FRAMEWORK FOR JOHNSON C. SMITH UNIVERSITY'S SUSTAINABILITY PLAN

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ABSTRACT

On behalf of their client Johnson C. Smith University (JCSU), three Nicholas School Masters of Environmental Management students have composed the framework for a future comprehensive sustainability plan. The purpose is to build an ethos of sustainability on JCSU's campus and in its surrounding communities. The framework is organized through a four-tiered process: creating a University vision, creating a University mission, building a sustainability committee and staff, and implementing specific sustainability strategies. These strategies enumerate short, mid, long-term phasing-in of energy efficiency and greenhouse gas emissions reductions , increased faculty and student awareness through a dorm energy conservation competition and "Eco-Reps" peer education program, improved campus operations in recycling and dining, and community outreach programs.

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MASTERS PROJECT COMPONENTS

PART A

- ***Framework for Johnson C. Smith University's Sustainability Plan***

PART B

- ***Community Sustainability Outreach Report***

PART C

- ***Appendices***

[Part A]

Framework for Johnson C. Smith University's Sustainability Plan

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FINAL REPORT

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1 Executive Summary

Across the United States, colleges and institutions of varying student population sizes and endowment sizes are undertaking impressive efforts to improve the environmental sustainability of their campuses. Some institutions have signed commitments and joined national organizations to support their desire to make campuses more sustainable.

Colleges and universities that are signatories of the American College & University Presidents' Climate Commitment have committed to developing comprehensive plans that describe how their institutions will achieve climate neutrality by a set date in the near future (ACUP, 2010). Other institutions have joined the Association of the Advancement of Sustainability in Higher Education, "an association of colleges and universities that are working to create a sustainable future" (AASHE, 2010).

In keeping with this general interest at institutions of higher education, Johnson C Smith University (JCSU), a historically black institution located in Charlotte, NC, desires to become more sustainable as a campus in regards to a wide range of campus structures and activities. They requested assistance from Duke University's Nicholas School of the Environment, (NSOE) through the group Masters Project process, in creating the framework for a comprehensive sustainability plan that would include as many activities on campus as possible.

Sustainability Framework

Sustainability Vision

• • • •

Sustainability Mission

• • • •

Sustainability Committee

• • • •

Sustainability Staff

• • • •

Sustainability Strategies

Sustainability Strategies

Campus Emissions Reductions

• • •

Campus Sustainability Initiatives

• • •

Education and Awareness

Campus Emissions Reductions

Scope 1

• •

Scope 2

• •

Scope 3

Scope 1

SHORT-TERM

Creating efficiency policies for fleet vehicles

•

Promoting gasoline conservation

LONG-TERM

Purchasing low or no emissions vehicles for fleets

Scope 2

SHORT-TERM

Concentrating students in summer residence halls

•

Removing vendor machine lighting

•

Creating an energy education program

MID-TERM

Installing programmable thermostats

•

Installing occupancy sensors

•

Installing power management software

•

Replacing the gym hot water heater

•

Replacing Exit Signs with LED

LONG-TERM

Converting T-8 lighting to T-12

•

Installing a frictionless chiller

JCSU envisions that their campus plan will include strategies for short and long-term phasing-in of energy efficiency and sustainability mechanisms to reduce energy and utility costs, increased faculty and student awareness of environmental and sustainability issues, and community outreach programs to build an ethos of sustainability on campus and in the surrounding communities.

To help JCSU achieve its sustainability goals, a Nicholas School Masters Project (MP) team, comprised of three Master of Environmental Management students, was formed last year. The team worked with support from The Duke Endowment, Duke University's Sustainability Office, The Nicholas Institute, and the Duke Carbon Offsets Initiative.

Duke University and JCSU are two of four "legacy" schools supported by funding from The Duke Endowment. The Endowment started a sustainability initiative about 3 years ago as a collaborative venture for all four schools to make progress in this area. As part of The Duke Endowment legacy school sustainability initiative, Johnson C. Smith, Davidson, and Furman hired professionals to perform energy audits. JCSU's audit indicated that the campus could reduce energy usage by improving building energy efficiency.

Inspired by the audit results, JCSU expressed interest in developing the campus's inaugural sustainability plan. To continue nurturing cooperation among the Duke Endowment legacy schools around the issue of sustainability, The Duke Endowment provided funding for two of the Nicholas students to perform preliminary research and analysis on sustainability efforts already completed at JCSU, during the summer of 2010. Additionally, students began to evaluate the feasibility of a new campus recycling program.

The students also studied sustainability initiatives of other institutions of higher education and worked on efforts promoting sustainability in communities surrounding JCSU. The full team completed research and data collection for this project during the 2010-2011 fall and spring academic semesters.

The project lead for the JCSU-Duke collaboration is Dr. Sherrill Hampton, who is a Special Assistant to the President and Director of the Center for Applied Leadership and Community Development at Johnson C. Smith. The faculty advisor for the MP is Dr. Charlotte Clark, Visiting Assistant Professor and Associate Director of Education & Training at the Nicholas School. Resources advisors included Tavey Capps, Director of Duke's Sustainability Office and Tanja Vujic, Director of Duke's Carbon Offsets Initiative.

Based on the research conducted, our team has three primary recommendations for JCSU. First, we recommend that Johnson C. Smith develop a sustainability committee that would create the University's inaugural sustainability plan. Members of the committee could also develop a vision and mission for the University's sustainability objectives.

Next, we suggest that Johnson C. Smith network with other institutions in the development, evaluation, and revision of the sustainability plan components. We propose that JCSU stakeholders review the plan on a recurring basis that new goals can be developed as the preceding ones are achieved.

Finally, we recommend hiring full-time sustainability staff. Our findings show that hiring full-time sustainability staff would greatly increase the success of implementing sustainability efforts on campus.

Scope 3

SHORT-TERM

Collecting staff/student commuting data

- Encouraging bicycling
- Increasing recycling

LONG-TERM

Establishing compost program

- Establishing Carpool and Car-Share programs

Campus Sustainability Initiatives

Website Development

- - Recycling
- - Dining

Recycling

SHORT-TERM

Measuring recyclables collected

- Creating clear and uniform signs

MID-TERM

Increasing no. of bins and signs

- Optimizing sign placement
- Purchasing balers for compacting

LONG-TERM

Recycling glass

- Purchasing recycled products
- Recycling at athletic events

Dining

SHORT-TERM

Giving discounts for reusable mugs and cups

- Educating students and staff
- Creating a student dining committee

MID-TERM

Purchasing reusable to-go containers and mugs

- Nutritionist

LONG-TERM

Compost

- Community Garden

Education and Awareness

Dorm Competition

- -

Logo/Slogan Contest

- -

Peer Education Eco-Representatives Program

- -

Earth Day Celebration

- -

Greening of Spring Fling

Continuing with our three primary recommendations, we developed a number of other suggestions that together encompass our suggested JCSU sustainability framework. We divided these recommendations into short-term, mid-term and long-term recommendations based on the costs of the recommendations and ease with which they could be implemented. JCSU could implement short-term recommendations in the 2011-2012 academic year at low cost to the institution.

JCSU might need to invest more financial and personnel resources into mid-term recommendations; these recommendations might require1 to 3 years to implement. Long-term recommendations will generally require significant financial and institutional investments and we suggest that JCSU could implement these strategies over more than three years.

The short-, mid-, and long term recommendations formulated by our team in the area of campus sustainability are summarized in the side-bars of this section. Because Johnson C. Smith is actively involved with the community, the University also requested that our team examine methods to involve neighboring homeowners and businesses in their sustainability efforts.

Part B of this document includes proposals on how JCSU can help create economic opportunities for residents in the surrounding community while simultaneously helping the environment. A summary of recommendations from the community report are provided in the tables on the following page.

Short Term

- Conduct pre/post survey for Green Rehab participants
- Plan reception for Green Rehab participants
- Give regularly occurring Green Home Presentations at monthly neighborhood association meetings and to Green Rehab program participants
- Partner with Asheville Go!, Builders of Hope, Advanced Energy and/or Habitat for Humanity to involve students in green building and home rehabilitation
- Have Charlotte and NC businesses and organizations speak during Fall 2011 Lyceum series on topics related to sustainability and environment

Mid-Term

- Create and distribute a homeowner's manual to Green Rehab participants
- Invite local businesses in the home-building and rehabilitation industries on campus to provide demonstrations to local homeowners on low-cost energy / water savings products
- Organize sustainability-themed conferences with notable speakers and musicians in the environmental and sustainability sectors

Long-Term

- Host a JCSU Home Energy Fair with workshops and vendor booths
- Form JCSU student community service group or independent study course that performs energy audits of local homes/ businesses and helps owners purchase and install energy/water savings products
- Develop fall and/or spring break elective travel field study course focused on alternative energy, energy efficiency, green jobs, or environmental policies

We believe that the strategies in this Masters Project will not only help Johnson C. Smith reduce spending on energy, but decrease the University's impact on the climate as well.

2 A Case for Sustainability in Higher Education

During the late and early twentieth and twenty-first centuries, global climate change and sustainability have emerged as two dominant issues, because both have affected and will increasingly affect every sector of human civilization for generations. The United Nations Framework Convention on Climate Change (UNFCC) defines global climate change as "an alteration of the composition of the global atmosphere with natural climate variability observed over long time periods" (United Nations 1994).

The UNFCC maintains that the planet is experiencing such a climate change as a result of anthropogenic greenhouse gas emissions and that such a climate change will have lasting effects on the natural for generations to come. Sustainability can be broadly defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs (United Nations, 1987).

Across the United States, colleges and institutions of varying student population sizes and endowment sizes are undertaking impressive efforts to improve the environmental sustainability of their campuses. In addition, according to the most recent posting on its website in April 2011, the American College and University Presidents' Climate Commitment, (ACUPCC) lists 677 institutions that have signed commitments to initiate comprehensive plans that will allow their institutions to achieve climate neutrality by a set date in the near future (ACUPCC, 2011). This commitment will be achieved "by empowering the higher education sector to educate students, create solutions, and provide leadership-by-example for the rest of society" (ACUPCC, 2010).

Moreover, the commitment provides a framework and support for American college and university signatories to implement comprehensive plans toward the goal of climate neutrality. In addition, as of March 2010, 166 institutions of higher education in the United States have signed the Talloires Declaration, which is an official commitment by university presidents, chancellors, and rectors to improve environmental sustainability in higher education (United Leaders for a Sustainable Future, 2010). The Talloires Declaration is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at signatory colleges and universities (United Leaders for a Sustainable Future, 2010).

With or without these highly visible, binding commitments, 40 institutions have made campus climate action plans, 37 have made campus sustainability and environmental plans, 49 have made master plans that incorporate sustainability, and 41 have made strategic plans that include sustainability according to the Association of the Advancement of Sustainability in Higher Education (AASHE) (2011j). Although climate action plans and sustainability plans may be related and have some overlapping goals, the specific purpose of each type of plan is different. Thus, climate action plans and sustainability plans may use different strategies and have different implications for campus operations.

