

Waste Reduction Strategic Plan

Working Toward a Zero Waste Campus



Mess on the Mall- Event to promote awareness of consumption and recycling initiatives on campus



Office of Sustainability
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Submitted to:

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NOTE:

This document contains language of a technical nature relating to the measurement of greenhouse gas emissions on a college campus. A basic understanding of these concepts is assumed. A glossary in Section IX provides a few brief definitions.



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I. Executive Summary

Scope of Report

Appalachian State University is committed to becoming a zero waste campus through a goal of 90% diversion by 2022. Using zero waste as a guiding principle, this diversion rate can be restated as a 90% diversion of municipal solid waste (MSW) from the landfill. Over the next 10 years, Appalachian will work toward zero waste through several initiatives outlined in the following strategic plan. Zero waste, for the purpose of this document, seeks to rethink the way resources and materials flow through the university by taking a whole system approach. This approach will strive to reduce overall consumption, return material goods for reuse, compost all applicable organic matter to promote new growth, and then recycle goods and materials at the end of their usage lifespan.

Reducing the university's consumption is crucial to begin any creation of a sustainable waste cycle. If Appalachian can begin to eliminate waste in the first place, the university is on the proper path toward a zero waste campus. Reduce being the most important of the 3 R's: reduce, reuse, recycle, it is critical that the university begins to embrace waste reduction, and considers this commitment in all decisions made.

The Waste Reduction Strategic Plan proposes the framework for achieving the ambitious zero waste goal directed by The University of North Carolina (UNC) System Sustainability- UNC Policy Manual 600.6.1. Overall, the university's execution of these goals will need to be consistent with the mission of the university and deemed to be cost effective. Specific initiatives have been identified for achieving success throughout the 10 year process. Each initiative also has indicators to gauge progress and provide guidance for future action plans or program expansion. This document is meant to be flexible and reviewed on a periodic basis as resources, technology and opportunities evolve on the Appalachian State University campus.

To achieve zero waste will require dedication. The campus community must view this as an educational opportunity where we are simultaneously teaching and learning from one another. The complete set of answers to this complex problem is not known and can only be found through an interconnected and collaborative effort. This will challenge everyone to rethink their usual habits in accordance with an effort that is based on a respect for the importance of sustainability, the commitment to zero waste, and each other. Administration, faculty, staff, and students must be prepared to both lead by example and to be respectful users of our campus infrastructure, with zero waste being the critical driver.

For strategic planning purposes, the next 10 years has been divided into temporal periods as described below:

Period	Description	Foci
2012-2014	The Now	Awareness, Operational and Organizational Readiness
2015-2018	The Foreseeable Tomorrow	Infrastructure Upgrades, Cultural/Behavioral Shift
2019-2022	The Sustainable Future	Transformation, Paradigm Shift

Working toward zero waste is important to the university because consumption and waste management practices have a major impact on the health of the planet, as well as its people. Appalachian State University handles over 3200 tons of waste annually whether through reuse, recycling, composting, or

landfilling. Changing consumption behaviors and purchasing habits to reduce this tonnage, and recover waste as a resource through sustainable management habits is the responsible thing to do when considering limited natural resources, expanding population growth, and economic potential. In addition, it assists with the education of the campus community around responsible purchasing habits, consumption behaviors, and responsible living for a sustainable future.

Stakeholders

The Office of Sustainability (OS), in conjunction with campus services, has led in the coordination and creation of this planning document. Many elements of the university have played significant roles in its preparation. These groups include: university administrators, faculty members, staff members, and students. Also engaged in this process will be the University Sustainability Council, which was founded in 2008. A Purchasing and Waste Subcommittee has been created that will manage and track the progress of the movement towards zero waste.

Listed below are some of the many persons who will play a part in this effort:

Dr. Kenneth Peacock	Chancellor
Greg Lovins	Vice Chancellor Business Affairs
Carol Acquesta	Director of Planning, Design, and Construction
Jim Bryan	Landscape Services Superintendent
Debbie Carriere	Building Services Manager
Todd Cherry	Economics Faculty, Purchasing and Waste Subcommittee
Gerald Combs	Recycling Operations Manager
Jake Cox	SGA Director of International and Environmental Affairs, Purchasing and Waste Subcommittee
Tom Van Guilder	Director of Technology Support Services, Purchasing and Waste Subcommittee
Dr. Tom Kane	University Housing Director
Art Kessler	Food Services Manager
Jennifer Maxwell	Resource Conservation Specialist, Purchasing and Waste Subcommittee
Lindsay Miller	Sustainability Support
Ged Moody	University Sustainability Director
Seth Norris	Director of Environmental Health Safety & Emergency Management, Purchasing and Waste Subcommittee
Mike O'Connor	Physical Plant Director
Dwayne Odvody	Director of Materials Management, Purchasing and Waste Subcommittee
Karl "Casey" Pond	MBA Student, Sustainable Business, Class of 2011
Dave Robertson	Director of Student Programs and the Plemmons Student Union, Purchasing and Waste Subcommittee
Crystal Simmons	Sustainability Specialist
Jeff Talbot	Purchasing Manager, Physical Plant
Dr. Greg Taylor	Director of Campus Services Division, Purchasing and Waste Subcommittee
Linda Toth	Sustainability Graduate Assistant, Class of 2013

II. Introduction

Strategic Driver of Zero Waste

Appalachian's Sustainability Mission, Vision, and Values are in direct support of the zero waste initiative. This section features the text of this statement adopted in 2010.

Sustainability Mission Statement

Appalachian State University leads in creating a world where environmental, societal, and economic qualities exist in balance to meet the resource needs of today and of future generations. Our community of students, faculty and staff continually advance our understanding, capabilities and practices in this vital journey. As an institution of higher learning, we lead by example, inspiring new generations prepared to share this knowledge, ingenuity and passion.

Our Sustainability Vision

- Engage faculty, students and staff in ongoing dialogue, inquiry, and discovery of more sustainable practices through curriculum, degree programs, and scholarly research.
- Empower students across the curriculum with awareness in sustainability issues and a capacity to contribute to the construction of sustainable societies.
- Integrate sustainable practices into all aspects of university planning and operations, focusing both on the current and future implications.
- Design, build and operate a campus environment that minimizes its ecological footprint, contributing to the goal of climate neutrality.
- Create new paradigms for energy, transportation, water, waste and food systems that contribute to best practices in higher education.
- Participate in research initiatives and outreach activities that educate our communities, nourish our natural ecosystems, and enrich our cultural experiences.
- Embrace health, diversity, tolerance, and human rights as principles by which policy and process are designed.

