Organics Recovery Toolkit for Universities and Colleges

National Sustainable Materials Management (SMM) Program

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CHANGING HOW WE THINK ABOUT OUR RESOURCES FOR A BETTER TOMORROW

EPA United States Environmental Protection Agency

www.epa.gov/smm

ORGANICS RECOVERY PROGRAM DEVELOPMENT TOOL FOR COLLEGES AND UNIVERSITIES

UNIVERSITY OF LOUISVILLE
CENTER FOR ENVIRONMENTAL POLICY & MANAGEMENT

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EPA United States Environmental Protection Agency

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Project Summary

- EPA Region 4, partnered with the University of Louisville Center of Environmental Policy and Management EFC4 (CEPM/EFC4) to develop an organics recovery toolkit for colleges and universities. This Advisory document will provide colleges and universities technical guidance on policies, technical and economic feasibility, and implementation issues relevant to developing a sustainable management protocol for organics.

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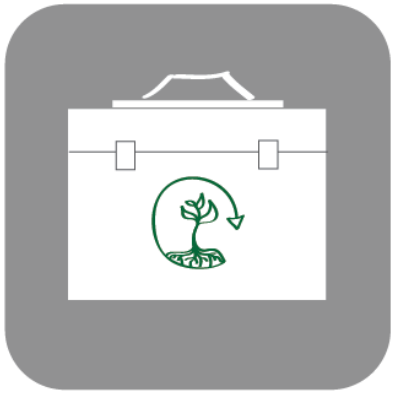
Toolkit Users

Develop toolkit that applies to post-secondary institutions with:

- Large and small enrollment
- Organics recovery programming of various phases of development, whether conceptual or upon implementation.



Guidance Areas

- INSTITUTIONAL PARTNERS
- FUNDING MECHANISMS
- OPERATIONAL MODEL
- STUDENT INVOLVEMENT
- ACADEMIC PROGRAMMING
- COMMUNITY PARTNERSHIPS

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Questions to be Addressed in the Toolkit

1. What particular approaches to sustainable organics management are appropriate for colleges and universities?

2. What technological options are available to colleges and universities?

3. What are the space requirements needed to implement any of these approaches?

Questions to be Addressed in the Toolkit

4. What level of capital investment is needed to implement any of these approaches?

5. Are there state/county/municipal requirements involved in implementing these approaches.

6. What techniques can be applied to promote and organize student involvement, academic programming, and community partnerships?

INSTITUTIONAL PARTNERS

-Who should be included in organics recovery decision-making?

- ☐ Administration
- ☐ Dining Services
- ☐ External Stakeholders (Engineers, Technical Advisors, Planners, City/County Waste Management/Public Works, State Regulatory Agency, Neighborhood Partners, other local/regional Educational Institutions)
- ☐ Facilities Management (Grounds Department, Waste Reduction, Recycling)
- ☐ Faculty/Staff/Office Management
- ☐ Garden/Farm Manager
- ☐ Residence Life
- ☐ Student groups
- ☐ Sustainability Program

-How should decision making and coordination occur?

- ☐ Existing Sustainability Committee/Council
- ☐ Special Composting Subcommittee/Taskforce

-How are staff and volunteer responsibilities established?

Identify funding capacity and dedicated individuals to fulfill:

- ☐ Part-time/full-time paid staff assignments
- ☐ Paid/volunteer student work assignments
- ☐ Committed research faculty

OPERATIONAL MODEL

-What type of organics recovery method?

- Source reduction
- Feed hungry people
- Feed animals
- Industrial uses
- Composting

-What is the operational budget?

-What are the land/space requirements?

-What type of organics does this method accept?

-How much organic waste can this method accept?

-Which schools that are conducting this method?

-What technology providers are offering products and service?

-What are the roles and responsibilities for this method?

-What additional tools/equipment/inputs will be needed for this method?

FUNDING MECHANISMS

-What are the financing approaches to consider?

Dedicating an internal operational budget (facilities, dining services, sustainability funds)

Rely on donated time/equipment/work (students, faculty, staff)

Apply for external funding opportunities (state or local grants, private foundations)

-What type of labor will be used?

Part-time/full-time paid staff assignments

Paid/volunteer student work assignments

Research faculty/staff

-What costs should be considered?