The objective of a climate action plan is to bring the institution of higher education into climate neutrality, i.e. emit zero net greenhouse gas emissions within a defined time period. Climate action plan strategies focus on inventorying all greenhouse gas emissions related to the university's functioning and on eliminating emissions through alternate human behavior, substitute technologies, and/or carbon equivalent offsets (ACUPCC, 2010).

In contrast, a sustainability plan is the development of a system that helps to create a vibrant campus economy and high quality of life for university and community members while simultaneously respecting the need to sustain natural resources. Sustainability plan strategies typically address student education, faculty research, community outreach, and campus operations (Willard, 2006).

Both types of plans have proven effective in organizing and managing climate action and sustainability projects. Sustainability plans are typically more comprehensive than climate action plans. Operations aspects such as water, waste, and food provision might not be included in a climate action plan, but would likely be included in a sustainability plan.

This report provides a framework for Johnson C. Smith University (JCSU) to develop its inaugural Campus Sustainability Plan. Johnson C. Smith has expressed interest in having assistance with creating the framework for a comprehensive sustainability plan that will include as many activities on campus as possible. This document is classified as a sustainability "framework" and not as a "plan" because the actual plan should be developed by a group of JCSU faculty, staff, and students.

This document provides guidance and suggestions for developing the future committee or working group that JCSU would assemble in their efforts to create JCSU's campus

sustainability plan. This document also provides recommendations on some key high priority areas of sustainability on JCSU's campus. Johnson C. Smith has specifically expressed interest in addressing the issues of energy efficiency, greenhouse gas emissions, waste management, and environmental awareness on campus. Because the University's overall vision is to be the premier, independent, urban university for learning, teaching, and service to the community and society at large, JCSU seeks to improve its environmental sustainability to meet this vision.

Section 6 of this report provides information on how JCSU can increase sustainability on its campus, through strategies for short, mid, and long-term phasing-in of energy efficiency and sustainability mechanisms to reduce energy and utility costs and through increased faculty and student awareness of environmental and sustainability issues.

3 A Case for Sustainability in Communities

In the United States, activists and community leaders have begun to address sustainability in communities and to advocate for novel ways to reduce global climate change and simultaneously encourage economic development. In the past several decades, organizations and activists have made incredible strides in helping diverse populations to be active participants in environmental opportunities. Although environmental degradation and exhaustion of natural resources affect everyone, most of the public is often absent from environmental decision-making.

Elizabeth Kolbert, in an article for the New Yorker profiling environmental activist Van Jones, points out that many modern environmental activists, including John Muir and Rachel Carson, saw themselves as "fighting narrow, private interests on behalf of the public in the broadest sense" (2009) But as Kolbert also points out, the broad public that Muir and Carson fought for is generally not part of environmental organizations. She continues, "Stop by a meeting of any of the major environmental groups, and you will see that the broad American public has yet to join up. Chances are that most of the attendees will be white, and the few who aren't will be affluent and middle-aged" (Kolbert, 2009).

Around the country, activists like Majora Carter and Van Jones are trying to counter this trend and make environmentalism more accessible to people of diverse socioeconomic and

racial backgrounds and to encourage job creation in the green sector as a way to lift communities out of poverty (CNN, 2008; Kolbert, 2009).

Majora Carter helped form the Bronx Environmental Stewardship Training program after seeing how environmental restoration projects helped provide opportunities to employ individuals in the South Bronx that faced barriers to employment. The Bronx Environmental Stewardship Training program was one of the nation's first systems for green-collar job training and job placement (Major Carter Group, 2011).

Van Jones, founder of organization Green for All and author of the book *The Green Collar Economy: How One Solution Can Fix our Two Biggest Problems*, has also advocated for green jobs training and placement as a way to alleviate poverty. He has helped to involve mainstream environmental leaders in economic development and helped to interest people of different racial and socioeconomic backgrounds in environmental issues across the country (Lewis, 2009).

Promoting sustainability in communities is important to Johnson C. Smith University because of the University's strong commitment to community development and service to community members. Johnson C. Smith is trying to help revitalize the Beatties Ford Road Corridor by helping community members to take full advantage of the green economy.

Part B of this document provides information on how JCSU can make the case for increasing sustainability in its community, including community outreach strategies that would build an ethos of sustainability in communities surrounding the University. JCSU has hosted a workshop for women entrepreneurs to educate them about opportunities for green entrepreneurism and greening existing business ventures. The report in *Part B* will highlight how JCSU can help create economic opportunities for residents in surrounding communities while simultaneously helping the environment.

4 Overview of JCSU and the Duke Endowment

4.1 Johnson C. Smith University

Johnson C. Smith University (JCSU) is a private, co-educational, four-year, liberal arts institution that is centrally located in Charlotte, North Carolina. JCSU is a historically black institution and is a designated HBCU (historically black college or university). The Higher Education Act of 1965 defines an HBCU as "…any historically black college or university that was established prior to 1964, whose principal mission was, and is, the education of black Americans, and that is accredited by a nationally recognized accrediting agency or association determined by the Secretary [of Education] to be a reliable authority as to the quality of training offered…" (U.S. Department of Education, 2011). The University occupies 105 acres of land and currently has over 1,500 students and approximately 240 full-time employees. JCSU is the first HBCU to become an IBM ThinkPad University and has a unique service-learning approach, combining academics and community service (Johnson C. Smith University, 2010).

Since the institution's inception in the 1800's, JCSU has had a significant influence on Charlotte's Beatties Ford Road corridor, which connects the campus to its surrounding neighborhoods. Two Presbyterian ministers who wanted to create a higher learning establishment in the Charlotte region founded the University in 1867. Following the Civil War, JCSU (originally the Biddle Institute) trained black educators and ministers and contributed to a flourishing neighborhood. In the 1960's, the construction of Interstate 77 through the area initiated an economic decline in the Beatties Ford Road corridor that worsened in the following decade (Singe, 2010).

Johnson C. Smith's current president, Dr. Ronald Carter, envisions that the University will continue to be a beacon in the community. Since President Carter began his term in 2008, JCSU has committed to investing in the revitalization of the Beatties Ford Road corridor and has encouraged private development in residences, retail shops, and other points of interest (Johnson C. Smith University, 2008; Singe, 2010).

4.2 The Duke Endowment

James B. Duke signed an Indenture of Trust in 1924 that established the Duke Endowment. Duke, an industrialist who acted as a major player in both the tobacco and hydroelectric power industries, sought to continue his family's legacy of giving for worthy causes (the Duke Endowment, 2010a). In explaining his thoughts on starting the Duke Endowment, Duke says in the seventh section of the Indenture of Trust, "My ambition is that the revenues of such developments [hydroelectric power] shall administer to the social welfare, as the operation of such developments is administering to the economic welfare, of the communities which they serve" (Superior Court for Mecklenburg County, 1972).

James B. Duke's Indenture of Trust establishes the division of net "incomes, revenues and profits each calendar year" among different causes and delineated where funds from the Duke Endowment would go. Among these causes, Mr. Duke listed hospitals, preachers in the Methodist Church, rural Methodist churches, orphans, and four institutions of higher education in the Carolinas as beneficiaries. The four institutions of higher education, known as the legacy schools, that benefit from receiving Duke Endowment funds are Duke University, Davidson College, Furman University, and Johnson C. Smith University (Superior Court for Mecklenburg County, 1972).

4.3 The Partnership between the Duke Endowment and JCSU

The Duke Endowment has provided substantial financial support to Johnson C. Smith over the past century. In the years 2007, 2008, and 2010, the Duke Endowment gave Johnson C. Smith $1.2 million each year (the Duke Endowment, 2010d). In 2009, the Duke Endowment awarded Johnson C. Smith University more than $5.7 million in grant money for support of Metropolitan College, for support of the Center for Applied Leadership and Community Development, and for support of an "enrollment management initiative" (the Duke Endowment, 2010d).

4.4 The Duke Endowment's Campus Sustainability Initiative

In 2008, the Duke Endowment started an initiative to help Davidson, Duke, Furman, and Johnson C. Smith to be more environmentally sustainable schools. This $500,000 initiative is unique in that it was the first Duke Endowment grant to benefit all four Duke

Endowment legacy schools (Duke Endowment, 2010e). As one component of efforts to foster cooperation among the Duke Endowment legacy schools around the issue of sustainability, the Duke Endowment supported Master of Environmental Management students at Duke University's Nicholas School of the Environment to work with Johnson C. Smith University on a framework for JCSU's comprehensive sustainability plan.

5 Key Issues

JCSU asked the Duke Master of Environmental Management (MEM) student team to focus on at least three primary issues in the framework for the inaugural sustainability plan. The framework seeks to address three primary issues: energy efficiency in built structures, fostering sustainability on campus, and inspiring community engagement around sustainability. These focus areas are discussed further below.

5.1 Energy Efficiency in Built Structures

Built structures account for an estimated 40% of greenhouse gas emissions worldwide. Because the energy used to provide heating, cooling, and electricity for campus buildings is typically the part of campus operations that emits the most greenhouse gas emissions and uses the most energy, energy conservation in buildings is a cost-effective way for campuses to reduce greenhouse gas emissions. Furthermore, implementing energy efficiency improvements can help universities realize10-20% annual energy savings (Second Nature, 2011).

To determine where energy conservation measures are most cost effective, a campus may begin with an overall energy audit. To provide this baseline assessment for JCSU, the Duke Endowment funded professional audit company Advanced Energy to conduct an energy audit at Johnson C. Smith in 2009. This audit provided the University with an analysis of campus energy usage and with suggestions for improvements.

According to this report, in 2008 JCSU emitted 6,660 tons of carbon dioxide (Welch, 2009). The report stated that Johnson C. Smith used similar electricity amounts per square foot to other regional institutions and had gas usage about 25% below the average of institutions in the region. The report found that JCSU could make significant improvements in energy efficiency, rating many campus buildings as "Below Average" or "Poor" in energy efficiency. The Advanced Energy report provided Johnson C. Smith with a list of high

priority and low cost suggestions that the University could take to reduce its environmental impact and save money on energy bills.

The report concluded that JCSU could save over 32% of its existing energy costs if the campus instituted the Advanced Energy report recommendations in full (Welch, 2009). The Duke team used the findings from the Welch report as a basis for the reduction of greenhouse gas emissions under the sustainability strategies section of the sustainability framework.

5.2 Fostering Sustainability on Campus

Johnson C. Smith University expressed that they wanted the Duke-student team to focus on more than just greenhouse gas emissions and energy efficiency, and the University knew that other primary tasks could lead to both reductions in emissions and to other environmental gains. Key stakeholders at every level of the University had discussed sustainability to some degree for the last few years.

