.epa.gov/warm
- Re-TRAC Connect, connect.re-trac.com/login
- S.C. Solid Waste Policy and Management Act of 1991, www.scstatehouse.gov/code/t44c096.php

Environmentally Preferred Purchasing

CHAPTER 12


Definition

ENVIRONMENTALLY PREFERRED PURCHASING (EPP) – also known as green purchasing – is the procurement of products and services that have a reduced effect on human health and the environment when compared with competing products and services that serve the same purpose. This comparison may consider raw material acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance and disposal of the product or service. EPP emphasizes purchasing products that:

- **Use less water and energy to make products;**
- **Conserve resources;**
- **Reduce pollution;**
- **Are designed to last;**
- **Are less toxic** (protecting the health and safety of campus staff and visitors) and minimize harmful emissions; and
- **Are reusable** (reducing waste).

Buying products that can be recycled and contain recycled content is a basic part of any green purchasing program. Recycling only works when consumers, businesses and organizations buy products made with recycled material. Completing the recycling loop sustains markets for recycled material, stimulates the development of environmentally friendly products and creates green jobs. Colleges/universities have a unique opportunity with their collective purchasing power to protect human health and the environment as well as have a significant influence on the success and growth of green products and services.

- **Make a commitment to purchase products made from recycled material.** Work with procurement officers and administrators to focus on South Carolina colleges/universities' goal of purchasing 25 percent recycled-content products as established in The S.C. Solid Waste Policy and Management Act of 1991 (Act). Also, be aware of South Carolina's EPP



25%

More to Know

Below are additional resources available from the U.S. Environmental Protection Agency (EPA) and others to identify environmentally preferable products.

- Conservatree (provides links to manufacturers of recycled-content paper products), <http://conservatree.org/>
- EPA, Comprehensive Procurement Guidelines Directory, www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program
- EPA, Green Purchasing Guides (includes specific guides for office supplies, cleaning products, copiers, conferences and carpet as well as implementing EPP), www.epa.gov/greenerproducts
- National Association of State Procurement Officials (offers a comprehensive guide on EPP including the concept and benefits of green purchasing, proven steps on the implementation of a green purchasing program and links to other resources), www.naspo.org/green/index.html#sectiontwo
- S.C. Environmentally Preferred Purchasing Policy, <https://procurement.sc.gov/policy#Environmentally%20Preferred%20Purchasing%20Policy>
- S.C. State Fiscal Accountability Authority, Procurement Services (SCFAA Procurement), (provides the "State of South Carolina Guide for Recycled Products"), www.procurement.sc.gov/files/RecycleGuide.doc

Policy. Consider encouraging your campus to establish an EPP-related goal if it has not yet done so. It's important to remember that buying recycled-content products creates a market for the material colleges/universities divert.

- **Determine the availability of green options when seeking products and services.** Many resources are available to identify recycled-content products and eco-friendly services including EPA and the S.C. Department of Health and Environmental Control's Office of Solid Waste Reduction and Recycling (Office). See More to Know on the previous page. Also consider asking procurement officials if any college/university suppliers offer green alternatives – vendors often have options for interested customers. SCFAA Procurement maintains the S.C. Guide for Recycled Products at www.procurement.sc.gov.

- **Calculate the cost.** Recycled-content products may cost more than comparable virgin products with cost differentials varying by type, region and market conditions. Even with higher costs, many colleges/universities recognize the need to purchase recycled-content products and do so via preferential purchasing mechanisms. Price preferences allow for the purchase of green products and services even if they are more expensive than comparable options. In South Carolina there is a 7.5 percent price preference as designated by the Act. When comparing prices of products and services to prices of green alternatives to determine the lowest bid, competing products must have 7.5 percent added to their bid prices (new price = bid price times 1.075). See Figure 5.1.

7.5%

South Carolina's EPP Policy



The state's EPP policy – developed by the Office, SCFAA Procurement and others – was officially unveiled in October 2009.

The mission of the policy is to reduce the environmental and human health impacts of state government and publicly funded college/university operations by integrating environmental considerations into their procurement processes.

For the complete policy, please see the Resource Section at the end of this guide.



FIGURE 5.1: Price Preference Pen Test

PEN A	PEN B
	
<p>The Cheapest, Low-Quantity Ballpoint Pen with STANDARD Content</p>	<p>The Cheapest, Low-Quantity Ballpoint Pen with RECYCLED Content</p>
<p>\$1.31 Per 12-Pack</p>	<p>\$1.39 Per 12-Pack</p>
<p>\$1.31 X 1.075 = \$1.40825</p>	
<p>Since the recycled-content pens are less than the standard pens + the 7.5 percent price difference, the EPP Policy indicates that the recycled-content pens should be the ones purchased.</p>	

Definitions

When buying recycled-content products, two terms are frequently used: **POST-CONSUMER** and **PRE-CONSUMER**.

- **POST-CONSUMER** is material that comes from products used by consumers and collected for recycling.
- **PRE-CONSUMER** is material that is not used by consumers, but rather collected as waste during manufacturing (e.g., paper trimmings at a paper mill).

Choosing products with a higher content of **post-consumer** material helps sustain local recycling programs.



The Comprehensive Procurement Guideline Program

The Comprehensive Procurement Guideline (CPG) program is part of EPA's continuing effort to promote the use of recycled material.

While directed primarily at executive branch government agencies, CPG information is helpful to anyone interested in purchasing recycled-content products. The CPG designates items in the following eight product categories:

- **Paper;**
- **Automotive;**
- **Construction;**
- **Transportation;**
- **Park and recreation;**
- **Landscaping;**
- **Non-paper office supplies; and**
- **Miscellaneous.**



Under the Resource Conservation and Recovery Act, the requirement to purchase an EPA-designated product containing recovered material applies to "procuring agencies" that spend more than \$10,000 a year on that item.

Procuring agencies include all federal, state and local agencies or government contractors that use appropriated federal funds.

For more information on CPG, visit www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program.