Sustainability Essential Character

Appalachian has a decades-long commitment to sustainability, offering multiple degree programs and engaging our community through innovative initiatives. We honor this history and boldly move forward, inspired by our unique mountain setting and with a genuine respect for the natural environment. We recognize that sustainability is a journey, and “**sustain Appalachian**” is our commitment to advance our knowledge, to demonstrate innovative practices, and to lead by example.

Core Sustainability Values

- Focused on our roles as educators and researchers, instilling the knowledge and values of sustainability into our entire community.
- Understand that decisions throughout the university have sustainability implications which must be considered and addressed.
- Realize that sustainability must focus on interrelated environmental, societal, and economic issues and resources at both the local and global levels.

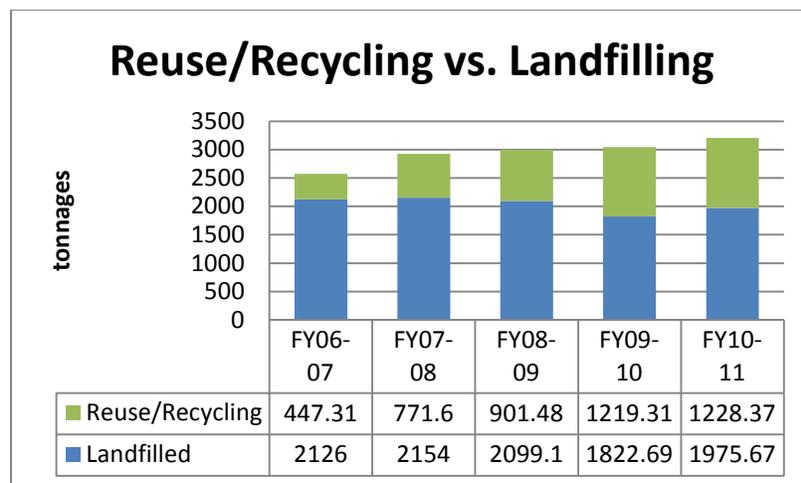
- Open to continually educate ourselves on the principles and possibilities of sustainability and willing to pursue innovative solutions.
- Committed to transparent reporting of our sustainability goals, initiatives and progress to the Appalachian community and beyond.
- Respect the planet's natural environment and our unique mountain setting, embracing our interconnectedness with these ecosystems.

III. Current Waste Diversion Program

Many of the steps and initiatives required and associated with zero waste are already underway on Appalachian’s campus. Appalachian State University has made great strides in achieving a 40% diversion rate through the work of the Waste Reduction and Recycling program. As part of a commitment to zero waste, the goal of this document is to enhance partnerships with the campus community to promote sustainable resource management practices and to conserve the planet’s natural resources. Appalachian intends to promote a steady increase in the overall waste diversion rate while further educating the campus community and public on zero waste initiatives.

Waste by the numbers

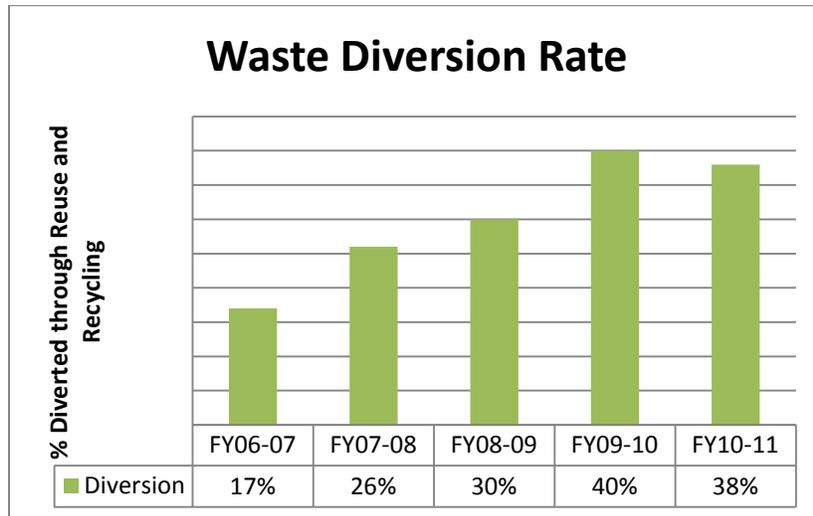
The graphs below depict in greater detail what Appalachian has reported for the last five years in terms of the diversion rates and quantities for various waste stream classifications. It is from these baseline positions that Appalachian will develop more robust dialogue around strategies to reach a zero waste goal.



Graph 3.1

As outlined in Graph 3.1, there has been a steady increase in the amount of waste captured for reuse and recycling. Over the past six years, the university has been able to divert more materials from the landfill. Through program expansion and development, Appalachian has been able to increase the tonnages of reuse/recycling.

As evident in Graph 3.1, there is still an increase in the tonnage of waste generated overall. Population growth can contribute to some of this growth, but with careful consideration of the waste stream, the total waste generated can be reduced.