As a result, the University specifically asked the Duke -student team to focus on the following campus sustainability areas: waste reduction and education and awareness. These areas would affect administrators, faculty, staff, and students alike. The Duke team treated these areas as foundation to foster sustainability on campus and investigated other areas to reinforce that foundation. Strategies that address the foundational issues and supplemental issues appear under the sustainability strategies section of the sustainability framework.

5.3 Inspiring Community Engagement

Johnson C. Smith hopes to positively impact the communities around its gates through programs that empower community members to actively participate in the green economy and to make sustainable choices in their everyday lives. Johnson C. Smith University has been an important part of the Beatties Ford Road corridor since the institution's inception in the 1800s. After the Civil War, JCSU (then the Biddle institute) trained black educators and ministers and contributed to a thriving neighborhood.

Economic decline in the Beatties Ford Road corridor began in the 1960s and hastened in the following decade with the construction of Interstate 77 (Singe, 2010). Since

President Carter began his term in 2008, JCSU has committed to investing in revitalizing the Beatties Ford Road corridor and has encouraged private development in residences, retail shops, and other points of interest (Singe, 2010). Green business and environmental awareness outreach will be a part of a larger effort to bridge the gap between uptown Charlotte and the Beatties Ford Road corridor.

Figure 1 shows a map of the Beatties Ford Road corridor. Some of the neighborhoods in the Beatties Ford corridor include: Biddleville, Smallwood, Five Points, Dalebrook, Eleanore Heights, Northwood Hills, Northwood Park, Hyde Park, Lakeview Village, Lincoln Heights, McCrorey Heights, Northwood Estates, Oaklawn Park, Oakview Terrace, Seversville, Washington Heights, and Wesley Heights. Sustainability findings and recommendations for homeowners and business in the neighborhoods adjacent to JCSU are provided in the Community Sustainability Outreach Report (Part B).

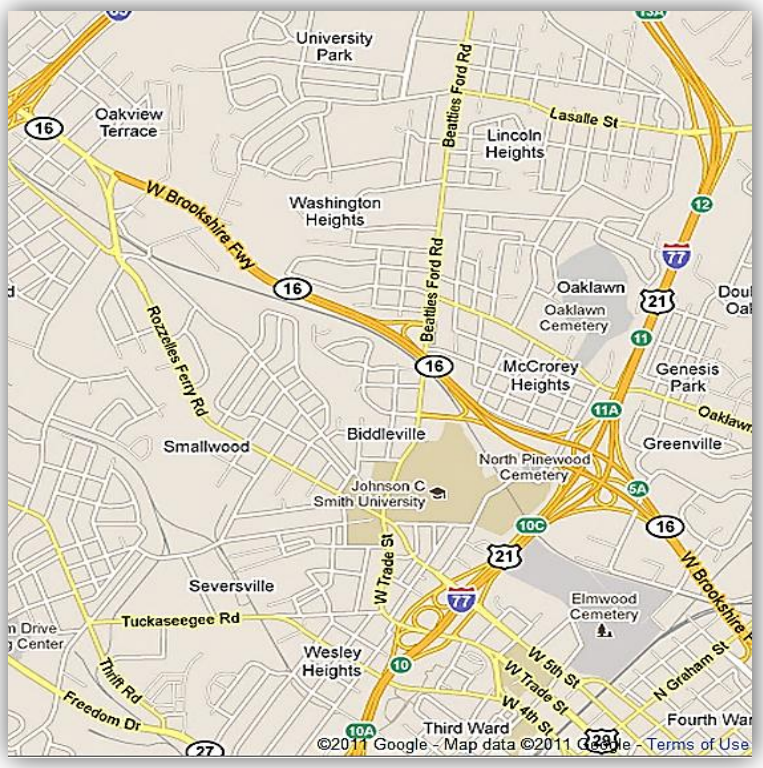

Figure 1: Beatties Ford Rd Corridor in Charlotte, NC. Source: Google Maps 2011

6 Campus Sustainability Framework

Our team views JCSU's inaugural campus sustainability plan as being a "living document." Specifically, the plan should be periodically reviewed and updated with new goals and achievements and should not be treated as fixed, rigid, or immutable. Marsha Willard a CEO for AXIS, a major sustainability consulting firm, said about sustainability planning, "It's not about the plan; after all, so much as it is about the conversation that creates it" (2006). Furthermore, another sustainability consulting firm, Good Company, suggest that successful sustainability plan implementation requires a committee of key stakeholders to continually propose new improvements as the organization becomes more sustainable (Good Company, 2011).

In keeping with this approach, our team recommends that Johnson C. Smith follow a four-tier process to achieve their sustainability goals. Inspired by an article written by Luis Velasquez et al in 2006, the four tiers are as follows:

- **Tier 1:** Create a Vision
- **Tier 2:** Create a Mission
- **Tier 3:** Create a Sustainability Committee and Staff
- **Tier 4:** Create Sustainability Strategies

In the case of Johnson C. Smith, the University should start where it is best poised. We recommend the University focus on Tiers 3 and 4 first so that it may have time, experience, and success in managing a sustainability program before creating an official, formal vision and accompanying mission statement on sustainability.

Although each tier conceptually flows from the other parts, i.e. tier one leads into tier two which leads into tier three which leads into tier three, in practice each relates to the others iteratively. That is, a group of sustainability staff can be working full time implementing a host of sustainability strategies, all which can add clarity to a sustainability committee in creating a holistic university vision; and, once the vision is established, new missions and goals can be made that influence existing or new sustainability strategies. In short, a hierarchical process does not need to exist before specific action at the strategic

tier. Rather, an institution of higher education may begin its sustainability planning process at any of the tiers.

All four tiers must be in place in order for a university to have an effective campus sustainability program. The integration of these four tiers and the campus sustainability process are portrayed below in Figure 2. In this framework, the sustainability vision of the University will help to create a mission with more actionable goals. The sustainability vision and mission of Johnson C. Smith University can serve as guide points for the Campus Sustainability Committee and Campus Sustainability Staff on the third level.

The Campus Sustainability Committee and Staff can then work to plan and implement sustainability strategies. The categories for different sustainability strategies and representative programs are pictured on the fourth tier. These strategies are not an exhaustive list, but a list of potential areas of focus. Our report will highlight suggestions for many of these topics.

Embedded throughout the University sustainability framework is networking with other institutions. The words in the corners of the framework emphasize the iterative nature of this process as the University, plans campus sustainability strategies, implements those strategies, reviews the strategies to determine effectiveness and potential areas for improvements, and acts to change or continue sustainability strategies. In this section, we describe the four tiers of the campus sustainability framework for Johnson C. Smith University. We begin by stating our recommendations, explaining the methods we used to form our recommendations, and sharing the resulting findings that led us to the concluding recommendations.

The sustainability framework section commences with networking because of the potential for networking to assist JCSU in all of its plans. Networking with other institutions is important to learn about best practice examples and to share ideas. We then describe the significance and methods for research of Tier 1 (Creating a Vision), followed by Tier 2 (Creating a Mission), Tier 3 (Forming a Campus Sustainability Committee and Hiring Campus Sustainability Staff), and Tier 4 (Sustainability Strategies). Tier 4 includes the strategies for making sustainability improvements on campus and for creating an ethos of sustainability through education and awareness.

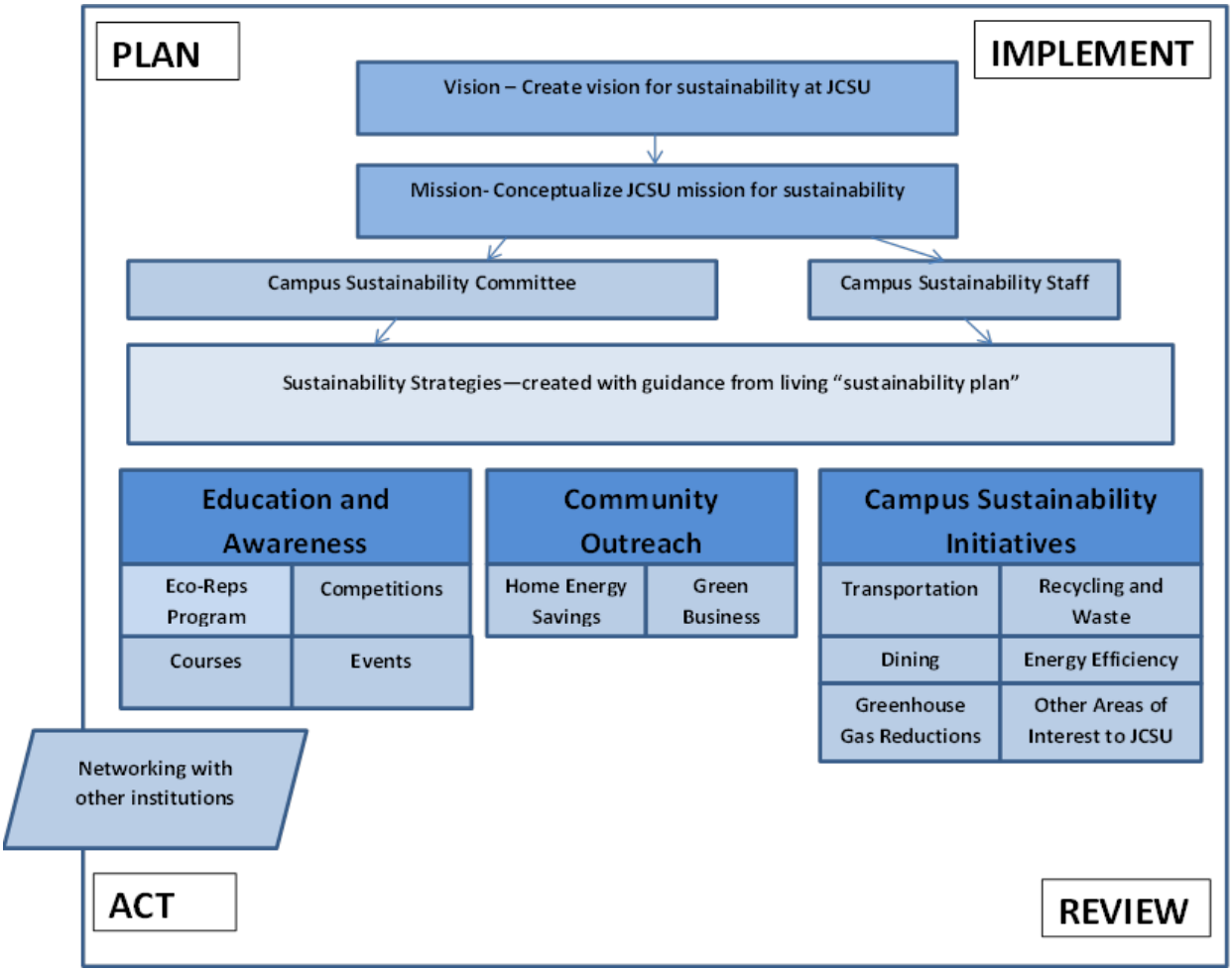

Figure 2: graphical representation of how the framework for campus sustainability, format inspired by Velasquez (2006)

6.1 Networking with Other Institutions

Networking among institutions permeates the entire campus sustainability framework. JCSU might collaborate with institutions such as the TDE legacy schools, other HBCUs, other higher education institutions in North Carolina, and other nationally top-ranked universities and colleges with similar size or location similarities to JCSU.