List of Resources

WORKSHEET A: Selecting Vendors for Recycled-Content Products Worksheet	32
WORKSHEET B: Tracking Recycled-Content Purchases Worksheet	32
WORKSHEET C: Conducting a Waste Audit	33
WORKSHEET D: Records Review – Current Waste Management Costs.....	37
WORKSHEET E: Interviewing Recycling Service Providers.....	39
WORKSHEET F: Calculating Avoided Disposal Costs & Net Costs of a Recycling Program.....	41
WORKSHEET G: Recycling Awareness Survey	44
S.C. Environmentally Preferred Purchasing Policy	XX



WORKSHEET A: Selecting Vendors for Recycled-Content Products

Product Requested: _____

Number of Units Requested: _____

Solicitation Number: _____ Duration of Desired Contract: _____

Buyer: _____

Organization: _____

PERCENTAGE AND DEFINITION OF RECYCLED CONTENT REQUESTED IN BID

Pre-consumer %

Post-consumer %

Total Recycled Content %

BIDDERS (Check the successful bidder.)

BIDDER	PRE-CONSUMER	POST-CONSUMER	TOTAL	PRICE
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				

Price Preference Paid (if any) \$ _____

Was this a cooperative purchase? YES NO

If yes, list participants: _____

Total Dollars/Units Purchased: \$ _____ /# _____

(Contract vendors should be required to provide information on actual usage.)

Was there any good or bad feedback from users? _____

WORKSHEET B: Tracking Recycled-Content Purchases

Buyer Name: _____

Organization: _____

Phone: _____ Fax: _____

E-mail: _____

Quarter and Year of Report (by fiscal year): _____

RECYCLED-CONTENT PURCHASES				
Order No. or Contract No.	Category Code	Vendor	Product	Dollar Amount
TOTAL:				

WORKSHEET C: Conducting a Waste Audit

Use this worksheet to get a more detailed profile of the amounts and types of waste generated at your campus than a records review and/or walk-through can provide.

When conducting a waste audit (also known as a waste sort), you can either choose to collect all waste generated during the day or select a representative sample from each collection container. Some colleges/universities may choose to conduct a visual audit instead by estimating the amount of specific types of material in each container.

Determine the size and location of the area in which you will sort the waste. If large quantities will be sorted, a large, flat area such as a parking area works well. It may be possible to use large indoor rooms for smaller waste sorts. Obtain building management approval and work with them to conduct the waste audit when it will cause the least disruption. A team of three or four is usually adequate for a small- to medium-sized building. Expect the waste audit to take a few hours.

MATERIAL NEEDED			
Broom/shovel	Clipboard	Pens and/or markers	Scale
Camera (digital or video)	Dustpan	Plastic sheeting/drop cloth	Trash bags (plastic)
Cardboard boxes	First aid kit	Rubber gloves	A copy of this worksheet

REMEMBER to wear old clothes, long pants, long sleeves and closed shoes.

1. Begin the waste audit.

- Assemble the waste to be sorted using either one day's worth of waste or an otherwise representative sample.
- Weigh the empty containers that the sorted waste will be placed into and record these weights on a label on each container.
- Sort the waste sample by major material type categories (e.g., paper, plastic, glass, metal, compostable organics, other)
- If needed, further sort each major material types into more specific component subcategories (e.g., glass could be sorted into clear, green, brown or other)
- Place the sorted material into separate labeled containers.

2. Calculate the net material category weight.

- Weigh each filled waste container and subtract the weight of the container for the net material type weight. Record the net material type weight on the space provided on the Waste Audit Form, column A (beginning on page 18). If you are not sorting into more detailed material subcategories, proceed to Step 2-C.
- If you sorted the material types into subcategories, add their net weights and record the total net material weights on the Waste Audit Form.
- Add all the total material type weights to determine the total sample weight and record this total at the bottom of the Waste Audit Form.

3. Calculate the percent to total sample weight.

- Use this formula to calculate the percentage each material type represents of the total sample weight.

$$\frac{\text{net material type weight}}{\text{total sample weight}} \times 100 = \text{percent of total sample weight} \%$$

- Record data in column B on Waste Audit Form. Use the data in the Percent of Total Sample Weight column to create a pie chart to help compare the percentages of the different material types in the waste stream.

Continued on the following page

4. Estimate total annual weight generation by material type.

A. If you sorted one (typical) day's worth of waste, estimate the weight of waste generated for each material type annually using the following formula.

$$\frac{\text{net material type weight}}{\text{net material type weight}} \times \frac{\text{number of working days per year}}{\text{number of working days per year}} = \frac{\text{weight of material generated annually}}{\text{weight of material generated annually}}$$

B. If you sorted a representative sample, first weigh or estimate all the waste generated by your facility that day. Calculate the amount of waste generated annually for each material type by using the following formulas.

$$\frac{\text{total sample weight (all types)}}{\text{total sample weight (all types)}} \div \frac{\text{total waste amount generated per day}}{\text{total waste amount generated per day}} = \frac{\text{sort multiplier}}{\text{sort multiplier}}$$

$$\frac{\text{net material type weight}}{\text{net material type weight}} \div \frac{\text{sort multiplier}}{\text{sort multiplier}} \times \frac{\text{number of working days per year}}{\text{number of working days per year}} = \frac{\text{annual weight of material}}{\text{annual weight of material}}$$

AUDIT SPECIFICS	
Date of Audit:	Building/Department(s):
Source of Sample:	
Sample Collected (specify weight):	<input type="checkbox"/> All Waste <input type="checkbox"/> Representative Sample
Total Weight of Waste Generated on Audit Date:	POUNDS
Team Members Conducting the Audit:	
Factors Affecting the Audit:	

MATERIAL	COLUMN A Net Material Type Weight	COLUMN B Percent of Total Sample Weight (All Material Types)	COLUMN C Weight of Material Type Generated Annually
PAPER			
Adding machine tape			
Cardboard			
Envelopes (can include windows)			
Form-feed paper			
Glossy paper			
Greeting cards			
Legal pads/Post-its			
Magazines			
Newspapers and inserts			
Paperboard (e.g., cereal boxes)			
Receipts			
Telephone books			