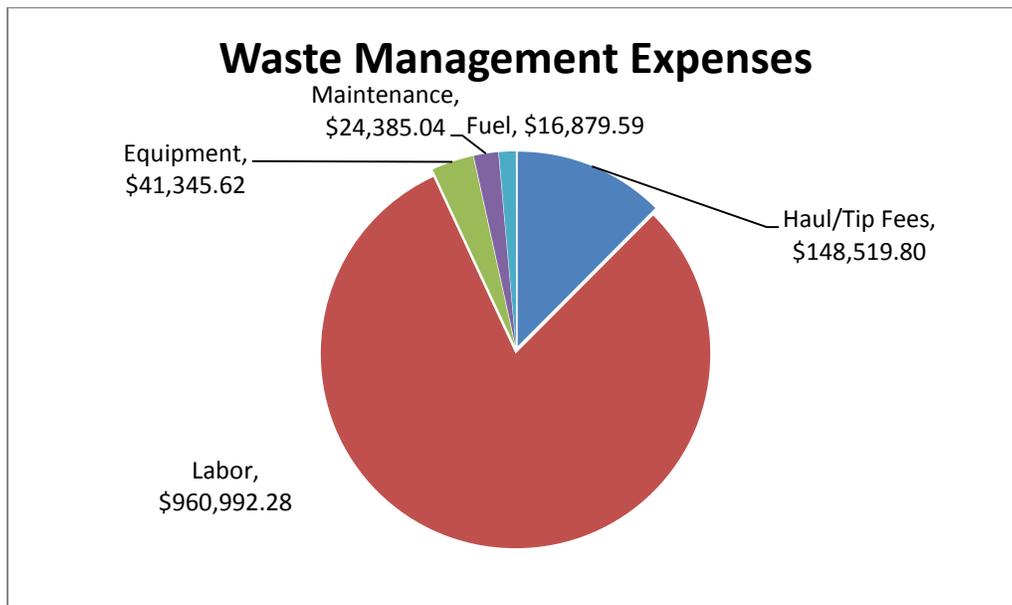


Graph 3.2

As outlined in Graph 3.2, Appalachian has been able to increase the waste diversion rate from 17% in FY 2007 to 40% in FY 2010. This growth can be attributed to program updates, new program development, better tracking, and program successes. In FY 2011, there was a decrease in the diversion rate by 2%. This is due to the fact that food waste collection for composting had to be put on hold during the construction of our new state of the art compost facility. The university was unable to obtain permitting at an alternate location while construction of new facility took place, so all organics had to be landfilled during this period.

Cost of Waste Management

The handling of municipal solid waste (MSW) at Appalachian State University is very expensive. In FY 2011, it costs the university approximately \$1.2 million dollars to manage and dispose of the MSW generated on campus. As depicted in graph 3.3, these costs include labor, haul and tip fees, equipment, maintenance, and fuel charges for the management of both trash and recycling combined.



Graph 3.3

Recycling does provide some avoided costs due to the tipping fee associated with MSW being hauled to the landfill. It costs us \$49/ton tipping fee to dispose of trash, while there is no tipping fee for recycling disposal. In FY2011, Appalachian spent over \$96,800 in tipping fees alone for our MSW.

Recycling also has the potential to generate a revenue stream. In FY 2011, \$7,187 was captured in revenues on scrap metal, cardboard, and print cartridges. Continuing down the road to zero waste, the university will continue to evaluate the recycling management system to capture revenues possible through forecasting, budgeting, and contracting procedures.

If Appalachian can identify ways to reduce consumption as a campus community, the university can begin to decrease these costs, display savings to the university, and potentially generate additional revenue on our recycling streams.

Program Successes

Recycling Program Update and Expansion

In 2006, aggressive efforts to update and expand the waste reduction and recycling program across campus began. The development of a recycling logo and webpage gave identity to the program as well as increased education and outreach opportunities. New containers were purchased and placed across campus. New locations were identified to place these containers as well. New stickers were designed with the new logo and these were added to the containers so these recycling sites were easily identified by any campus community member.



Figure 1: Central recycling sites throughout campus



Figure 2: Paper recycling containers

Appalachian developed an education and outreach plan and allocated funding for two graduate assistant positions in the Waste Reduction and Recycling program that would focus on the education and outreach. The plan consisted of tabling at events across campus, presentations in classes and for faculty and staff regularly, waste reduction information sessions, etc.



Figure 3: Special recycling station in Plemmons Student Union- International Hallway

Collaboration between Waste Reduction and Recycling and the Greening of the Union Committee produced a location on campus for the collection of special recycling. This location is a collection point for the following: CDs, DVDs, printer cartridges, cell phones, batteries, plastic bags, CFL bulbs, and rigid plastics.

Electronics Reuse and Recycling

Through collaborative efforts, and the development of a statewide electronics recycling contract, the university has developed an aggressive electronics recycling program working with Synergy Recycling in Mayodan, NC. Through this program the university is able to successfully recycle computer equipment, televisions, and cell phones with all the accessories, as well as technotrash such as CDs and DVDs, printer cartridges, and other electronics related items.

Prior to electronics being surplus and recycled, Technology Support Services (TSS) has developed “the boneyard” for electronics reuse and recovery. The primary purpose is to reuse computers and components that meet Appalachian State University’s standards. The campus replaces substandard computers to ensure quality, while meeting user’s needs for a computer. The cost savings is substantial versus the cost of a new machine. In addition to using complete computers, they also repurpose parts from computers that are not otherwise usable. For example, if a DVD drive goes bad in an Appalachian State University owned computer, it can be replaced with the part from a working DVD drive from the boneyard at no cost. The boneyard can also reuse memory, keyboards, mice and hard drives. TSS has been committed to ensuring user’s privacy for computers taken to the boneyard. All data is securely removed from hard drives before they leave the Computer Support Center. Computers that are no longer usable from the boneyard are transferred to the Appalachian Warehouse and handled through established procedures, then recycled through the electronics recycling program.



Figure 4: Electronics Recycling Boneyard in Technology Support Services

Recycle at The Rock

The development of the football and tailgate recycling program, Recycle at The Rock, began in the 2008 football season. This program is a two-fold program that consists of the installation of bottle and can recycling containers in and around the stadium concourses and gate areas, and cardboard collection from the vendors inside the stadium. The second aspect of the program is the distribution of green recycling bags and black trash bags to all tailgaters in all tailgate lots across campus. The tailgate program is made successful through the assistance of volunteers and coordinated by student interns. Over the last four years, Appalachian has been able to successfully divert 36.87 tons of recycling from the landfill through the Recycle at The Rock program.



Figure 5: Recycle at The Rock volunteer hub- Stadium Drive next to Yosef Statue



Figure 6: Recycling collection from tailgate areas and stadium recycling containers during Recycle at The Rock

Composting Program

Appalachian is home to one of the most successful and largest on-campus composting operations in the southeast. The successful compost program was started as a sustainable development student initiative in spring 1999, and began as a small static demonstration pile. The first year of operation, approximately 18 tons of food waste and coffee grounds were collected for composting. In spring 2000, several Sustainable Resource Management students in the Appropriate Technology department decided to take this program on as a semester project adding aeration to the operation, growing the program, and working with NC Department of Environment and Natural Resources to permit the facility as a type III facility. In 2000-2006, the university averaged around 25 tons of food waste collected per year. However, the tonnage grew to over 100 tons of food waste collected annually, maxing out our current facility and outgrowing the current space.



Figure 7: Newly constructed compost facility next to biology greenhouse off of State Farm Rd.