Preliminary studies (waste characterization study/audit, feasibility study, cost-benefit analysis, planning and design)

Capital costs (site preparation, construction/installation of facility, tools and equipment)

Operational costs (fuel for transportation of feedstock, labor, electricity, hauling contracts)

-What savings should be considered?

Savings from reduction in landfill fees

Savings from reduction in compost purchase costs

Changes in greenhouse gas emissions

In-Vessel Composting

Types	Enclosed aerated static piles, agitated bed vessels, rotating drums
Sub-types	Continuous, batch, aerated, anaerobic
Land/Space Requirements	Container space requirements can depend upon the size of in-vessel unit
Type of Feedstock	Soil, "bedding" (shredded paper, cardboard, woodchips, etc.), water, food waste, plant waste, manure, animal mortality
Feedstock Capacity	Feedstocks amount will depend upon the capacity of the in-vessel unit
Notable Colleges/Universities	Guilford College Clemson University Furman University Warren Wilson College Davidson College
Technology Providers	X-ACT, Environmental Products and Technologies Corporations, ECS-Engineered Compost Systems, BDP Industries, Green Mountain Technologies, BIOMRF Technologies, Bactee Systems, Nath Sustainable Solutions, BW Organics.
Available Products	X-ACT System's Rotating Drum, EarthTub, The Rocket.
Cost Considerations	Vessel unit, carbon source, maintenance fees, labor fees, pH meter, water.
Roles/Responsibilities	Program Coordinator, Student Coordinator (if student labor is used), Recycler/Hauler (to transport feedstock), Recycler (turn and add feedstock, harvest castings), grounds/landscaping (apply castings to grounds)
Essential Tools/Equipment/Inputs	Vessel unit, carbon source, time, wood/concrete blocks/enclosed material (if making homemade in-vessel unit), labor.
Suuplemental Tools/Equipment/Inputs	Hand tools for manual turning (if unit does not turn), moisture detectors, miscellaneous materials (if making homemade in-vessel unit).
Benefits	Requires less space, less labor, relatively simplistic operations, faster composting times, control odors, control pests, control oxygen level, control temperature, control moisture level, ideal for numerous number of feedstocks, works well for both small and large scale schools, can be used with other types of methods, easiest way to get started, no short of options to consider
Challenges	Capital costs, maintenance costs, complex units may require skill to operate, food waste diversion is confined to in-vessel capacity, unit can break/cause problems
Common Terms	Auger, enclosed aerated static piles, agitated bed vessels, rotating drums, continuous, batch, aerated, aerobic, anaerobic, bin, tumbler, rolling drums, turner
Educational Resources	Guide to Selecting an In-Vessel Composting System, The Science Behind In-Vessel Composting

University of Tennessee, Knoxville, Knoxville, TN

Enrollment Category: 20,000 and above

The University of Tennessee, Knoxville (UT) began composting informally in 2001. Over time, the Recycling Coordinator partnered with the grounds department and gathered University support for a more formalized composting operation. First, they began incrementally adding other feedstock, starting with coffee grounds (2005), then as the support for expansion was considered, a composting site was identified on-campus in a location away from populated areas. Once the site was established, a large scale windrow composting program began operation in 2010. Additional feedstock was added such as food scraps from dining halls, animal bedding, manure, and recently paper towels. An average of 10,000 lbs. of food waste and 14,000 lbs of manure and bedding is collected per week.

With the UT campus located a far distance from the nearest off-site commercial composting facility and with limited State composting program incentives and regulatory framework, on-site composting just made sense. Funding is primarily through operational budgets; other funding is from UT's Student Environmental Initiatives Fund "Green Fee", which has purchased specialized equipment, such as a Bobcat skid steer loader used to cover the food and move materials. The composting budget also pays student interns who help by collecting and hauling food waste from a total of 25 locations on campus. Other student participation occurs through volunteerism and coursework, such as the Organic Crop Production Program of the Institute of Agriculture.

There are three general rules for implementing a campus composting operation. First, with windrow composting in open spaces, stormwater management and drainage planning is needed *before* constructing the composting facility. Second, manage the cost-benefit of the operations by calculating the cost savings of diverting organics from local landfills. Learn how this fits into a school's overall sustainability and waste reduction goals. And third, as UT has proven, when the right partnerships are fostered, a school can incrementally make its way toward reaching its composting diversion goals.

Profile Example

We Desire to have your feedback
Would you like to participate?

Contact Me

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