MATERIAL	COLUMN A Net Material Type Weight	COLUMN B Percent of Total Sample Weight (All Material Types)	COLUMN C Weight of Material Type Generated Annually
PAPER <i>(continued)</i>			
White/colored paper			
Other/mixed paper			
PLASTIC			
PLASTIC BOTTLES			
#1 PET			
#2 HDPE			
#3 Vinyl			
Other/Mixed plastic bottles			
PLASTIC FILM			
#2 HDPE			
#4 LDPE			
Other/Mixed plastic			
METAL			
Aluminum cans			
Aluminum foil			
Steel cans			
Other ferrous metals			
Other/Mixed metals			
GLASS			
Brown			
Clear			
Green			
Other/Mixed glass			
BANNED ITEMS			
Appliances			
Electronics			
Lead-acid batteries			
Tires			
Used motor oil			
Used oil filters			
ORGANICS			
Cooking oil			
Food scraps			
Yard trimmings (e.g., grass clippings, leaves, tree limbs)			
MISCELLANEOUS			
Antifreeze			
Carpet			
Chemicals			

Continued on the following page

MATERIAL	COLUMN A Net Material Type Weight	COLUMN B Percent of Total Sample Weight (All Material Types)	COLUMN C Weight of Material Type Generated Annually
MISCELLANEOUS <i>(continued)</i>			
Construction and demolition debris			
Fluorescent bulbs			
Furniture and cabinets			
Mattresses			
Paint			
Pallets			
Rechargeable batteries			
Super sacks			
Textiles			
Toner/inkjet cartridges			
ITEMS NOT LISTED			

WORKSHEET D: Records Review – Current Waste Management Costs

Use this worksheet to record information about how solid waste is removed from your campus and to help estimate the total annual cost of waste management services. Company records (e.g., hauling contracts, maintenance, operating logs, invoices, waste removal records) will be the primary sources of information needed to complete this information. Maintenance staff also may be able to provide information.

Waste removal costs can be charged via a flat fee or a per-pull charge that is levied each time a container is hauled or emptied. There also can be container rental and maintenance fees (charged monthly, quarterly or annually). In addition, some haulers charge a disposal fee based on the weight of trash. This worksheet is designed to capture all of those costs. If waste removal practices vary significantly among buildings or if different waste contractors are used, make copies and record the information separately for each building or service provider.

FACILITY INFORMATION	
Building:	Department:
Name of Contact:	
Telephone Number:	Email:

WASTE HAULING AND DISPOSAL COSTS				
PART A: Hauler Contact Information				
Name of Hauler:		Contact:		
Telephone Number:		Email:		
Contract Expires:				
PART B: Containers and Removal Schedule				
container	TYPE (dumpster/roll-off, compactor)	SIZE	FREQUENCY OF COLLECTION (number per day/week/month)	DAY(S) OF WEEK COLLECTED (or upon request)
1				
2				
3				
4				
5				
PART C: Waste Management Charge: (if charged as flat fee or part of rent)				
$ \begin{array}{ccccccc} \$ \underline{\hspace{2cm}} & & \times & & \underline{\hspace{2cm}} & = & \$ \underline{\hspace{2cm}} \\ \text{waste removal fee} & & & & \text{number of times per year} & & \text{annual waste management charge} \end{array} $				

Continued on the following page

PART D: Waste Management Charge by Weight or Volume: Indicate the total and/or per-container/per-unit waste hauling fee if you are charged a fee by weight and volume.

container	PER-UNIT TRASH HAULING FEE	X	UNIT OF WEIGHT OR VOLUME	X	ANNUAL UNITS	=	TOTAL CHARGE
1		X		X		=	\$
2		X		X		=	\$
3		X		X		=	\$
4		X		X		=	\$
5		X		X		=	\$

PART E: Waste Removal Charge: If charged per-pull, indicate the total and/or per-container pull fee.

container	PER-PULL FEE	X	NUMBER OF PULLS PER YEAR	=	TOTAL ANNUAL PULL FEES
1		X		=	\$
2		X		=	\$
3		X		=	\$
4		X		=	\$
5		X		=	\$

PART F: Container Rental and/or Maintenance Fees: Indicate the per-container and/or total container rental/maintenance fees per year.

container	MONTHLY OR QUARTERLY RENTAL/ MAINTENANCE FEE	X	ANNUALIZATION MULTIPLIER (12 if monthly fee or 4 if quarterly fee)	=	TOTAL ANNUAL MAINTENANCE RENTAL FEES
1		X		=	\$
2		X		=	\$
3		X		=	\$
4		X		=	\$
5		X		=	\$
TOTAL ANNUAL FEES		X		=	\$

PART G: Waste Disposal Fee: (if charged separately for disposal)

\$ _____	X	_____	=	\$ _____
charge per ton (or cubic yards – CY)		tons (or CY) per year		total annual disposal fee

PART H: Total Waste Management Costs Per Year

Sum of Applicable Annual Charges and Fees (Parts C through G):	\$ _____
--	----------

Quick-Reference Measurement Chart

Weight: 1 Ton = 2,000 Pounds	Volume: Common Container Sizes - 4, 6, 8, 20, 30, 40 Cubic Yard
-------------------------------------	--

Check with your vendor to verify what size container you have.

WORKSHEET E: Interviewing Recycling Service Providers

When looking into starting or improving a recycling program, it is important to research services provided by different recyclers. This worksheet provides a format for organizing information collected while you are researching options. Also, remember that you may be able to negotiate with the service providers, particularly in situations where several service providers operate in the area.

It is important to ensure that storage/collection containers will fit in areas available and will provide ample room for loading/unloading. Most haulers that collect recyclables also collect trash – and do so under the same contract – so you likely will be asking about both recyclables and trash collection services. If your program requires a compactor, be sure to let potential vendors know.

In addition to interviewing potential haulers for recycled material, it is important to understand your current waste hauling contracts, ability to reduce waste container sizes/number of pulls and length of contract. In general, it is recommended that a written contract be developed instead of a verbal agreement.