In 2010, the decision was made and funds were allocated to construct a new state of the art, cutting edge facility, in partnership with Advanced Composting Technologies of Candler, NC. Historically, Advanced Composting Technologies had been constructing facilities for the purpose of animal mortality composting only. Appalachian and Advanced Composting have partnered to showcase their very first food waste composting facility. The old system was antiquated and did not meet the permit requirements set by NC Department of Environment and Natural Resources. If the new facility had not been built, the composting permit would not have been renewed. Opening in October 2011, the new facility allows for expansion (up to 275 tons annually) so more food waste collection sites can be implemented. It also enables the beginning of post-consumer food waste composting to further improve the waste diversion rate. The new facility will broaden the scope of research opportunities for students, which include hands on learning opportunities. The facility exemplifies the possibilities and positive outcome of collaborative effort among divisions across campus- Physical Plant, Food Services, New River Light and Power, Design and Construction, Office of Sustainability, Sustainable Development, Technology Department, Biology, and beyond. There is much to learn and benefit from this new tool.

Goods Exchange (Swap) Events

Appalachian has hosted several swaps to celebrate America Recycles Day and Earth Day. A swap encourages students, faculty, staff and community members to drop off unwanted items from home and pick up items from others in an effort to create awareness, reduce consumption, reuse items, save money and build community. County and town recycling representatives also participate in these events, so the collaborative efforts are evident and commendable.



Figure 8: Campus community members participate in swap event to celebrate America Recycles Day 2011.

The swaps collect lots of clothing, shoes, electronics, office supplies, books, movies, kitchen goods, music, outdoor gear and more. Not only do these events lend an avenue to discuss waste reduction and consumption, but leftover goods are donated to local charities so the entire community benefits from these positive waste reduction efforts.

Don't Throw It Away

Coordinated by the Appalachian and the Community Together (ACT) Program, Don't Throw It Away is designed to reduce the waste produced by students during the end-of-year move out. It also raises awareness about reusing items, and the usefulness of items that end up in landfills. Students are asked to donate items in good condition that they would normally throw away at the end of the year or that they no longer have a use for. Most any item is accepted, from shower caddies, lamps, futons, clean carpets and non-perishable food items. These items are dropped off in designated areas located on the first floor of each residence hall. Items are picked up nightly during the final exam period by volunteers. Volunteers are comprised of students, staff, and community members. Items are stored for the summer to be sold at the beginning of the fall semester at The Big Sale. The program raises funds for local organizations to further their work for the community by increasing the energy efficiency of their facilities.



Figure 9: ASU student volunteers sort through donations and separate them into different categories including school supplies, clothing, housewares, furniture, kitchen, electronics, etc so items can be sold at ACT's BIG Sale in the fall

IV. Strategic Initiatives

This document is not intended to serve as the precise stepwise plan that will ultimately lead to achieving the diversion rate goal of 90%. This document is intended to serve as a guide as progress is continued towards this monumental goal. To develop the stepwise plan will require a broader and more tactical focus on the specific tasks required to achieve zero waste. As this document is updated, it will take on a more tactical nature. The following broad initiatives have been identified in support of the commitment to working toward a zero waste campus.

Initiative #1- Conduct a Comprehensive Waste Audit

In order for Appalachian State University to effectively develop and initiate programs and policies aimed at achieving zero waste, a comprehensive waste audit must be conducted. A waste audit is a formal, structured process used to quantify the amount and types of waste being generated by an organization.

The objectives of a waste audit will be:

- To determine the composition and quantities of waste being generated
- To measure the effectiveness of the campus community's waste management and recycling habits
- To identify opportunities for improving waste management systems and strategies.

Once completed, the university will have a powerful set of baseline data from which to plan enhancements to waste minimization on campus. A waste audit is high priority as it relates to all other strategic initiatives concerned with the achievement of zero waste. The projected cost of this waste audit will be \$32,500 to \$45,000.

Key Actions

1. Obtain approval to conduct comprehensive waste audit
2. Develop audit team to assist with implementation
3. Collaborate with other campuses while developing the RFP
4. Conduct waste audit through 39 buildings across campus
5. Obtain audit report for each building
6. Obtain comprehensive consolidated report
7. Develop step-by-step reduction plan based on findings

Key Indicators

1. Comprehensive waste audit completed
2. Waste audit findings reviewed by audit team
3. Waste audit findings will be published
4. Step by step plan developed

Initiative #2- Expand Reuse and Recycling Efforts

The university will expand recycling efforts. While current programs are effective, a renewed commitment to overall recycling efforts as part of a zero waste commitment will require additional strategies to maximize the benefits. Results of a waste audit will provide information that will allow for focused improvements and help guide well informed decisions designed to improve the overall diversion rate on campus.

Key Actions

1. Expand materials collected as markets become available (ex. rigid plastics)
2. Establish more recycling locations campus-wide (ex. expand walkway recycling locations)
3. Institute more recycling opportunities at special events on campus (ex. recycle at the rock)
4. Develop forecasting, budgeting, and contracting procedures for the sale of marketable recyclables
5. Develop strategic relationships with local reuse/recycling entities
6. Engage Design and Construction in the implementation of a construction and demolition waste plan
7. Develop marketing plan and educational materials to support efforts

Key Indicators

1. New recycling streams will be collected
2. Recycling locations on campus will increase inside buildings
3. Walkway recycling locations will increase from 5 bins currently
4. Recycling containers will be available at all special events on campus
5. Revenues for the sale of recyclables will increase
6. Procedures will be in place for the collaboration with local reuse/recycling entities
7. Construction and demolition waste reduction plan will be developed and managed
8. Marketing plan and educational materials will be developed and promoted

Initiative #3- Expand Composting Efforts

The university will expand composting efforts. With the new, larger composting facility on State Farm Road on line as of October 2011, the university is now capable of composting up to 275 tons annually, which is more than double the previous capacity. In order to get the maximum benefit from this valuable asset, the university will need to develop programs to ensure as much compostable material as possible is being diverted to this location. Not only will this increase the diversion rate, but use of the compost in landscape application on campus and at the Sustainable Development teaching farm will serve to improve the overall sustainability efforts of the university.