Another way to network is to rely on a clearinghouse for sustainability in higher education. The most robust and well-respected such clearinghouse is the Association for the Advancement of Sustainability in Higher Education (AASHE), which is a professional, membership-based association of colleges and universities in the United States and Canada (2010). It serves as an umbrella organization for the campus sustainability community and partners with government agencies, NGOs, and businesses that support sustainability efforts.

More importantly, it provides many resources for administrators, staff, faculty, students, and stakeholders to implement numerous sustainability programs, ranging from dining to green building (AASHE, 2010). We recommend that JCSU become a member of AASHE, so that students, faculty, and staff could access the numerous services and resources of AASHE, including: national and regional conferences, workshops, other professional development opportunities; online resource center and discussion lists; collaborative networking opportunities with other campuses and organizations; individual campus consulting; and, publicity and recognition opportunities.

6.2 Creating a Campus Sustainability Vision

6.2.1 Background and Methods

We recommend that JCSU create an environmental mission statement. We base this recommendation principally based on three sources. First, from our literature review, Velasquez presented a comprehensive model for a sustainable university (2006) based on survey and empirical data collected from 80 institutions of higher education from around the world, and concluded that the first step to any sustainability program is to envision and define sustainability in its broadest form for the university.

Second, AASHE listed 17 colleges and universities that have adopted policies that address multiple dimensions of sustainability (i.e. economic, social, and environmental) and 89 colleges and universities that have adopted policies that focus on environmental aspects of sustainability (AASHE, 2011i). Although the language differs slightly, these policies constitute sustainability visions as described by Velasquez and colleagues.

Third, both Duke University and Vanderbilt University, institutions that serve as peers to Johnson C. Smith University, have sustainability vision statements. The team includes Vanderbilt and Duke as peer examples for Johnson C. Smith University because the institutions share the following important characteristics with JCSU: location in the southeastern United States, statuses as private institutions, and student bodies that include students from across the region and country. Furthermore, Vanderbilt and Duke both have thriving campus sustainability programs that JCSU can model and the Duke team has extensive and intimate familiarity with these programs.

A vision statement articulates an ideal future. It would represent what JCSU wants to become with respect to sustainability. This step provides the opportunity to tailor what sustainability means to JCSU and to incorporate that definition into the University fabric. Below are two example environmental vision statements from Vanderbilt University (2011) and Duke University (2011):

> *"Vanderbilt University is a local and global community leader committed to environmental stewardship, protecting natural resources, and enhancing quality of life while maintaining academic, medical, social, and economic productivity."*

> *"Duke University seeks to attain and maintain a place of leadership in environmental and sustainable ecologies on our campus, in our medical institutions, and in the larger community of which we are a part. We will bring proactive vision, intellectual intensity, and high ethical standards to our pursuit of environmental leadership with research and teaching, institutional operations, and our relationship with the community."*

6.2.2 Recommendations

The University should create an environmental vision statement as an official policy. This can provide an unambiguous starting point for constructive conversation. An environmental vision statement can build from the existing JCSU mission statement. It could be modeled after exemplar statements from peer institutions, such as from Vanderbilt University and Duke University. The ideal group to compose such a statement is the Sustainability Committee, along with the Sustainability Staff, as they will represent the multiple stakeholder interests connected with the University. Such a tacit will also engender buy-in among all of the stakeholder groups.

6.3 Creating a Campus Sustainability Mission

6.3.1 Background and Methods

We recommend that JCSU create a campus sustainability mission statement. Our methodology follows what was previously stated in the vision section. Velasquez (2006) suggest that creating an environmental mission statement makes the correlated vision statement more tractable. Whereas the vision is typically broad and far-reaching in scope, the mission of a university is more specific and can change over time. In short, such a commitment to an environmental ethos in thoughts, actions, and facilities provides a foundation for future potential changes at any particular college or university. Below are example mission statements from Vanderbilt University (2011) and Duke University (2011):

> ***VANDERBILT CAMPUS SUSTAINABILITY MISSION STATEMENT***
>
> *THROUGH PROACTIVE EDUCATION, RESEARCH, AND OUTREACH, VANDERBILT UNIVERSITY STRIVES TO:*
>
> *DEVELOP AND TRANSFER KNOWLEDGE, INCREASE AWARENESS, AND PROMOTE LIFELONG LEARNING ABOUT SUSTAINABILITY BEST PRACTICES FOR THE BENEFIT OF STAKEHOLDERS WHO COMPRISE THE VANDERBILT COMMUNITY (STUDENTS, PATIENTS, FACULTY, STAFF, ALUMNI, AND VISITORS), AS WELL AS THE BROADER NASHVILLE, STATE, NATIONAL, AND GLOBAL COMMUNITIES;*
>
> *ACHIEVE THE HIGHEST STANDARDS OF SUSTAINABILITY THROUGH A PROCESS OF ENVIRONMENTAL RESPONSIBILITY AND ACCOUNTABILITY AT EVERY LEVEL OF UNIVERSITY ACTIVITY; AND, CONSISTENTLY IMPLEMENT, MONITOR, EVALUATE, AND IMPROVE OUR PROCESS.*

DUKE CAMPUS SUSTAINABILITY MISSION STATEMENT

ACADEMICS. *DUKE UNIVERSITY WILL CONTINUE TO BE IN THE FOREFRONT OF ENVIRONMENTAL RESEARCH AND EDUCATION AND WILL CONTINUE TO USE OUR INSTITUTIONAL CAPABILITIES TO CONSTRUCTIVELY AFFECT ENVIRONMENTAL POLICY THROUGHOUT THE WORLD. WE ARE COMMITTED TO SUPPORTING INTERDISCIPLINARY ENVIRONMENTAL SCHOLARSHIP AND RESEARCH, DISSEMINATING INFORMATION ABOUT RESEARCH AND POLICY, INCREASING FACULTY AND STUDENT AWARENESS OF ENVIRONMENTAL ISSUES, AND ENHANCING EDUCATIONAL OFFERINGS.*

OPERATIONS. *DUKE UNIVERSITY WILL COMPLY WITH ALL RELEVANT ENVIRONMENTAL LAWS AND REGULATIONS AND GO BEYOND THE REQUIREMENTS FOR COMPLIANCE BY INTEGRATING THE VALUES OF SUSTAINABILITY, STEWARDSHIP, AND RESOURCE CONSERVATION INTO OUR ACTIVITIES AND SERVICES. WE WILL MAKE DECISIONS WITH THE GOAL OF IMPROVING THE LONG-TERM QUALITY AND REGENERATIVE CAPACITY OF THE ENVIRONMENTAL, SOCIAL, AND ECONOMIC SYSTEMS THAT SUPPORT THE UNIVERSITY'S ACTIVITIES AND NEEDS. WE WILL ENGAGE IN POLLUTION PREVENTION ACTIVITIES AND DEVELOP AND PROMOTE PRACTICES THAT MAXIMIZE BENEFICIAL EFFECTS AND MINIMIZE HARMFUL EFFECTS OF OPERATIONS, RESEARCH, AND ACTIVITIES ON THE SURROUNDING ENVIRONMENT. WE ARE COMMITTED TO ASSESSMENT OF THE ENVIRONMENTAL IMPACTS ASSOCIATED WITH OUR ACTIVITIES AND SERVICES, AND WE WILL DEVELOP AND TRACK MEASURES OF OUR PROGRESS.*

COMMUNITY. *DUKE UNIVERSITY IS COMMITTED TO PLAYING A CONSTRUCTIVE AND COLLABORATIVE ROLE AS A RESPONSIBLE ENVIRONMENTAL CITIZEN IN THE LIFE OF THE SURROUNDING COMMUNITY. WE WILL MAINTAIN A POSITIVE AND PROACTIVE ROLE IN COMMUNICATING WITH THE SURROUNDING COMMUNITY, ESPECIALLY THE DURHAM COMMUNITY, REGARDING OUR ENVIRONMENTAL ACTIVITIES AND PERFORMANCE*

6.3.2 Recommendations

We recommend that the University create an environmental mission statement as an official policy. This mission statement can provide an unambiguous starting point for constructive conversation. An environmental vision statement can build from the existing JCSU mission statement. It could be modeled after exemplar statements from peer institutions, such as from Vanderbilt University and Duke University. The ideal group to compose such a statement is the Sustainability Committee, along with the Sustainability Staff, as these groups will represent the multiple stakeholder interests connected with the University. These groups can also encourage buy-in from all stakeholder groups. Importantly, by specifying the principal missions of the University, the Sustainability Committee and Sustainability Staff provide the justification to enact specific strategies that align with the objectives of the mission.

6.4 Forming a Campus Sustainability Committee

6.4.1 Background and Methods

To make recommendations about forming a sustainability committee, our team reviewed primary literature on campus sustainability as well as publications on strategic planning and adaptive management in other settings. In addition, we used analysis of the results of two assessment systems for campus sustainability to make suggestions about the effectiveness of campus sustainability committees and different approaches. These two assessment systems are described below.

The first assessment system, AASHE STARS (Sustainability Tracking, Assessment & Rating System) is a framework for universities and colleges to help these institutions measure their sustainability efforts (AASHE, 2011b). We reviewed STARS submissions from all 39 schools that have been rated by AASHE based on completed STARS applications. (AASHE, 2011a).

The second rating system, the College Sustainability Report Card, is released annually by The Sustainable Endowments Institute, which rated 322 schools in 2011. The Report Card rates the 300 universities and colleges with the largest endowments in the United States and Canada in addition to 22 schools that have submitted applications for inclusion. The College Sustainability Report Card rates schools with standard report card grades. A is the highest grade, F is the lowest. (Sustainable Endowments Institute, 2011a).

The team reviewed results from the 2011 College Sustainability Report Card reviews. The College Sustainability Report Card website has filters to compare and sort schools based on different sustainability measures (Sustainable Endowment Institute, 2011b). The College Sustainability Report Card rated 13 schools with endowments smaller than 50 million dollars and 21 schools with endowments smaller than 100 million dollars (Sustainable Endowments Institute, 2011b).