SERVICES	RECYCLER #1	RECYCLER #2	RECYCLER #3
NAMES			
Material collected includes: <ul style="list-style-type: none"> • PAPER GRADE; • METAL; • PLASTIC; and • OTHER MATERIAL. 			
Is there a minimum VOLUME or WEIGHT REQUIREMENT for collection?			
Is there a FREQUENCY OF COLLECTION SCHEDULE or are ON-CALL SERVICES provided?			
What are the FEES CHARGED for collection of recycling and waste containers?			
What is the FEE FOR MATERIAL PROCESSING or disposal?			
What are the PRICES PAID for material? (If applicable, indicate material types, how they are sorted and whether loose/baled and associated revenues per ton.)			
Must recyclables be SEPARATED or can they be MIXED/COMMINGLED?			
What are the CONTAINER SIZES AND TYPES AVAILABLE? (Are indoor and/or outdoor containers provided?)			

Continued on the following page

SERVICES	RECYCLER #1	RECYCLER #2	RECYCLER #3
NAMES			
What are the CONTAINER RENTAL AND/OR MAINTENANCE FEES? (Do they differ for trash and recyclables?)			
Are MONTHLY REPORTS provided showing the tonnages or cubic yards recycled and disposed of?			
Is a BALER PROVIDED for corrugated cardboard or other material? Is a FEE CHARGED for providing one?			
Is TRAINING PROVIDED? Is a FEE CHARGED for this service?			
Is help PROVIDED TO DESIGN a recycling program and/or conduct a walk-through of the facility? Is a FEE CHARGED for this service?			
What ability/experience is available in providing EDUCATIONAL MATERIAL? What is the COST of this material?			
Can CONTAINER SIZES be "changed out" during the contract? Is a FEE CHARGED for doing so?			
HOW MANY YEARS has this company been in business?			
REFERENCES			

WORKSHEET F: Calculating Avoided Disposal Costs & Net Costs of a Recycling Program

By implementing a waste reduction or recycling program, a college/university can potentially realize savings and/or revenue due to:

- **Reduced trash collection and disposal costs;**
- **Reduced purchasing costs for material that is no longer needed** (e.g., disposable cups, plates); and
- **Revenues from the sale of recyclables.**

There is a cost for implementing waste reduction and recycling programs. Recycling is a service and collectors are paid to provide this service.

Much of the information needed to complete this form is derived from Worksheets C, D and E as well as from purchasing records and hauler reports. You may wish to fill out a separate worksheet for each material type or category of material being targeted for recycling or source reduction if you are trying to compare the cost

differences between potential programs. Otherwise, combine material on one worksheet.

Because it is nearly impossible to have 100 percent diversion due to contamination and participation, the calculations estimating the amount of waste to be diverted use a conservative assumption that 70 percent of the targeted material will be recycled/source reduced.

The worksheet is arranged as follows:

- **PART 1: Estimating Potential Reduction in Garbage Collection/Disposal Costs;**
- **PART 2: Estimating Reduced Purchasing Costs and Potential Revenues;**
- **PART 3: Estimating Recycling and Waste Reduction Program Costs; and**
- **PART 4: Estimating Net Costs (Savings).**

PART 1: Estimating Potential Reduction in Garbage Collection/Disposal Costs (Refer to Worksheet C, "Conducting a Waste Audit," for this information.)				
A. BY VOLUME: Use this formula if you performed a visual audit of the waste stream or if you calculated volumes during a waste audit.				
_____	X	_____	=	_____
percent of waste stream comprised of target material		total cubic yards (CY) disposed of annually		CY targeted for diversion
_____	X	.70	=	_____
CY targeted for diversion				CY expected for diversion
_____	÷	_____	=	_____ %
CY expected for diversion		CY total volume of disposed waste		percent of waste stream expected to be diverted
B. BY WEIGHT: Use this formula if you calculated weight in the waste sort and if your hauler will provide disposal weights for your dumpster(s).				
_____	X	.70	=	_____
pounds of targeted material disposed of per year				pounds expected for diversion per year
_____	÷	_____	=	_____ %
pounds expected for diversion per year		total weight of waste disposed of (from hauler) per year		total expected annual diversion rate
C. ESTIMATED TOTAL ANNUAL COSTS SAVED ON WASTE COLLECTION/DISPOSAL: Campuses are often able to save money by reducing the number of times per week the dumpster(s) are emptied, reducing the size or number of dumpsters and/or by reducing disposal fees. Ask your waste hauler if disposal costs can be reduced if your campus reaches its expected diversion. Identify potential cost savings by category. To develop a rough estimate of potential cost savings, use the following calculation.				
_____	÷	_____ %	=	_____
annual waste management costs for disposed of waste (see Worksheet B)		expected diversion rate		potential annual cost savings
NOTE: Potential annual cost savings estimated using the formula above will likely overstate cost savings somewhat. Speaking with your hauler about your options will provide you with the most accurate estimate. Reducing the number of pulls/times per week the dumpster(s) is/are emptied will yield a more significant cost savings than simply reducing the size of your containers. Be mindful, however, that it is important to ensure: waste is collected as often as necessary to avoid odor and vectors; and that waste collection containers and pull schedule accommodate an college/university's peak times of operation.				

PART 2: Estimating Reduced Purchasing Costs and Potential Revenues

Waste reduction and recycling programs can result in reduced costs. In addition, you may be able to earn revenue from the sale of recyclables. This part of the worksheet helps to estimate reduced purchasing costs and potential revenue associated with your program.

- **AVOIDED PURCHASING COSTS:** In some cases, purchasing costs can be avoided due to waste minimization efforts being implemented. For example, switching to reusable plates, coffee cups or utensils can mean that fewer disposable items are purchased in the first place. Refilling toner cartridges can be less costly than purchasing new ones and implementing a double-sided print policy can reduce the amount of paper purchased.
- **REVENUE SHARES:** Some recyclers may pay for certain recovered material. Ask potential service providers about earning revenue and estimate the revenue earned per material type. Worksheet E provides a form to use for interviewing recyclers and recording such information.
- **SUMMARY OF COST SAVINGS/REVENUES BY TARGETED MATERIAL TYPES:** Fill in the information in the table below for each material type targeted, then add together the estimated annual cost savings and revenue for all material types to find the total estimated cost savings plus revenues.