Key Actions

1. Increase pre-consumer food waste collection through Food Services
2. Conduct research of post-consumer food waste collection at other universities and state agencies
3. Collaborate with Food Services to increase compostable product line
4. Coordinate with Food Services to begin post-consumer compost collection

5. Develop pilot programs to begin post-consumer food waste collection campus-wide
6. Develop marketing plan and educational materials to support efforts

Key Indicators

1. All pre-consumer food waste being generated on campus will be captured for composting
2. A report on post-consumer food waste collection at other universities and state agencies will be completed
3. Compostable products will be purchased by Food Services
4. Post-consumer food waste will be collected by Food Services for composting
5. Pilot programs will be in place for post-consumer food waste collection campus-wide
6. Marketing plan and educational materials will be developed and promoted

Initiative #4- Institute an Environmentally Preferable Purchasing Program

The university will institute an Environmentally Preferable Purchasing Program (EPP) as directed in The University of North Carolina (UNC) System Sustainability- UNC Policy Manual 600.6.1. EPP programs are gaining momentum in higher institutions, and are a critical piece to any waste diversion goal. Through this program, the university will be required to purchase environmentally preferable products when price and quality are comparable. While this type of purchasing program will require cost/benefit analysis in far more areas than are required without EPP standards, the outcomes will be direct and measurable. For example, if styrofoam products for which there exists no recycling alternative are replaced by compostable or recyclable products, the cost to dispose vs. the cost to recycle can be directly compared. Other areas where purchasing policies can have direct and measurable effects on waste and recycling efforts are in cleaning products, electronics, building materials, vehicle fleet, vending, paper, and appliances.

According to the Environmental Protection Agency, “environmentally preferable” means, “products or 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. This comparison applies to raw materials, manufacturing, packaging, distribution, use, reuse, operation, maintenance, and disposal.” According to the 2010 report published by the Campus Consortium for Environmental Excellence (C2E2) entitled, “2010 EMS Survey Report: Environmental Management Systems at Colleges & Universities”, of the 113 respondents, 41.4% reported already having “green” purchasing programs.

The development of an EPP work group will involve collaboration of many different stakeholders across campus. These stakeholders will be chosen from the following departments or divisions: Office of Sustainability, Purchasing, Food Services, University Housing, Physical Plant, Athletics, academic representatives, and student representatives.

Key Actions

1. Establish work group to begin program development
2. Conduct research on EPP programs at other universities and state agencies
3. Develop program specific to the needs of Appalachian State University
4. Educate campus community and enforce policies and procedures

Key Indicators

1. Work group will be developed
2. A report on EPP programs at other universities and state agencies will be completed and presented
3. EPP policies and procedures for Appalachian State University will be developed
4. Policies and procedures will be implemented and measurement metrics will be put into place

Initiative #5- Encourage Campus Engagement

The university will encourage support through education, outreach, and campus community engagement. These areas of focus are critical to achieving new diversion rate goals. The continual development of new waste reduction and diversion programs will ensure overall participation in the zero waste commitment.

Key Actions

1. Develop tracking process and mechanism to track sustainability data with regards to waste and report results to the campus community
2. Identify policies that need to be changed or developed to support the zero waste commitment
3. Develop a comprehensive education and outreach plan to engage administrators, faculty, staff, and students
4. Develop a green events plan for the campus community to include pilot zero waste events
5. Encourage the paperless office as technologies become available

Key Indicators

1. Better tracking and reporting mechanisms will be in place
2. Policies will be developed or changed to support the zero waste commitment
3. Campus community will be actively engaged and involved in zero waste efforts
4. Green events plan will be developed and implemented campus-wide
5. Paperless office will continually be accomplished

V. The Role of Education and Engagement

Appalachian continues to build a sustainable community in which all community members are educated in these principles. These sustainable practices also extend outside the campus walls via outreach efforts where sustainable practices are communicated. Numerous workshops are offered annually on topics ranging from sustainable development to renewable energy to green entrepreneurship.

Appalachian's students blend into the community and are leaders in the local/regional/national sustainability movement. When the students are educated, the university influences the future leaders of tomorrow. Appalachian's faculty and staff serve with many local community service agencies, are frequent speakers, and successful green business persons. The website, www.sustain.appstate.edu, is a clearinghouse for green events, resources and stories from throughout our region. The goal is not only to educate the university community, but our entire community as well.

Other University Examples of Engagement

Illustrative of the types of efforts and initiatives that will solidify the campus commitment to zero waste are programs that can be seen at other institutions. For example, in 2008, University of North Carolina at Chapel Hill piloted reusable plastic clamshell takeout containers at the dining halls. Interested students paid a deposit for the container and then exchanged their used container for a clean one. In fall 2009, each student enrolled in a meal plan received a free reusable container. This program was sponsored by a partnership between Dining Services, the Sustainability Office, and the Office of Waste Reduction and Recycling. This will virtually eliminate the use of styrofoam as a take-out material.

Another example is a program entitled, “One Less Cup,” which encourages students to carry reusable mugs and cups. The program works with coffee shops and food services on campus to promote discounts when campus community members bring their own reusable mug or cup. The program provides a unique “one less cup” sticker. This highlights the importance of reuse and also promotes the program.

Some universities identify green teams in order to promote sustainability and engage their campus community. Carnegie Mellon University has developed a green team program in which a voluntary group of faculty, staff, and/or students are identified as green teams from one department on campus. Their mission is to work together to make that area more sustainable through assessment and action.

Other programs seen on campuses include: green events, green event training, and green event certifications. These programs are designed to promote the greening of campus events that are held daily on college campuses. These programs offer the campus community resources in order for them to successfully green their campus events, and incorporate sustainable practices during the planning of these events. Suggestions are made on ways in which waste can be reduced or eliminated, as well as other conservation initiatives that can be implemented. The certification aspect of event greening is a way to recognize campus community members for their efforts.

Colleges and universities are making efforts toward rewarding positive behavior around sustainability on campus. The University of Colorado at Boulder has been awarding campus sustainability awards to their campus community since the late 90s. These awards range from individual to departmental awards, and also span all areas of sustainability including the environmental, economic, and social areas.

For more information on all the programs described above, please visit appendix A.

VI. Challenges and Opportunities

University Commitments

The university has made commitments within all levels of the administration and support systems that give backing to the Waste Reduction Strategic Plan and zero waste 2022 goal. As this effort progresses in the future, appropriate Sustainability Council members, subcommittees, and stakeholders will be identified and asked to collaborate in an effort to maximize expertise when allocating resources to the initiative. While there are no guiding enforcement rules or penalties with the goals of the zero waste

2022 goal, it will become the responsibility of the entire Appalachian community to engage and ensure that the interim and final goals are appropriately managed and completed.