6.4.2 Recommendations

Forming a sustainability committee should be a short-term goal of Johnson C. Smith University to help the University achieve its sustainability mission. A high percentage of the rated schools studied had campus sustainability committees; these data further support our recommendation that Johnson C. Smith should create a campus sustainability

committee. About 95% of the AASHE STARS reporting institutions have sustainability committees (AASHE, 2010a). 95.03% of the Campus Sustainability Report Card rated institutions have sustainability committees.

Of the Campus Sustainability Report Card rated institutions with grades of B and higher, 98.4% had sustainability committees. The three other Duke Endowment schools, the six schools in North Carolina, and the three historically black colleges and universities rated by the Campus Sustainability Report Card all have campus sustainability committees[1] (Sustainable Endowments Institute, 2011b, AASHE, 2011a). Therefore, JCSU has plenty of exemplar peer institutions to learn from when forming its own sustainability committee. The high percentage of peer institutions with campus sustainability committees emphasizes the necessity for Johnson C. Smith to put high priority on designing and forming a campus sustainability committee.

The role of a campus sustainability committee as we recommend it will first be explained. This description will be followed with recommendations for forming a campus sustainability committee and the organizational structure of the committee.

6.4.2.1 Role of a Campus Sustainability Committee

Once Johnson C. Smith University has formed a vision for sustainability and a mission for accomplishing these ideals, creating a campus sustainability committee will help the University reflect its commitment to sustainability. A campus sustainability committee can help JCSU incorporate its sustainability vision into University operations (Velasquez et al, 2006). This committee will become the main decision-making level for sustainability on JCSU's campus. Although a committee shouldn't take over or duplicate efforts already in place, a committee can help the University to avoid overlapping efforts and to ensure that policies are effectively implemented (Velasquez et al, 2006).

A committee can also help to catalyze sustainability efforts by creating responsibility for fulfilling sustainability goals and obligations (Allen, 1999, Clugston and Calder, 1999).

[1] The College Sustainability Report Card indicates that Wake Forest does not have a sustainability committee; however, Wake Forest received the AASHE STARS credit for a campus sustainability committee. The College Sustainability Report Card submission date was in July 2010, while the AASHE STARS submission was in January 2011 (Sustainable Endowments Institute, 2011b; AASHE, 2011a). The AASHE STARS data is used over the College Sustainability Report Card data when they are in conflict because the AASHE STARS data is more recent.

For Johnson C. Smith, we recommend that the members of the committee help form campus sustainability policies and help create responsibility for achieving sustainability goals through formation of the campus sustainability plan.

6.4.2.2 Membership Campus Sustainability Committee

We recommend choosing or appointing members of the committee that represent key groups, decision makers, and resource persons around campus because the committee will have such an important role in shaping the course of sustainability at Johnson C. Smith University. JCSU may also want to have community members serve on its campus sustainability committee because of the University's close link to the Beatties Ford Road Corridor and larger Charlotte metropolitan area. Velasquez and colleagues noted that including all "key players in the university community" in campus sustainability committees was important, including "some representation of honorable members of the surrounding society" when possible (2006).

Of the AASHE STARS schools that had sustainability committees, 86.5% included students, faculty, and staff while 91.9% included faculty and staff. Only 8% of the AASHE STARS institutions with sustainability committees included community members or local officials. The types of members that we suggest appointing are listed below with explanations of what these members could potentially contribute to the sustainability committee. Although we suggest including all of these types of members because they are important stakeholders on JCSU's campus, the descriptions below include some ways that each of these stakeholder groups could contribute to the sustainability committee.

6.4.2.2.1 Administrators

Having administrators as participants in the campus sustainability committee can help to ensure that the goals of the campus sustainability are consistent with the goals of the University. Administrators play an important part in University decision-making and are thus a vital component of the campus sustainability committee. Administrators can also help to assign responsibility for fulfilling sustainability goals and obligations (an important part of helping catalyze sustainability on campus according to Allen, Clugston and Calder (1999)) because of their leadership roles on campus.

Duke's Campus Sustainability Committee includes the Executive Vice President of the University, the Vice Provost for Research, the Vice President of Facilities, and the Dean of the Nicholas School of the Environment (AASHE, 2011a). University of Colorado Boulder's Chancellor's Committee on Energy, Environment, and Sustainability includes the Vice Chancellor for Student Affairs, the Vice Chancellor for Administration, and the Vice Chancellor for Research (AASHE, 2011a). Having representatives like the deans of colleges and upper level administration on the campus sustainability committee may be helpful to JCSU in its sustainability planning process to create top-down buy-in of sustainability efforts and to serve as the voice of the University.

6.4.2.2.2 Faculty

Faculty from different departments will help to facilitate discussion and to contribute to the exchange of sustainability ideas. Faculty from areas like the sciences and business may also be helpful resource persons for technical aspects of the sustainability plan. Biology faculty may help to explain environmental phenomena and issues to other members of the committee. Meanwhile, business faculty members may help to explain different financing mechanisms for capital projects to reduce energy usage.

Having faculty from a variety of departments would be desirable because of the interdisciplinary nature of sustainability and environmental issues. Faculty members in psychology may help to contribute to discussions on strategies to encourage behavior change around environmental decision making. Of the AASHE STARS institutions with sustainability committees, 97.3% included faculty. Faculty who act as leaders of any departments or faculty bodies may also help to serve as the voices for other faculty members.

6.4.2.2.3 Staff

Staff members can serve as resource persons and provide helpful insight into University programming and operations. Staff in facilities management helped provide information and expert knowledge that contributed to this report in addition to both the Environmental Defense Fund report and Advanced Energy report previously on energy usage at Johnson C. Smith University. Some examples of other staff representation in sustainability committees include Babson College's Sustainability Steering Committee.

This Steering Committee includes not just members of facilities management, but also representatives from residential life, marketing, and purchasing (AASHE, 2011a). Of the AASHE STARS institutions with sustainability committees, 94.6% included university staff. Staff representing any part of campus programming can help to inform members of the sustainability committee about the ins and outs of campus operations.

6.4.2.2.4 Students

A university exists to serve and educate students; students are ideally part of any university sustainability committee. Johnson C. Smith states that its mission "is to provide an outstanding education for a diverse group of talented and highly motivated students from various ethnic, socioeconomic, and geographic backgrounds (JCSU, 2011). Because JCSU seeks to provide education to students, the University should make every effort to include students in the sustainability decision-making process.

Students may also serve as valuable resources to the sustainability committee. They are likely more in tune with the desires and behaviors of other students than faculty or staff. Johnson C. Smith's dormitories and student programming areas are some of the most energy-intensive buildings on campus.

Students may be able to contribute to the sustainability committee by providing insights into how to reduce energy usage in those buildings, for example. Of the AASHE STARS Institutions with sustainability committees, 86.5% included students. Some schools like Duke include representatives from sustainability groups while other schools include representatives from student governance organizations or students appointed because of their interests in sustainability.

For example, Babson College has representatives from the Graduate Student Association and the undergraduate Student Government Association (AASHE, 2011a). Because Johnson C. Smith University does not have a student sustainability group on campus, the University may want to include student leaders and also have students who are interested in sustainability issues submit applications

6.4.2.2.5 Community Members

Community members may bring additional insights based on their areas of expertise and their experiences in their communities. Including community members when possible is helpful for forming successful campus sustainability committees (Velasquez, 2006). Because Johnson C. Smith University has strong relationships with the neighborhood associations of neighborhoods in the Beatties Ford Corridor, JCSU may consider including some members from these communities in its sustainability committee.

JCSU could also include local decision makers or business people that are interested in sustainability at JCSU. Of the AASHE STARS institutions with sustainability committees, only 8.1% included community members in their committees. Because of JCSU's strong community connections, we recommend considering including community members. JCSU could help to set an example for other schools pursuing sustainability with strong community ties by including community members in the campus sustainability planning process.

6.4.2.3 Organizational Structure of Committees

6.4.2.3.1 Committee's Place in Organizational Structure of JCSU

Of the 37 AASHE STARS institutions with sustainability committees, at least 37.8% of the committees were directly under the purview of the president, chancellor, vice president, or provost of the universities. Some of the sustainability committees began as grassroots bottom-up efforts of select community members in different universities (AASHE, 2011a). Indeed, initiatives to "green" many campuses begin and grow as bottom-up approaches: students and staff request changes of their universities because of their desire to decrease the environmental impact of university activities (Beringer, 2006).

Nonetheless, in the opinion of some sustainability professionals, evidence of top-down buy-in to sustainability can help to create strong campus sustainability programs because decisions (Bucholz, pers. comm.). Thus, we recommend that JCSU consider having the sustainability committee directly report to the President or one of the University Vice Presidents.

6.4.2.3.2 Committee Organizational Structure

We recommend that Johnson C. Smith University structure its campus sustainability committee in such a way to encourage collaboration and effective communication. Cross-functional groups are groups needed when tasks are complex and information is uncertain. Representatives from different groups then need to communicate with one another to look at each other's information and to make decisions together (Lorsch, 1987).

In the simplest organizations, decisions will be coordinated by direct supervision, having the person in charge give direct orders to the group. These institutions are hierarchical in nature. Committees and organizations that exhibit a divisionalized form of organization have separate independent units where the heads of subgroups have the most control Complex committees and organizations that require specialists to combine efforts in working group teams and to mutually adjust their decisions have a strategic structural referred to as an **adhocracracy** (Mintzberg, 1980).

Some institutions have more hierarchal structures with committee chairs and executive committees that approve the actions of other committees. An example of such an approach is the University of Houston- University Park. The University of Houston-University Park has Policy and Planning Committee and an Education and Marketing Committee that report to the Executive Committee of the Sustainability Task Force (AASHE, 2011a).

Some institutions show the divisionalized approach, having sub-committee chairs that report to the main campus sustainability committee that has a flat organizational structure. These sub-committee chairs speak to the entire committee and thus have a great amount of power (Mintzberg, 1980). New York University's Sustainability Task Force has eight smaller committees within the task force, each chaired by a student and a faculty member (AASHE, 2011a).. Each of these teams then reports to the Executive Committee (AASHE, 2011a).

Other institutions have working groups that appear to exist in an adhocractic or matrix structure, each working group holding an important and equal place in relation to the other working groups or sub-committees. In an adhocracy, leadership is not uniformly concentrated. Experts and leaders are present where their expertise and leadership are

needed within the organization (Mintzberg, 1980). An example of this approach is Babson College's Sustainability Steering Committee. Babson has working groups for Facilities Management and Planning, Dining Services, Purchasing, Transportation, and Marketing. Babson College then includes experts from certain parts of the institution in those smaller working groups to help take advantage of the knowledge of those individuals.