WASTE REDUCTION OR RECYCLING ACTIVITY	WASTE MATERIAL BEING REDUCED	AMOUNT OF WASTE REDUCED PER YEAR	ANNUAL WASTE REMOVAL COST AVOIDED (i)	ANNUAL REDUCTION IN PURCHASING COSTS (ii)	ESTIMATED ANNUAL REVENUES FROM MATERIAL (iii)	ESTIMATED ANNUAL COST SAVINGS & REVENUE (i+ii+iii)
EXAMPLE: Replace paper plates with dishes in the cafeteria.	Paper plates	5 CY per week; 260 CY per year	Average of \$3 per CY, or \$780 per year	\$75 per week; \$3,900 per year	\$0.00	\$4,680
TOTAL ESTIMATED COST SAVINGS & REVENUES						

Continued on the following page

PART 3: Estimating Recycling and Waste Reduction Program Costs

Most recycling services are provided at a cost to the college/university. Therefore, these costs also should be estimated to help develop a realistic expectation of net costs of the program.

Below, identify and record estimated annual costs associated with the program. Although there is a line for additional labor, in many cases campuses are able to implement a program with no additional labor costs.

A. Estimated Annual Costs of the Recycling Program	
Additional labor	\$
Additional Energy Requirements	\$
Additional Estimated Collection Service	\$
Additional Estimated Container Rental/Maintenance	\$
Additional Space Required	\$
Education/Promotion	\$
Recordkeeping	\$
Equipment Supplies (e.g., baler wire, if required)	\$
Equipment Maintenance (if required)	\$
Other	\$
Other	\$
B. Recycling Start-up Costs (amortized annually)	
Containers	\$
Equipment (e.g., balers, compactors, if required)	\$
Signage	\$
Other	\$
Other	\$
C. Estimated Costs of Waste Reduction Activities	
Equipment	\$
Required Material/Goods	\$
Additional Electricity	\$
Additional Water	\$
Additional Labor	\$
Other	\$
Other	\$
D. Sum of All Annual Costs (Part 3 A, B and C):	\$

PART 4: Estimating Net Costs (Savings)

Estimate total net program costs (savings) by the following:

$$\begin{array}{rcl}
 \$ \underline{\hspace{2cm}} & & \$ \underline{\hspace{2cm}} \\
 \text{total estimated} & - & \text{total program costs} \\
 \text{cost savings/revenues (Part 2, C)} & & \text{(Part 3, D)} \\
 & & = \\
 & & \$ \underline{\hspace{2cm}} \\
 & & \text{estimated} \\
 & & \text{net savings}
 \end{array}$$

WORKSHEET G: Recycling Awareness Survey

1. **Rate your knowledge level of the current recycling program in place.**
 - There's a recycling program?
 - I know we have a program in place.
 - I have an average amount of knowledge.
 - I am confident in my knowledge on the program.
 - I educate others on the program.
2. **How often do you recycle?**
 - I refuse to recycle.
 - I don't go out of my way to recycle but will if in proximity of a container.
 - I recycle if I have the opportunity.
 - I will go out of my way to make sure I recycle.
 - I recycle everything.
3. **Check the following streams that you know are available in the current recycling program.**
 - Electronics
 - Glass
 - Hazardous medical
 - Metal
 - Organics
 - Paper
 - Plastic
 - Other
 - Waste mixed/commingled cans and bottles
4. **Check all of the locations where you know there are currently recycling containers available.**
 - Exits
 - Exterior of building
 - Hallways
 - Lobby/front entrance
 - Lunchrooms
 - Washrooms
 - Other
5. **Are there any ways to improve the current recycling program?**
 - Add more recycling stations.
 - Increase advertisement of the program.
 - Offer more education on the program.
 - Other (please specify).

S.C. Environmentally Preferred Purchasing Policy

STATEMENT OF POLICY

South Carolina state government seeks to further reduce the environmental and human health impacts of its operations by integrating environmental considerations into its procurement process.

South Carolina state government is committed to environmentally preferred purchasing in recognition of the need to more efficiently use natural resources, reduce waste, save money, sustain markets for materials collected in recycling programs and protect South Carolina's environment, economy and the quality of life of all its citizens.

Therefore it is the policy of the state of South Carolina to endeavor to:

- **Improve or implement green purchasing practices** that reduce waste and result in the purchase of fewer products, when practicable and cost effective, without reducing the safety or quality of the products;
- **Make purchasing decisions with the understanding and consideration of the environmental impact** and life cycle cost of a product or service during its manufacture, transport, use and end-of-life management;
- **Identify and purchase products and services** that prevent pollution, eliminate or reduce toxins, conserve energy and water, contain recycled-content material and minimize environmental impacts; and
- **Purchase from South Carolina businesses** to minimize transportation costs and emissions, when it can be done with adequate competition and without compromise of performance or quality of products or services.

This Policy applies to all South Carolina state agencies and publicly funded colleges and universities and others defined as governmental bodies per SC Code Section 11-35-310(18) (www.scstatehouse.gov/code/t11c035.php). Vendors, contractors and grantees will comply with applicable sections of this policy for products and services that are provided to the state of South Carolina. All purchases under this policy are subject to local, state or federal requirements as applicable. Nothing in this policy should be construed as requiring a state agency or publicly funded college or university to procure products that do not perform according to their intended use or reduce safety, quality, or effectiveness.

The following Standards are provided as a guide to implementing this policy. Policy effective date: October 15, 2009

STANDARDS

These standards have been adopted to assist purchasers in fulfilling their obligations of this policy. The standards listed below should not be considered a complete list. Purchasers are encouraged to go beyond these standards.