Financial Commitments

Financial resources available to Appalachian State University have been stressed due to the current economic conditions. Because of this, administrators have taken great care in allocating funds to processes of utmost importance to the university as a system. This is a further example of the commitment throughout the university to achieving the zero waste 2022 goal. As Appalachian works toward accomplishing tasks throughout the zero waste process, financial benefits will be evaluated. Zero waste strategies have been adopted by a wide range of institutions, businesses and agencies with results that have included increased profits resulting from significant cost savings, improved environmental performance, and stronger local economies. Zero waste strategies support all phases of the sustainability movement: healthy economy, healthy environment and a healthy society.

Transparent Data Reporting

Zero waste is an ambiguous term, and a giant leap forward from current campus processes. The multi-disciplinary involvement throughout the university is crucial to success which will be tracked with thorough and transparent reporting. Data collection will be managed by the OS and made available online for education and research. This will also support the OS vision of engaging and empowering students in all curriculums of the sustainable practices and issues occurring in our society today. Through transparency of this process, Appalachian will also be able to further educate our campus community.

VII. Path to Zero Waste

Where to Go from Here

Now 2012-2014

Initiative #1- Conduct a Comprehensive Waste Audit

- Obtain approval to conduct comprehensive waste audit
 - Resource Conservation Specialist and Director of Environmental Health Safety and Emergency Management will partner to develop a waste audit justification to be distributed to the directors at their bimonthly meeting along with proposal provided by Blue Planet Environmental, Inc.
 - Approximate cost estimate: \$32,500 to \$45,000
- Develop audit team to assist with implementation
 - The Resource Conservation Specialist, Graduate Assistant (GA) with the Office of Sustainability, and the Purchasing and Waste Subcommittee of the Sustainability Council will work to develop audit team
 - Various stakeholders will be identified that will assist with the implementation of the waste audit
 - Office of Sustainability
 - Department of Environmental Health Safety and Emergency Management
 - Campus Services within the Physical Plant
 - University Housing
 - Food Services
 - The Purchasing and Waste Subcommittee, audit team, and Director of Materials Management will collaborate to develop a Request for Proposal (RFP) for the audit
- Collaborate with other campuses while developing the RFP
 - Resource Conservation Specialist will be in contact with other universities for consultation during development
- Conduct waste audit through 39 buildings across campus
 - Buildings strategically selected by Resource Conservation Specialist, Director of Campus Services, and Director of EHS & EM
 - Buildings give an accurate representation of the different building types on campus and overall sampling of various types of waste produced
 - The audit team will work with identified agency to ensure audit is conducted within a timely manner
 - Currently a two week window is proposed
- Obtain audit report for each building
 - Report will be provided by the agency conducting the comprehensive waste audit
 - Report will be reviewed by audit team
- Obtain comprehensive consolidated report
 - Report will be provided by the agency conducting the comprehensive waste audit
 - Report will be reviewed by audit team
- Develop step by step reduction plan based on findings

- Resource Conservation Specialist and Purchasing and Waste Subcommittee will continue development of program implementation toward zero waste once results are published

Initiative #2- Expand Reuse and Recycling Efforts

- Institute more recycling opportunities at special events on campus
 - Resource Conservation Specialist and Purchasing and Waste Subcommittee will partner with various campus departments to consult on the expansion of recycling opportunities at all special events- similar to “Recycle at The Rock” initiative
- Develop strategic relationships with local reuse/recycling entities
 - Resource Conservation Specialist will consult with Surplus Manager and Director of Planning, Design, and Construction to begin discussing ways in which these relationships can be moved forward

Initiative #3- Expand Composting Efforts

- Increase pre-consumer food waste collection through Food Services
 - Resource Conservation Specialist and Food Services Director will consult to ensure all pre-consumer food waste is being captured for composting
- Collaborate with Food Services to increase compostable product line
 - Resource Conservation Specialist and Food Services Director will begin to review findings from previous GA study on post-consumer food waste collection of pulped waste at central dining
 - Upon review, compostable product line alternatives will be identified and researched with assistance from GA in Office of Sustainability
 - If deemed cost effective, Food Services will begin purchase of these items
- Coordinate with Food Services to begin post-consumer compost collection
 - Purchasing and Waste Subcommittee, Housing and Dining Subcommittee, and Landscape Services will collaborate on planning for implementation of post-consumer collection of pulped waste at central dining
- Conduct research of post-consumer food waste collection at other universities and state agencies
 - Office of Sustainability GAs will perform research on successful composting programs and summarize their findings

Initiative #4- Institute an Environmental Preferable Purchasing Program

- Establish work group to begin EPP program development
 - Resource Conservation Specialist and Purchasing and Waste Subcommittee will identify other members of the campus community that will be engaged in this process
- Conduct research on EPP programs at other universities and state agencies
 - Office of Sustainability GAs will perform research on successful EPP programs and summarize their findings
 - GA will also sit on the development committee for the EPP program

Initiative #5- Encourage Campus Engagement

- Develop tracking process and mechanism to track sustainability data with regards to waste and report results to the campus community
 - Office of Sustainability GAs will begin development of this process with support of Resource Conservation Specialist

- Develop a green events plan for the campus community to include pilot zero waste events
 - The Office of Sustainability will hire a GA to begin development of the green events plan with support of the Resource Conservation Specialist

The foreseeable tomorrow 2015-2018

Initiative #2- Expand Reuse and Recycling Efforts

- Develop forecasting, budgeting, and contracting procedures for the sale of marketable recyclables
 - Resource Conservation Specialist will consult with Director of Campus Services and Recycling Operations Manager on an on-going basis to ensure most efficient and effective use of resources are allocated toward recycling operations
- Engage Design and Construction in the implementation of a construction and demolition waste plan
 - Resource Conservation Specialist will consult with Director of Planning, Design, and Construction to identify members of the campus community that should reside on a committee dedicated to the progress of a construction and demolition waste plan

Initiative #3- Expand Composting Efforts

- Develop pilot programs to begin post-consumer food waste collection campus-wide
 - Resource Conservation Specialist will work with GAs to begin identification of potential pilot programs around post-consumer food waste collection
 - Office of Sustainability GAs with support of the Resource Conservation Specialist will develop and manage pilot programs in concert with identified departments participating