For example, Babson's Director of Purchasing serves on the Purchasing Committee (AASHE, 2011a). Adhocracy can help encourage innovation and collaboration (Mintzberg, 1981). Innovation and collaboration will be important to JCSU's sustainability planning, so JCSU should seriously consider having an adhocracy that gives power to experts and that encourages communication among working groups. Johnson C. Smith should consider whether it wants its committee to have a more hierarchical, divisional, or adhocractic organizational structure as the University forms its sustainability committee.

6.4.2.3.3 Committee Components

JCSU may find it beneficial to organize University sustainability plans around different goals or to have subcommittee groups that meet and develop strategies for certain areas of interest outside of general body meetings. Of the thirty-seven AASHE STARS reporting institutions that had sustainability committees, 46.0% had clear information on the AASHE website or on directly linked websites indicating that they had sustainability committee subcommittees or working groups or areas of focus within their sustainability committees

JCSU may want to organize its committees in different ways. We describe some exemplars of different approaches below. The institutions with clearly delineated subgroups, working committees, or areas of focus are provided in the Table 1 for the reference of the University.

Subcommittees or working groups can be organized around broad actions that will encompass different areas of sustainability. Goshen College has its Ecological Stewardship Committee broken into groups for Advancement, Audit, Analysis, and Awareness. Santa Clara University's Sustainability Council has smaller working groups for Stewardship, Education, and Outreach. The St. John's University Sustainability Committee has its efforts focused around the areas of Environmental Stewardship, Environmental Education, and Environmental Service (AASHE, 2011a).

In contrast, JCSU alternatively may decide to make subcommittees or working groups for areas of sustainability that are of particular interest to JCSU or that JCSU wants to address immediately such as buildings and energy usage and waste reduction. Duke University's Campus Sustainability Committee has several subcommittees including Education, Transportation, Carbon Offsets, Communication, and Energy (Duke University, 2009). The University of Florida has subcommittees for Zero Waste, Energy & Climate Change, Education & Research, and the Sustainability Conference (AASHE, 2011a).

The University of Florida is an example of a Campus Sustainability Committee with a subcommittee for a specific program, the Sustainability Conference. If JCSU decides to create programs to promote sustainability that require significant effort and time, the University may want to have a subcommittee for these programs.

Institution	Subcommittees of Campus Sustainability Committee
Babson College	Facilities Management and Planning, Dining Services, Purchasing, Transportation, Marketing
College of Lake County	Waste, Transportation, Buildings-Energy-Water, Native Landscaping, Human Resources-Education, Curriculum
Duke University	Education, Transportation, Carbon Offsets, Energy, Communication
Estrella Mountain Community College	Education & Research; Operations; Planning, Administration, & Engagement; Student Sustainability Club
Goshen College	Advancement, Audit, Analysis, Awareness
Indiana University Bloomington	Academic Initiatives, Energy & Built Environment, Environmental Quality & Land Use, Food, Resource Use & Recycling, Sustainable Computing, Transportation
New York University	Energy and Water; Food, Purchasing, and Waste; Transportation; Green Building and Planning; Outreach and Engagement; Environmental Assessment; Green Grants; Academic Initiatives
Santa Clara	Stewardship, Education, Outreach
St. John's University	Environmental Stewardship, Environmental Education, Environmental Service
SUNY Fredonia	Energy, Transportation
UC Colorado Springs	Campus Greening, Food, Curriculum
University of Florida	Zero Waste, Energy & Climate Change, Education & Research, Sustainability Conference
University of Houston-University Park	Executive committee, Policy and Planning Committee, Education and Marketing Committee
University of Illinois at Chicago	Recycling and Waste Management, Energy and Utilities, Transportation, Grounds
University of Louisville	Education and Research; Operations; and Administration, Finance, & Outreach
University of South Florida	Research, Water, Energy, Green Building, Climate Commitment, Greenhouse Gas Emissions, Campus, Transportation, Alumni & Outreach, Marketing & Promotion, Curriculum, and Recycling, Waste Management, & Purchasing
University of Texas Arlington	Building and Development; Administration and Outreach; Climate; Curriculum, Research, and Community Engagement; Dining Services; Energy and Water; Landscape and Habitat; Management Systems; Purchasing; Transportation; Waste Reduction

Table 1: AASHE STARS reporting institutions with subcommittees or working groups within larger sustainability committees (AASHE, 2011b)

6.5 Hiring a Campus Sustainability Staff Person

6.5.1 Background and Methods

Based on current staffing available for sustainability activities, and on the staffing needs to accomplish the generation of a sustainability plan and the implementation of the plan's goals, we recommend that JCSU hire a full-time sustainability staff person. The goal of this position is to assist the University in the development of programs in a holistic, systematic way that is efficient, cost-effective and makes the best business sense for Johnson C. Smith's unique issues.

To reach this recommendation, students assessed JCSU's current staffing structure, reviewed primary literature on campus sustainability, and conducted multiple interviews with staff at three peer institutions—Duke University, University of North Carolina at Charlotte, and Vanderbilt University. Students also researched publications on strategic planning and adaptive management in other settings. Of particular use was "A Practical Guide to Hiring a Sustainability Professional for Universities and Colleges" composed and published by the Campus Consortium for Environmental Excellence (2006).

Additionally, students used analysis of the results of two assessment systems for campus sustainability (AASHE STARS and the College Sustainability Report Card) to analyze the potential for hiring a full-time sustainability staff person and to judge the effectiveness of hiring sustainability staff at peer institutions.

6.5.2 Recommendations

Hiring a sustainability staff person should be a mid-term goal of Johnson C. Smith University as the University seeks to become a sustainable campus. For both the AASHE STARS and Campus Sustainability Report Card, a significant proportion of the schools studied had at least one sustainability staff in their sustainability office. Specifically, 84.6% of the AASHE STARS reporting institutions have sustainability staff (AASHE, 2010a); 75.2% of the Campus Sustainability Report Card rated institutions have sustainability staff.

Of the Campus Sustainability Report Card rated institutions with grades of B and higher, 91.2% had sustainability staff. Moreover, two of the Duke Endowment legacy schools have fulltime sustainability staff. Thus, JCSU has exemplar peers to learn from when hiring its own sustainability staff. The high correlation between campus sustainability performance

and sustainability staff emphasizes the necessity for Johnson C. Smith to put high priority on creating such a position and on hiring someone to work as sustainability staff.

We understand, and recommend, that instituting a university sustainability program will take time to be fully realized; however, we believe that hiring a sustainability staff person should be a top priority. Our specific recommendations below are based largely on "A Practical Guide to Hiring a Sustainability Professional for Universities and Colleges," published by AASHE.

6.5.2.1 Position Duties and Responsibilities

The scope of the position can vary, as is shown by the variety of job descriptions that are found on the AASHE website (AASHE, 2011g). Some possible qualifications and duties are detailed below, which we have created after examining other job descriptions and after considering JCSU's specific needs. Appendix B includes a job description for Duke's Director of Sustainability. Some of the possible duties for sustainability staff include the following:

A) Streamline and expand operation of the campus recycling program in coordination with Facilities administration, staff, and involved student groups
    - Monitor recycling pickup from all campus locations
    - Coordinate with Facilities employees who are involved in recycling and waste disposal duties
    - Assess the effectiveness of the current recycling system
    - Design and implement system improvements in infrastructure and logistics
    - Evaluate the current contract with recycling haulers and work to improve as necessary
    - Oversee and monitor work-study students will be assisting with recycling pickup
    - Oversee and coordinate recycling at university athletic events and university-sponsored events
    - Evaluate the carbon emissions associated with recycling efforts and work to decrease these as possible
B) Coordinate with university departments, administrators, staff, and students to decrease campus energy consumption, increase energy efficiency, and increase conservation of water and other resources

- Coordinate with current Facilities leadership staff Anayochbukwu Ezeigbo and Andy Berry to reduce energy usage and carbon emissions through continued infrastructure improvements
- Design and implement energy conservation education programs, signage, and information sharing for residential, class, and office buildings
- Plan and implement energy conservation awareness program for university staff and faculty members

C) Increase formal energy conservation education programs and methods across campus, especially focused on the student body
- Collaborate with SGA and Housing to plan and implement education and awareness programming and events in residence halls, especially the Eco-Reps program
- Coordinate with academic and staff personnel and departments to implement recycling and energy awareness initiatives in academic and office
- Design a comprehensive environmental/sustainability education program, focusing on energy conservation, conservation and reuse of resources, and proper participation in the campus recycling system, to be integrated into the new student orientation program
- Manage the Eco-Representatives program

D) Work with other leaders in the university and community who are working on sustainability-related issues
- Assist in creating, monitoring, and analyzing indicators of the environmental impacts of university activities, including utilities, garbage, recycling tonnage, and carbon emissions
- Collaborate with staff and administrators who are working on campus sustainability issues, including publicity efforts and the upcoming website
- Maintain open channels of communication with SGA, other student environmental/ sustainability organizations, and the surrounding 12 neighborhoods

E) Act as the catalyst for activity and commitment to sustainability
- Identify opportunities for continuous environmental improvement and implement programs to deliver these

- Promote and coordinate the integration of environmental and sustainability initiatives into policies, rules, products, services and operations
- Make the institution perform more efficiently and therefore more competitively, which in turn promotes environmental and social improvements.
- Connect with and support the academic mission by engaging students and faculty in the environmental and social performance of the institution, and by using the campus as a living laboratory.

6.5.2.2 Position Reporting Structure and Remuneration

The next steps are to determine the reporting level and lines and to determine the salary remuneration. With respect to the former topic, the department within which the sustainability professional works can greatly affect his/her roles, responsibilities and influence. For instance, if the sustainability staff person is housed in President's office, he or she may impact executive decisions such as procurement policies and student curriculum whereas the sustainability staff person housed in the facilities department may focus on energy efficiency for existing buildings and managing operations like recycling, waste management, and water consumption.

Figure 3 from AASHE's "Higher Education Sustainability Officer Position and Salary Survey" (AASHE, 2008), indicates the distribution of where sustainability staff is housed from the AASHE study. This data is from a survey that builds off of the 2005 survey from Education for Western Sustainability Network. Tables 2 and 3 show the salary distribution of sustainability professionals surveyed who have advanced degrees and who do not have advanced degrees, respectively.