1. SOURCE REDUCTION

- 1.1 Purchase products that are durable, long lasting, reusable or refillable.
- 1.2 Purchase remanufactured products such as toner cartridges, tires, furniture, equipment and automotive parts, but without reducing safety, quality, effectiveness or the warranty that supports the original product.
- 1.3 Consider short-term and long-term costs in comparing product choices. This includes an evaluation of the total costs expected during the time the product is owned including, but not limited to, acquisition, extended warranties, operation, supplies, maintenance, and end of life management.

- 1.4 Request vendors to reduce packaging or use the minimum amount necessary for product protection.
- 1.5 Request vendors that cannot eliminate packaging to use packaging that is reusable, recyclable or able to be composted in existing recycling programs.
- 1.6 Assign high priority to products that are manufactured by companies that take financial and/or physical responsibility for collecting, recycling or, reusing as well as safely managing their products and packaging at the end of their useful life.
- 1.7 Request vendors to provide information on the manufacturer's recycling services when products are available that have established manufacturer-financed recycling programs.
- 1.8 Require that surplus or outdated electronic equipment, including but not limited to, computers, monitors, printers and copiers, be designated for reuse or recycled under the requirements of the state contract for managing electronic equipment.
- 1.9 Consider leasing Information Technology equipment (i.e. computer hardware, printers, mail machines) under the requirements of the state term contract for equipment recycling.

2. RECYCLED-CONTENT PRODUCTS

- 2.1 Apply, as a general rule, the 7.5 percent price preference for purchasing recycled-content products (S.C. Solid Waste Policy and Management Act of 1991, Section 44-96-140 www.scstatehouse.gov/code/t44c096.php). The state has a goal that of all products purchased, at least twenty-five percent (25%) will contain recycled-content materials.
- 2.2 Specify and purchase products that contain the highest percentage of post-consumer recycled content practicable, but no less than the minimum recycled-content standards established by the U.S. Environmental Protection Agency (EPA) through its Comprehensive Procurement Guidelines. (www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program).
- 2.3 Specify and purchase products compliant with the recycled product specifications listed in the State of SC Guide for Recycled Products. (www.procurement.sc.gov/files/RecycleGuide.doc).
- 2.4 Specify that all printed materials (e.g., reports, brochures, letters, forms, business cards) that are purchased or produced must be printed on recycled-content paper and contain a statement on the material that the paper contains recycled content. The statement also should indicate the percentage of post-consumer recycled content it contains.
- 2.5 Specify and purchase recycled-content transportation products such as signs, traffic cones, barricades, parking stops and delineators.
- 2.6 Specify the use of recycled, reusable or reground materials for paved construction projects.

3. ENERGY AND WATER SAVINGS

- 3.1 Purchase energy-efficient equipment with the most up-to-date, economically feasible and proven energy efficiency functions. This includes, but is not limited to, high-efficiency heating and cooling equipment, high efficiency motors and equipment controls.
- 3.2 Purchase appliances and equipment that meets or exceeds EPA's Energy Star standards and have the Energy Star label (www.energystar.gov).

- 3.3 Replace non-energy efficient lighting; including interior and exterior lighting, street lighting and traffic signal lights with energy-efficient equipment and bulbs.
- 3.4 Replace, as required by law (S.C. Energy Efficiency Act, Section 48-52-640), incandescent light bulbs with compact fluorescent bulbs when the incandescent bulb needs to be replaced.
- 3.5 Purchase water-saving products, including but not limited to, high-performance fixtures like low-flow toilets, waterless urinals, tankless water heaters, low-flow faucets and aerators as well as faucets with motion-activated sensors. When possible, purchase products receiving EPA's WaterSense designation (www.epa.gov/watersense).

4. POLLUTION PREVENTION AND TOXICS REDUCTION

- 4.1 When making a choice among comparable products, purchase products whose production and use involve fewer hazardous materials.
- 4.2 Purchase cleaning products that meet the Green Seal certification (www.greenseal.org). Require vendors to adopt green cleaning practices.
- 4.3 Require that all surfactants and detergents be biodegradable and not contain phosphates.
- 4.4 Purchase building products, such as paint, carpet, adhesives, furniture and casework, with the lowest amount of volatile organic compounds (VOCs), highest recycled content, and low or no urea formaldehyde.
- 4.5 Purchase paper products that are unbleached or that are processed without chlorine or chlorine derivatives.
- 4.6 Purchase soy-based ink for printing. Include the use of soy-based ink in printing contracts.
- 4.7 Do not purchase products that use polyvinyl chloride (PVC) such as, but not limited to, office binders, furniture, flooring and medical supplies.
- 4.8 Purchase rechargeable instead of single use batteries.
- 4.9 Specify that desktop computers, notebooks and monitors purchased or leased meet, at a minimum, the bronze standard of the Electronic Product Environmental Assessment Tool (EPEAT) environmental criteria (www.epeat.net).
- 4.10 Purchase replacement vehicles as required by S.C. Code Section 1-11-310 (www.scstatehouse.gov/code/t1c011.php), that are less-polluting alternatives and cleaner operating models such as hybrid, bio-diesel, hydrogen, fuel cell, or flex-fuel vehicles and encourage and track the use of alternative fuels.
- 4.11 As a practice in Integrated Pest Management, purchase chemical controls only as a last resort. Purchase and use pesticides only after monitoring indicates they are needed and treatments are designed with the goal of removing only the target organism.

5. GREEN BUILDING CONSTRUCTION AND LEASING

- 5.1 Follow Green Building Practices for design, construction, and operation of all new building projects and renovations. Specific building projects identified in the S.C. Energy Independence and Sustainable Construction Act of 2007, Section 48-52-830, (www.scstatehouse.gov/code/t48c052.php) shall be constructed in accordance with either the U.S. Green Building Council (USGBC, <https://new.usgbc.org/>) LEED standard or the Green Globes Rating System (www.greenglobes.com).