Initiative #4- Institute an Environmental Preferable Purchasing Program

- Develop EPP program specific to the needs of Appalachian State
 - Identified committee will develop the language around an EPP program for Appalachian State university
 - NC DENR resources and examples will be used to develop this program

On-going efforts towards a sustainable future

Initiative #2- Expand Reuse and Recycling Efforts

- Expand materials collected as recycling markets become available
 - Resource Conservation Specialist and Recycling Operations Manager will continue to follow markets in order to provide timely updates to recycling program
- Establish more recycling locations campus-wide
 - Recycling Operations Manager in consultation with Resource Conservation Specialist will expand special recycling locations across campus for the following materials:
 - CDs, DVDs, electronics, techno-trash, computer equipment
 - Batteries
 - CFL bulbs
 - Plastic bags
 - Printer cartridges
 - Rigid plastics

- Director of Campus Services and Recycling Operations Manager in consultation with Resource Conservation Specialist will establish more walkway recycling availability
 - Install additional big belly solar compactors with attached recycling bin
 - Approximate cost estimate: \$5000 per unit
 - Possible partnership with REI again
- Develop marketing plan and educational materials to support efforts
 - Resource Conservation Specialist will collaborate with an Office of Sustainability GA to develop plan and materials and promote efforts

Initiative #3- Expand Composting Efforts

- Develop marketing plan and educational materials to support efforts
 - Resource Conservation Specialist will collaborate with an Office of Sustainability GA to develop plan and materials and promote efforts

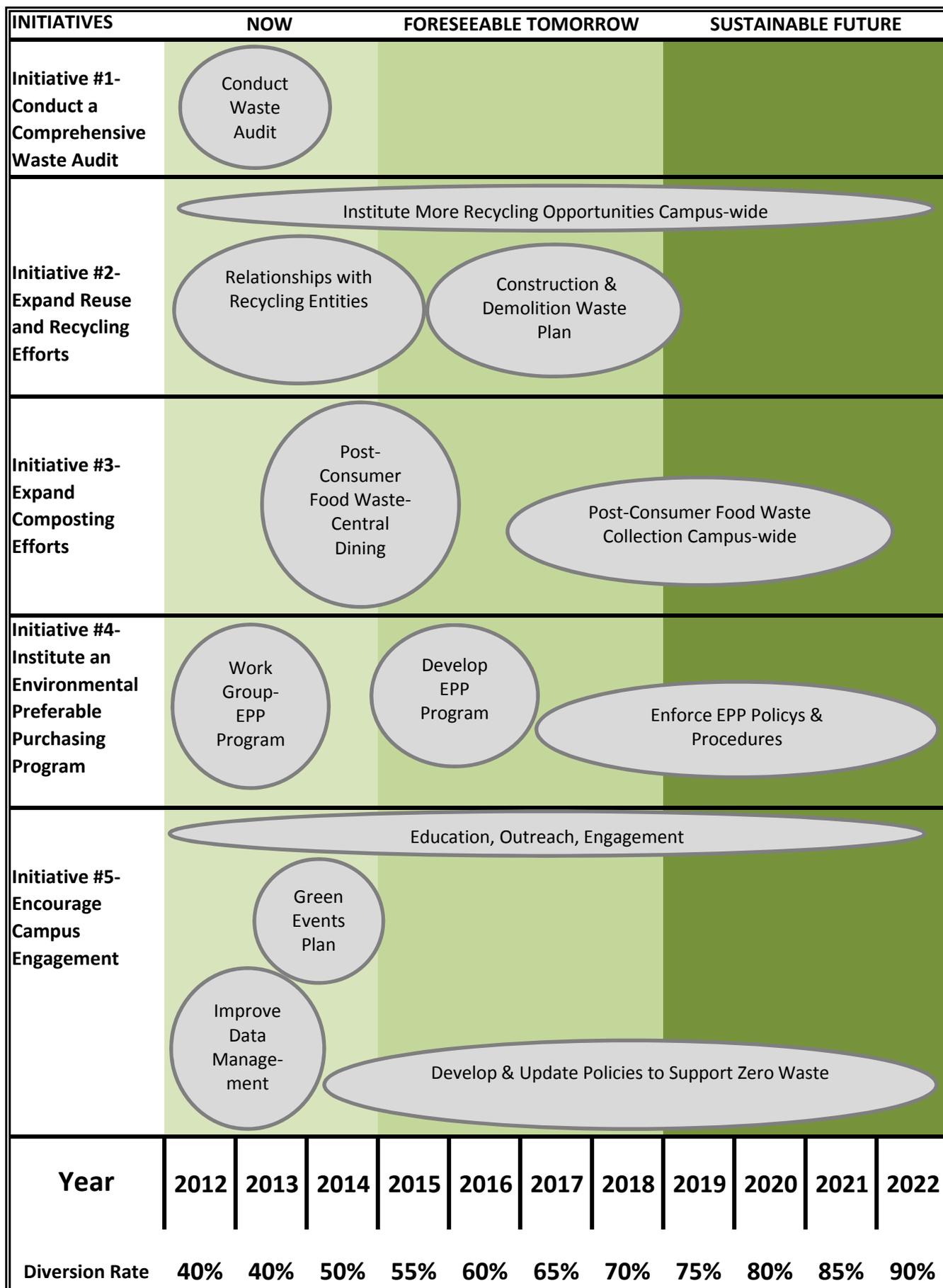
Initiative #4- Institute an Environmental Preferable Purchasing Program

- Educate campus community and enforce policies and procedures
 - Resource Conservation Specialist and Director of Materials Management will work closely with the Purchasing and Waste Subcommittee to ensure the EPP policies and procedures are promoted and enforced throughout campus

Initiative #5- Encourage Campus Engagement

- Identify policies that need to be changed or developed to support the zero waste commitment
 - The Purchasing and Waste Subcommittee with the assistance of a GA in the Office of Sustainability will begin the research and identification of policies related to waste management
 - Once identified, the subcommittee will begin planning around change or development
- Develop a comprehensive education and outreach plan to engage administrators, faculty, staff, and students
 - The Office of Sustainability will hire a GA to begin development of the comprehensive education and outreach plan with support of the Resource Conservation Specialist
- Encourage the paperless office as technologies become available
 - The Purchasing and Waste Subcommittee and Technology Support Services will continually promote electronic alternatives when possible to the campus community

Path to Zero Waste- A Timeline



VIII. Definitions

America Recycles Day – November 15th is the nationally recognized day dedicated to the promotion of recycling in the United States

Appalachian and the Community Together (ACT) – Appalachian State University's clearinghouse for community service, service-learning, and community-based research opportunities within the NC High Country area, as well as across the state, nation, and world. Offering diverse opportunities for individuals and student groups to get involved in human services and environmental advocacy, as well as assist faculty members and community partners with integrating community service projects into their academic courses and local agencies.