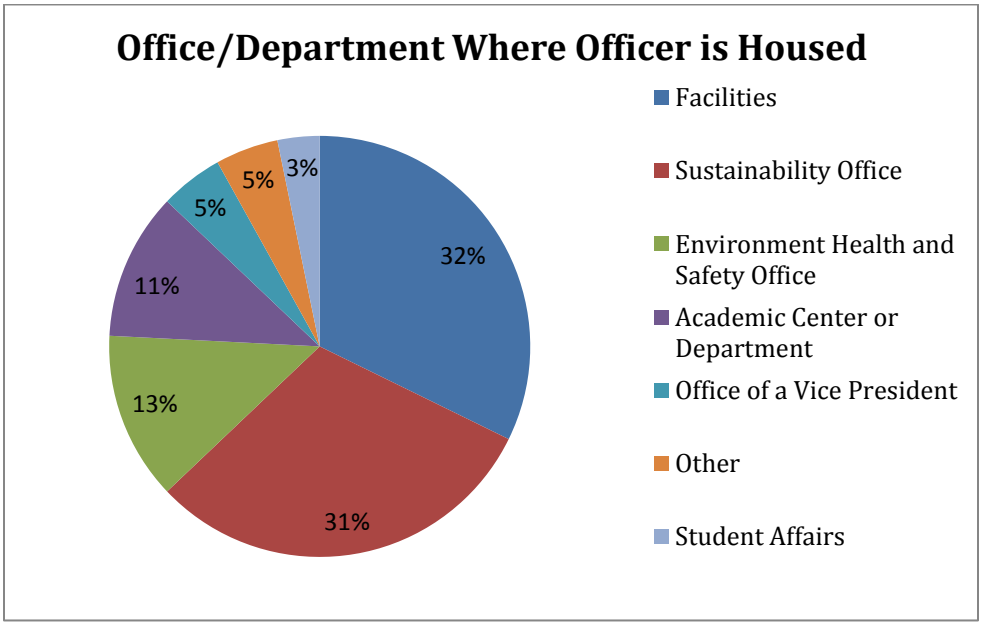

Figure 3: From a survey by Education for Sustainability Western Network of campus sustainability professionals' salaries in 62 U.S. colleges and universities, the chart indicates that 63% of professionals are housed in Facilities or their own Sustainability Office, 24% are housed in Environmental Health & Safety Office or Academic Center, and the remainder are housed elsewhere (AASHE, 2008)

With Advanced Degrees (MS, MBA, JD, PhD):			
Years of Experience	Number of Individuals	Average Salary	Standard Deviation
0 to 5	5	$ 41,500	$ 8,900
6 to 10	5	$ 51,500	$ 10,200
11 to 20	6	$ 81,800	$ 26,400
More than 20	4	$ 52,000	$ 13,400

Table 2: From a survey by Education for Sustainability Western Network of campus sustainability professionals' salaries in 36 U.S. colleges and universities, the table indicates that professionals with more years of experience and with advanced degrees tend to earn higher salaries on average (EFS-West, 2005)

Without Advanced Degrees:			
Years of Experience	Number of Individuals	Average Salary	Standard Deviation
0 to 5	8	$ 34,000	$ 6,200
6 to 10	3	$ 48,700	$ 3,800
11 to 20	5	$ 52,000	$ 12,500

Table 3: From a survey by Education for Sustainability Western Network of campus sustainability professionals' salaries in 36 U.S. colleges and universities, the table indicates the salaries of sustainability professionals without advanced degrees. These professionals have higher salaries as their years of experience increase, on average (EFS-West, 2005)

Care should be given in regards to who will "line manage" the individual; and, the Sustainability Committee may want to consider a "stakeholder" analysis and develop an organizational management plan. With respect to the latter topic, the salary of the sustainability staff would be a function of his or her duties, cost of living in Charlotte, equivalent earnings at other institutions, and years of experience and other personal qualifications. The findings from a survey of campus sustainability professionals conducted by Education for Sustainability Western Network (shown below) provide a useful starting place (EFS-West, 2005).

We recommend that the sustainability staff person should be housed within his or her own sustainability office and should report to President Carter. The reason for this is that the recommended responsibilities of the position cut across departments and affect many different aspects of the campus, such that the staff person needs to have the authority beyond the scope of the traditional departments at JCSU.

In addition, we recommend that the staff person be a professional seasoned in sustainability in higher education. We recommend a starting salary around $50,000. Because JCSU is just beginning to foster a spirit of sustainability and implement many strategies all across campus, the sustainability staff will be responsible for making these changes to sustainability a reality. Thus, the ideal sustainability staff person for JCSU would be a professional with more than five years of experience of managing, implementing, and evaluating such programs. This person could share her previous experience and more easily steer the University to its intended endpoint. Based upon the result of the survey from the Education for Sustainability Western Network, such a professional, with or without an advanced degree, will likely require a starting salary around $50,000.

6.5.2.3 Position Alternatives

Although they are less optimal, alternatives to a full-time, paid sustainability staff may be possible for JCSU. One alternative is a temporary staff position that would perform many of the functions of the sustainability staff and would gather and analyze data in order to recommend the exact duties, qualifications, and costs requisite for a full-time staff. This method was adopted for at least one of JCSU's peer institutions. Specifically, Vanderbilt University hired a full-time temporary recycling coordinator.

During the spring term of 2007, Jennifer Hackett was hired as an interim recycling coordinator for four months and reported to Plant Operations, where she spent most of her time managing the nascent recycling program for residence halls, academic departments, and administrative offices and spent her remaining time identifying the roles and responsibilities for a permanent position (Hackett, 2010). This alternative may be recommended if Johnson C. Smith University wants to gather more information on such a position while simultaneously some sustainability strategies are being implemented in the near term.

Another option is to create a short-term, fixed-period, rotating fellowship. Davidson College follows this model. The Davidson fellow's responsibilities include administering the President's Climate Commitment, developing on-campus initiatives (e.g. alternative energy), collaborating with students on environmental programming, and connecting with the community and other schools on sustainability projects (Davidson College, 2011).

Johnson C. Smith University could hire a recent JCSU graduate for a two-year fellowship. The JCSU fellow would fulfill most of the duties and tasks of a sustainability staff for two years. At the end of the two-year period, the University could hire a new recent JCSU graduate for the same type of fellowship. A fellowship program may make funding the work of a sustainability staff more affordable and may help the University retain a solid base of working knowledge for the betterment of the campus sustainability program.

6.6 Sustainability Strategies

Our team proposes the following components for the newly formed sustainability committee to consider in the development of Johnson C. Smith's inaugural campus sustainability plan: reduction of energy use in buildings, recycling, dining, and education and awareness (including competitions, an environmental representatives program, and a logo and slogan contest). This list is not exhaustive; however, we recommend that JCSU include these areas in its sustainability plan because making improvements in these areas can help to create high impact changes in JCSU's environmental sustainability. We will make recommendations on the aforementioned proposed components in this section.

6.6.1 Reduction of Campus Greenhouse Gas Emissions

JCSU has a high interest in reducing energy usage through conservation and increased energy efficiency. To create a baseline for Johnson C. Smith University to evaluate its current greenhouse gas footprint from its built environment and operations, our team conducted a greenhouse gas inventory. The results of this inventory and recommendations for reduced energy usage are included in the following section. Because most of JCSU's emissions originate from building energy usage and because of the University's stated interest in this area, we will spend the most attention on strategies that reduce greenhouse gas emissions and building energy use.

6.6.1.1 2011 Greenhouse Gas Inventory

6.6.1.1.1 Methods of Conducting a Greenhouse Gas Inventory

In 2011, our team undertook an inventory of greenhouse gas (GHG) emissions at Johnson C. Smith's campus using data available from 2009 and 2010 to discern the current level of greenhouse gas emissions on campus. We used Clean-Air Cool-Planet Campus Carbon Calculator software complete this analysis. Clean-Air Cool-Planet (CA-CP) is a non-partisan, scientifically-focused 501(c) 3 non-profit organization. CA-CP strives to meet its mission of solving the global warming problem in part by helping to reduce the carbon dioxide emissions of companies, communities, research centers, and colleges and universities (Clean-Air Cool-Planet, 2011a).

Clean-Air Cool Planet provides the Campus Carbon Calculator tool free of charge to institutions of higher education to help measure and analyze college and university greenhouse gas emissions. We chose to complete our analysis using the Campus Carbon Calculator because this tool is the greenhouse gas inventory method most widely used by institutions of higher education in the United States; more than 1200 colleges and universities, including Duke, have used the Carbon Calculator to help calculate campus emissions (Clean-Air Cool-Planet, 2011b; Duke University, 2009). We determined the emissions of greenhouse gases from different source through using the Clean-Air Cool Planet Campus Carbon calculator tool. The Campus Carbon Calculator converts emissions of all greenhouse gases into carbon dioxide equivalents (CO_2e).

6.6.1.2 Definition of Emission Sources and System Boundaries

6.6.1.2.1 System Boundary

The boundary used for the greenhouse gas inventory for Johnson C. Smith University was the main campus in Charlotte. Other University-owned buildings not on campus, such as the President's house in Myers Park, were not included in this analysis.

6.6.1.2.2 Standard for Emission Sources and Scope

The GHG Protocol Corporate Accounting and Reporting Standard (GHG Protocol Corporate Standard) was a source for determining emissions sources and types of greenhouse gases measured. The GHG Protocol Corporate Standard is a source widely adopted by players in the public, private, and non-profit sectors to measure their greenhouse gas emissions.

The GHG Protocol Initiative, a partnership formed by the World Resources Institute and the World Business Council for Sustainable Development, developed this standard (Ranganathan et al, 2004). The standard gives guidelines for measuring and reporting the six greenhouse gases mentioned by the Kyoto Protocol as follows: carbon dioxide (CO2), sulfur hexafluoride (SF6), perfluorocarbons (PFCs), nitrous oxide (NO2) and methane (CH4) (Ranganathan et al, 2004).

6.6.1.2.3 Emission Sources

Greenhouse gas inventories can calculate emissions released directly or indirectly by the University. All direct emissions and electricity and heating should be accounted for under the GHG Protocol (Ranganathan et al, 2004). Some indirect emissions from other sources, such as… may be calculated so that the University can better understand its carbon footprint. The types of emission sources and the emissions calculated for the JCSU emissions inventory are explained below. In addition, Table 4 shows the types of emissions and sources of data for each emissions source.

Scope 1 emissions are emissions that an institution owns and controls directly. Emissions from furnaces, on-campus power generation, and emissions from University vehicles should be included in Scope 1 (Ranganathan et al, 2004). For the JCSU emissions inventory, the Scope 1 emissions were calculated by determining the gasoline usage of

campus fleet vehicles and gasoline usage of various University departments from University gas cards. The emissions were calculated by dividing the purchase prices of gasoline by monthly retail gasoline averages for the Southeast region from the Energy Information Administration (EIA).

Scope 2 emissions are emissions from purchased electricity and heating consumed by an institution (Ranganathan et al, 2004). JCSU purchases all of its electricity from Duke Energy and heats its buildings mainly from natural gas purchased from Piedmont Natural Gas. Scope 2 emissions were calculated by entering the electricity in kilowatt hours (kWh) used by JCSU each year through its electricity accounts and outdoor lighting accounts and the therms (100,000 BTUs) of steam used each year from natural gas accounts.