- 5.2 When building and leasing, consider the use of on-site renewable energy such as solar, wind, geothermal and biomass to reduce impacts of fossil fuel use.
- 5.3 Consider deconstruction and re-use of materials or purchase previously used or salvaged building materials to reduce waste and the need for virgin materials.
- 5.4 Reduce the depletion of finite raw materials by using rapidly renewable materials such as bamboo, wool, cotton, linoleum and cork.
- 5.5 Maximize the use of natural lighting in buildings to avoid the use of artificial lighting.
- 5.6 When building and leasing, develop a plan for measurement of building water and energy consumption to provide ongoing accountability of actual usage.
- 5.7 When leasing office space, negotiate with leaser for renovations to install high efficiency lighting, lighting and other equipment controls and water sensors. Then, seek reduction in utility allowance.
- 5.8 Lease buildings with provided recycling services; energy efficient and water saving fixtures; green cleaning practices; and that use green landscaping techniques.
- 5.9 When renovating space, plan for flexibility and future change by using easily moved walls, outlets, etc.

6. GREEN LANDSCAPING

- 6.1 Purchase environmentally friendly landscape services that includes design, construction, renovation and maintenance. These services may include grasscycling, composting and the reduction of hazardous products.
- 6.2 Purchase recycled-content materials when constructing hardscape and landscape structures.
- 6.3 Reduce water used for irrigation by purchasing plants that are native to the area where they are planted and drought-tolerant plants that require minimal or no watering once established.
- 6.4 Reduce water pollution and heat-island effect by reducing the amount of impervious surfaces in the landscape. Permeable substitutes such as pervious concrete or pavers are preferred for walkways, patios, driveways and low-volume traffic areas.
- 6.5 Reduce light pollution by only lighting areas to the level required for safety and comfort.

7. GREEN TRAVEL AND MEETINGS

- 7.1 Consider green hotels when making reservations.
- 7.2 Purchase environmentally friendly conference and workshop services including meeting facilities and catering.
- 7.3 Host and attend Webinars and teleconferencing in place of workshops and conferences.
- 7.4 When using a State car or being reimbursed for mileage for travel, consider carpooling to help reduce gas usage and emissions.

8. END-OF-LIFE MANAGEMENT

- 8.1 Require that all surplus or outdated equipment/facilities/materials be identified as surplus and, under S. C. Regulation 19-445.2150, be considered to have remaining useful life and available for disposal.
- 8.2 Focus on in-state reuse by State agencies, towns, municipalities and other state supported agencies to avoid

duplicate procurement and encourage reuse of resources throughout every level of state government.

- 8.3 Preplan projects with one-time contracting to remove items considered surplus property and deliver to other state agencies or sell to the general public.
- 8.4 Consider buying material that at the end-of-life can be reutilized as-is or recycled, such as aluminum signs, metal fencing, and metal shelving.

9. IMPLEMENTATION

- 9.1 The S.C. Budget and Control Board's Materials Management Office (MMO) will oversee the statewide implementation of this policy.
- 9.2 MMO will, as required by law (S.C. Solid Waste Policy and Management Act of 1991, Section 44-96-140, (www.scstatehouse.gov/code/t44c096.php), maintain and update annually a list of products with recycled-content specifications (S.C. Recycled Products Guide). The S.C. Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling will assist MMO as needed with this requirement.
- 9.3 MMO will establish a Green Purchasing Workgroup of no less than seven members to be selected from state agencies as well as colleges and universities that will meet at least quarterly. The state's Chief Procurement Officer will chair the workgroup. The mission of the workgroup will be to enhance and facilitate the coordination and implementation of this policy. Specifically, the workgroup will:
 - 9.3.1 Identify immediate priorities, establish a process for identifying additional priorities and set deadlines for implementation;
 - 9.3.2 Develop and implement an education and outreach program on this policy that may include workshops, conferences, training, media events and electronic newsletters.
 - 9.3.3 Research and recommend recycled-content products for consideration on state contracts;
 - 9.3.4 Review, research and make recommendations for updates to the S.C. Recycled Products Guide;
 - 9.3.5 Develop, implement and assist state agencies and colleges and universities in tracking their green purchasing progress; and
 - 9.3.6 Review and revise (if necessary) the standards of this policy on at least an annual basis.
- 9.4 All state agencies, including colleges and universities, are required to provide a Green Purchasing Initiative" contact to MMO to assist with the implementation of this policy.
- 9.5 All state agencies, including colleges and universities, are required by law (S.C. Solid Waste Policy and Management Act of 1991, Section 44-96-140, (www.scstatehouse.gov/code/t44c096.php) to report their recycled-content purchases annually by September 15th to DHEC's Office of Solid Waste Reduction and Recycling (Office). The Office will then compile the information that is reported and publish an annual report on the state's overall progress.
- 9.6 Upon request, buyers making the selection from competitive bids should be able to provide justification for product choices that do not meet the environmentally preferable purchasing criteria in this policy. Suggested revised language: Purchasers should be able to provide justification for product choices that

do not meet the environmentally preferable purchasing criteria in this policy.