Climate Neutrality – Achieving a zero carbon footprint by balancing the measured amount of carbon released into the atmosphere with an equal amount sequestered or offset with carbon credits.

Compost – The product resulting from controlled biological decomposition of organic matter that has been sanitized through the generation of heat and stabilized to the point that has the ability to improve the chemical, physical and biological characteristic of soils or growing media.

Comprehensive Waste Audit – To gain a thorough understanding of generation habits, complete analysis of existing waste and recycling handling and services for a defined area are conducted. The information gathered culminates in the development of a waste reduction work plan.

Consumption – The using and purchasing of goods and services by consumers.

Ecological Footprint – The estimated measure of land and ocean area required to support a human's consumption of goods and services and assimilate their wastes.

Industrialized Waste Management System – Process by which materials are extracted from the earth, transported to manufacturing sites, used to produce products (all materials not part of end product are discarded as waste), then products are transported to users and finally, at the end-of-life, discarded as waste by incineration or disposal in a landfill.

Municipal Solid Waste (MSW) - Commonly known as trash, garbage, refuse or rubbish is a waste type consisting of everyday items that are discarded by the public.

Office of Sustainability – Appalachian State University created the office in 2009 in order to guide and support the university toward its sustainability commitment.

Pre-consumer Food Waste – Food Waste that is discarded by staff within the control of food services. This includes waste in the back of the house including overproduction, trimmings, expiration, spoilage, overcooked items, contaminated items and dropped items. It also includes waste from the front of the house that has remained under the control of the food service operator, including items on cafeteria stations such as salad bars, steam wells, self-serve deli stations, misordered products, and expired grab and go items.

Post-consumer Food Waste – Food waste that is discarded by customers or guests after the food has been sold or served. This waste is under the discretion of the consumer to discard it to landfill waste or compost waste.

Purchasing and Waste Subcommittee – As part of the Appalachian State University Sustainability Council, the subcommittee seeks to increase awareness and accessibility of recycling and composting opportunities on campus and also integrate sustainable purchasing policy.

Sustainability Council – At Appalachian State University this is the largest representative group on campus and seeks to position the university as a national leader in sustainability by ensuring that sustainability principles and policies are integrated throughout the campus' facilities, outreach efforts, programming, educational programs, research initiatives and other activities.

Sustainability – The social, economic and environmental systems that preserve the ability of future generations to meet their own needs.

UNC Policy Manual 600.6.1 – “The University of North Carolina (“The University”) is committed to leading the State of North Carolina as an environmental steward that endeavors to proactively and effectively manage its impact on energy, water and other natural resources. Further, The University is obligated to ensure full compliance with all applicable local, state, and federal environmental laws and regulations. Therefore, it is the policy of The University’s Board of Governors (the “Board”) that The University, including General Administration, the constituent institutions, and affiliated entities, shall establish sustainable development and resource management, or “sustainability” as a core value of institutional operations, planning, capital construction, and purchasing practices.

Budgetary constraints, capital improvement and modernization requirements, and training and management needs required to facilitate the implementation of these sustainable practices are limiting factors and, as such, the University’s General Administration, in collaboration with the constituent institutions and affiliated entities, shall pursue the appropriate enabling legislation and funding to implement this policy. The Board recognizes that the goals of this policy range from short-term to long-term and adds further emphasis on the importance of the aspirational nature of the highest ideals of sustainability. In addition, the Board values Return on Investment (ROI) as a factor in institutional resource planning and decision making and requires an ROI calculation for any new project.”

Waste – All materials that are capable of being diverted from buildings’ waste stream through waste reduction.

Waste Diversion – The diversion of waste from a landfill through reuse, recycling, or composting efforts.

Waste Reduction – The source reduction and waste diversion through reuse and recycling.

Zero Waste – A process that rethinks the way resources and materials flow through the university by taking a whole system approach. This approach will strive to reduce overall consumption, return material goods for reuse, compost all applicable organic matter to promote new growth, and then recycle goods and materials at the end of their usage lifespan.

IX. Resources and Further Reading

The following documents can be accessed by contacting the ASU Office of Sustainability at sustain@appstate.edu or 828.262.2659.

- ASU Strategic Plan (2007)
- ASU 2020 Master Plan (2010)
- UNC-System Sustainability Policy- UNC Policy Manual 600.6.1 (2009)
- State of North Carolina; Executive Order 156 (1996, Gov. Hunt)
- ASU's Sustainability Website: sustain.appstate.edu

Appalachian State Waste Reduction and Recycling
www.recycle.appstate.edu

GrassRoots Recycling Network
<http://www.grrn.org/page/zero-waste>

NC Department of Environment and Natural Resources
Environmentally Preferable Procurement
<http://p2pays.org/epp/index.asp>

Zero Waste Alliance
www.zerowaste.org

Zero Waste America
www.zerowasteamerica.org

Zero Waste International Alliance
www.zwia.org

Appendix A

University of Vermont - One Less Cup Program: <http://www.uvm.edu/~recycle/?Page=zero-waste/one-less.html&SM=zero-waste/zero-waste-menu.html>

University of Wollongong- One Less Cup Program: <http://www.uow.edu.au/about/environment/onelesscup/index.html>

Carnegie Mellon University- Green Teams: <http://www.cmu.edu/greenpractices/greening-the-campus/green-teams/>

North Carolina State University- Green Events Plans: <http://sustainability.ncsu.edu/culture/green-certification/green-events>

University of Colorado at Boulder- Sustainability Awards: <http://ecenter.colorado.edu/greening-cu/campus-sustainability-awards>

UC Davis: Sustainable 2nd Century http://sustainability.ucdavis.edu/progress/waste_reduction/index.html

UC Berkeley Sustainability Plan http://sustainability.berkeley.edu/os/pages/plan/docs/2009_Campus_Sustainability_Plan.pdf

Yale University Sustainability 2010-2013 Plan http://sustainability.berkeley.edu/os/pages/plan/docs/2009_Campus_Sustainability_Plan.pdf



**Office of Sustainability
2012**