10. DEFINITIONS

- 10.1 BIODEGRADABLE: Capable of being broken down by microorganisms into simple, stable compounds such as carbon dioxide and water.
- 10.2 COMPOST: The product resulting from the decomposition of organic materials such as yard trimmings and food scraps.
- 10.3 COMPOSTING: The conversion of organic material to compost by microorganisms. Composting is an effective solid waste management method for reducing the organic portion of garbage including yard trimmings, leaves and food scraps.
- 10.4 COMPREHENSIVE PROCUREMENT GUIDELINES (CPG): The guidelines established by the U.S. Environmental Protection Agency (EPA) CPG program that promotes the use of materials recovered from solid waste. One key component of the program is EPA's list of designated products with recycled-content recommendations. Products are grouped into eight categories: construction; landscaping; non-paper office; paper and paper products; park and recreation; transportation, vehicles and miscellaneous.
- 10.5 ELECTRONIC PRODUCT ENVIRONMENTAL ASSESSMENT TOOL (EPEAT): A procurement tool to help institutional purchasers in the public and private sectors evaluate, compare and select desktop computers, notebooks and monitors based on their environmental attributes.
- 10.6 ENERGY STAR: EPA's energy efficiency product labeling program.
- 10.7 ENERGY EFFICIENT: A product that is in the upper 25 percent of energy efficiency for all similar products, or that is at least 10 percent more efficient than the minimum level that meets Federal standards.
- 10.8 ENVIRONMENTAL PERFORMANCE: Considerations include the use of renewable resources, improved energy and water efficiency, the reduction of air contaminants and greenhouse gas emissions, waste reduction, increased reuse and recycling, and the reduction of hazardous waste and toxic pollutants.
- 10.9 ENVIRONMENTALLY PREFERRED: Products and services that have a lesser or reduced effect on human health and the environment over the life cycle of the products and services when compared with competing products or services that serve the same purpose. This comparison applies to the acquisition of raw materials, manufacturing, packaging, distribution, use, reuse, operation, maintenance and end-of-life management.
- 10.10 GREEN BUILDING PRACTICES: A whole-systems approach to the design, construction, and operation of buildings and structures that help mitigate the environmental, economic, and social impacts of construction, demolition, and renovation. Green Building Practices such as those described in the LEEDTM Rating System, recognize the relationship between natural and built environments and seeks to minimize the use of energy, water, and other natural resources and provide a healthy productive environment.
- 10.11 GREEN GLOBES: Green Globes is a Green Building Rating System for new and existing buildings used in Canada and the USA. In the USA, Green Globes is owned and operated by the Green Building Initiative (GBI).
- 10.12 GREEN SEAL: An independent, non-profit environmental labeling organization. Green Seal standards for products and services meet the U.S. EPA's criteria for third-party certifiers. The Green Seal is a registered certification mark that may appear only on certified products

- 10.13 **HARDSCAPE:** Part of a building's grounds made with hard materials such as patios, retaining walls, and walkways.
- 10.14 **HEAT-ISLAND EFFECT:** Warmer temperatures in urban areas compared to adjacent rural area as a result of solar energy retention on constructed surfaces such as streets, sidewalks, parking lots and buildings.
- 10.15 **IMPERVIOUS:** Surfaces that do not permit the penetration or passage of liquids.
- 10.16 **INTEGRATED PEST MANAGEMENT (IPM):** An ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.
- 10.17 **LEED:** Leadership in Energy and Environmental Design is a Green Building Rating System established by the U.S. Green Building Council and designed for rating new and existing commercial and residential buildings and community developments.
- 10.18 **LIFE-CYCLE COSTS ANALYSIS:** The study of the costs associated with a product throughout its life cycle - from acquisition to its end-of-life management.
- 10.19 **PERMEABLE:** The permitting of liquids to pass through.
- 10.20 **POST-CONSUMER MATERIAL:** A finished material which would normally be disposed of as a solid waste, having reached its intended end-use and completed its life cycle as a consumer item, and does not include manufacturing or converting wastes.
- 10.21 **PRE-CONSUMER MATERIAL:** Material or by-products generated during or after manufacture of a product is completed but before the product reaches the end-use consumer. Pre-consumer material does not include mill and manufacturing trim, scrap, or broke which is generated at a manufacturing site and commonly reused on-site in the same or another manufacturing process.
- 10.22 **PRODUCER RESPONSIBILITY:** An environmental strategy in which producers assume financial and/or physical responsibility for the management of post-consumer products so that those who produce and use those products bear the costs of recycling and proper disposal.
- 10.23 **RECOVERED MATERIAL:** Fragments of products or finished products of a manufacturing process, which has converted a resource into a commodity of real economic value, and includes pre-consumer and post-consumer material but does not include excess resources of the manufacturing process.
- 10.24 **RECYCLED CONTENT:** The percentage of recovered material, including pre-consumer and post-consumer materials, in a product that otherwise would have been discarded. Recovered material that would have been discarded that is used in a product. Recycled content material can be pre-consumer or post-consumer.
- 10.25 **REMANUFACTURED PRODUCT:** Any product diverted from the supply of discarded materials by refurbishing and marketing said product without substantial change to its original form.
- 10.26 **REUSED PRODUCT:** Any product designed to be used many times for the same or other purposes without additional processing except for specific requirements such as cleaning, painting or minor repairs.
- 10.27 **SOURCE REDUCTION:** Products that result in a net reduction in the generation of waste compared to their previous or alternate version and includes durable, reusable and remanufactured products; products with no, or reduced, toxic constituents; and products marketed with no, or reduced, packaging.
- 10.38 **S.C. RECYCLED PRODUCTS GUIDE:** A listing of products with recycled-content specifications.
- 10.39 **SURFACTANT:** An agent that, when dissolved in water, works to loosen dirt to allow cleaning agents better removal of dirt from surfaces.
- 10.40 **SUSTAINABLE:** The needs of the present are met without compromising the ability of future generations to meet their own needs.
- 10.41 **U.S. DEPARTMENT OF ENERGY (DOE):** A federal agency that promotes energy conservation.
- 10.42 **U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA):** A federal agency that leads the nation's environmental science, research, education and assessment efforts to protect human health and the environment.
- 10.43 **U.S. EPA GUIDELINES:** The Comprehensive Procurement Guidelines established by the U.S. Environmental Protection Agency for federal agency purchases as of May 2002 and any subsequent versions adopted.
- 10.44 **WATER-SAVING PRODUCTS:** Products that are in the upper 25 percent of water conservation for all similar products, or at least 10 percent more water conserving than the minimum level that meets the Federal standards.
- 10.45 **WATERSENSE:** A partnership program sponsored by the U.S. Environmental Protection Agency makes it easy for Americans to save water and protect the environment. Look for the WaterSense label to choose quality, water-efficient products.
- 11. SOURCES**
- 11.1 City of Oakland, Environmentally Preferable Purchasing Policy
- 11.2 City of Seattle, Sustainable Purchasing Policy
- 11.3 Clemson University, Sustainable Procurement Policy
- 11.4 King County (Washington), Recycled Product Procurement Policy
- 11.5 Rutgers, The State University of New Jersey, Green Purchasing Guidelines Policy



PRINTED ON RECYCLED PAPER
OR-1311 11/18