When calculating the emissions of electricity, emissions factors must be included. Emissions factors convey the amount of greenhouse gases electricity generation releases. For example, electricity in an area that generates electricity mainly from coal-fired power plants will have a higher emissions factor than electricity generated in an area with a higher percentage of nuclear generation. For this GHG inventory, the emissions factor was calculated using the regional emissions factor for North Carolina power in the CA-CP spreadsheet.

Scope 3 emissions need not be included under the strictest definition of a greenhouse gas inventory. Scope 3 emissions are defined as emissions that occur as a consequence of institutional activity but that the institution does not directly control or own (Ranganathan et al, 2004). Some examples of Scope 3 emissions include use and disposal of products and services sold, purchase materials production, employee commuting, employee air travel, and solid waste disposal (Ranganathan et al, 2004 and Duke University, 2009). For the JCSU greenhouse gas inventory, solid land-filled waste data were included in Scope 3 emissions.

These data were included because of the University's expressed interest in increasing recycling and improving waste management. By including the effects of landfilled waste, this report will help the University more fully understand the impacts of its current waste practices. Scope 3 emissions also include transmission and distribution losses of electricity.

Scope 1 Emissions	
Emissions Source	**Source of data**
Fleet vehicle usage	Campus gas card data
Scope 2 emissions	
Emissions Source	**Source of data**
Duke Power electricity usage	Bills for energy usage for buildings, bills for outdoor lighting
Piedmont Natural gas usage	Natural gas bills
Scope 3 emissions	
Emissions Source	**Source of data**
Land-filled waste	Bills for landfill tipping fees

Table 4: Table showing emissions sources and where data was obtained for each emissions source

6.6.1.3 Background on Past Energy Work

Over the past two years, a representative from Advanced Energy and a business intern from the Environmental Defense Fund both conducted analyses on JCSU campus energy usage and composed reports detailing recommendations for the University on energy conservation measures. Additional independent quantitative analyses on energy efficiency projects and on the energy usage of specific buildings are not included in this report because of concern of simply replicating recent analysis and not providing the University with new insights into reducing campus energy usage.

Instead, we used calculations from both the Advanced Energy and Environmental Defense Fund reports to conduct further analysis and to make recommendations in context of the Clean-Air Cool-Planet greenhouse gas emissions inventory. The team also used data from the Advanced Energy report to calculate energy usage in 2008 and to make comparisons of JCSU's energy intensity and emissions to regional institutions. Data from the EDF report on the capital costs and energy benefits of energy efficiency projects helped us make recommendations on prioritizing projects to reduce Scope 2 emissions.

6.6.1.3.1 Inventory Results

In 2009, University transportation was responsible for about 196.2 MT CO_2e Scope 1 emissions. In 2010, University transportation was responsible for emitting greenhouse gases equivalent to 173.7 metric tons of carbon dioxide (see Figure 4). Connecticut College, a small college in New London, Connecticut with a campus of similar size to Johnson C. Smith University's campus and a comparable student body has Scope 1 emissions of mobile sources from fleet vehicles as 245 MT CO2e (Zuar, 2009).

The vast majority of University greenhouse gas emissions occur in Scope 2. Purchased electricity in 2009 was responsible for emitting 5920.5 metric tons of carbon dioxide equivalents. In 2010, purchased electricity emitted greenhouse gases equivalent to 6237.1 metric tons of carbon dioxide. Natural gas for production of purchased steam contributed to the equivalent of 1530 metric tons of carbon dioxide in 2009 and 1800 metric tons of carbon dioxide in 2010. Total Scope 2 emissions were equivalent to 7450.5 metric tons of carbon dioxide in 2009 and 8030.6 metric tons of carbon dioxide in 2010.

Scope 3 solid waste contributed to the equivalent of 578 metric tons of carbon dioxide in 2009 and 535 metric tons of carbon dioxide in 2010. Total Scope 3 emissions including transmission and distribution losses were 1294 MT CO_2e and 1299 MT CO_2e in 2009 and 2010, respectively.

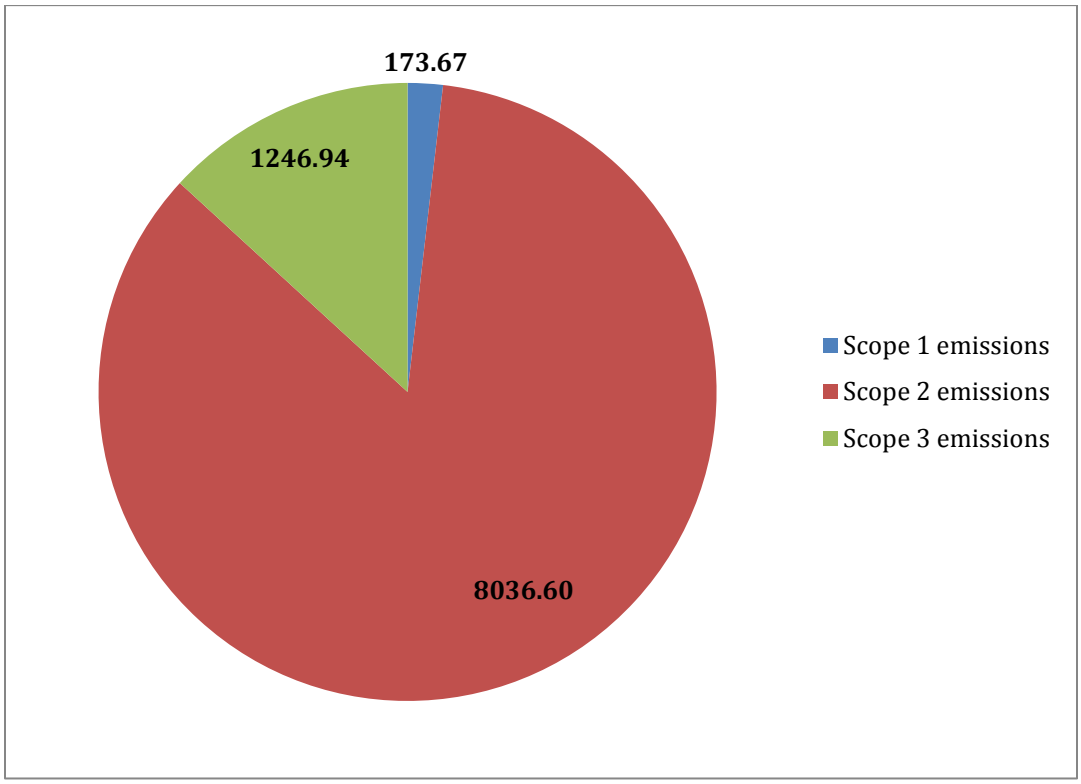

Figure 4: Relative amount of Scope 1, Scope 2, and Scope 3 emissions from JCSU in 2010, MT CO_2e

6.6.1.3.2 Emissions at a Glance

The energy use intensity values calculated from energy data provided by JCSU in 2009 and 2010 varied somewhat from the values calculated by the Advanced Energy report but are relatively comparable. Figure 5 shows the intensity of JCSU's energy usage as compared to the regional average for institutions of higher education. Electricity intensity (measured in kBTU per square foot) was lower in 2009 and 2010 than the intensity that Advanced Energy reports. Natural gas intensity (also measured in kBTU per square foot) was very close to Advanced Energy's reported value in 2009, but 15.5% higher in 2010. Fuel intensity may change each year depending on heating and cooling needs.

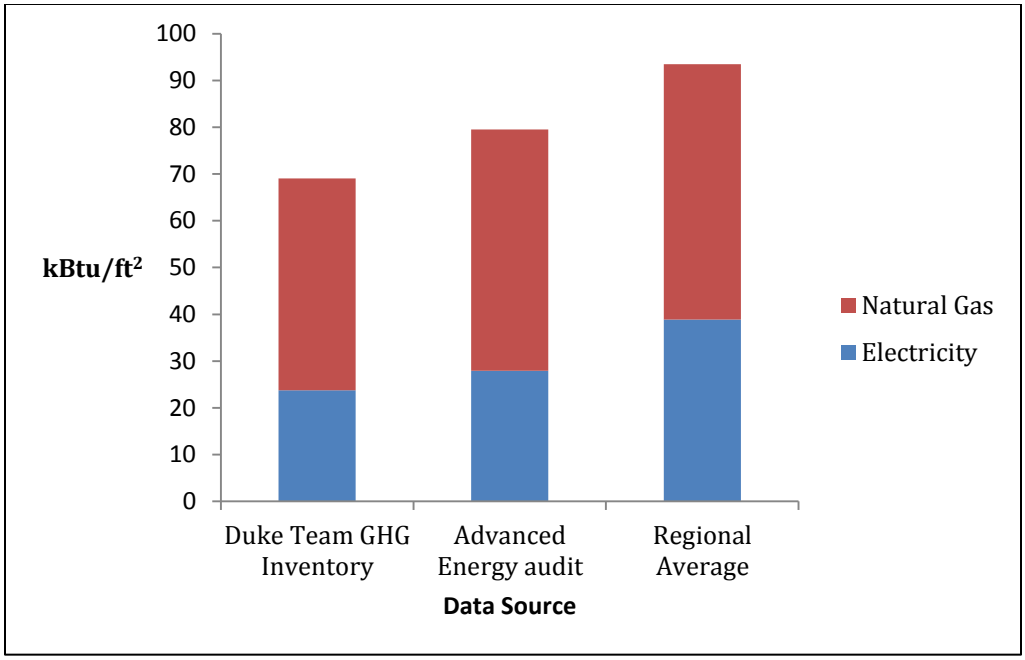

Figure 5: Energy intensity in 2008 in comparison to values calculated by Advanced Energy and the regional average values as reported by EIA

Although the inputs of energy for the Clean-Air Cool-Planet model had similar energy intensities and although the natural gas usage calculated in 2011 was somewhat similar to the total natural gas usage calculated by Advanced Energy, the emissions that we calculated using Clean-Air Cool-Planet and the emissions Advanced Energy calculated differed dramatically. Advanced Energy may have only calculated carbon dioxide emissions for electricity and natural gas usage, but not greenhouse gas emissions including carbon dioxide (CO_2), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), nitrous oxide (NO_2) and methane (CH_4).

We found it difficult to make direct comparisons to the Advanced Energy study on emissions because the report only mentions carbon dioxide emissions in its analysis of greenhouse gas impact and does not outline the methods used to calculate greenhouse gas emissions (Welch, 2009). Advanced Energy's calculations for emissions per kWh and per therm are similar to the emissions of CO2 per kWh and emissions of CO_2 per therm calculated by the CACP model.

As shown in Figure 6 below, The emissions of total greenhouse gases calculated by CACP are much higher than the emissions calculated by Advanced Energy It is possible that Advanced Energy used a different emissions factor from the regional emissions factor that we used. We have tried to contact Advanced Energy auditor Dan Welch to clarify his methods and to gain insights on the discrepancy between our calculated emissions values and his, but have been unable to reach him thus far.

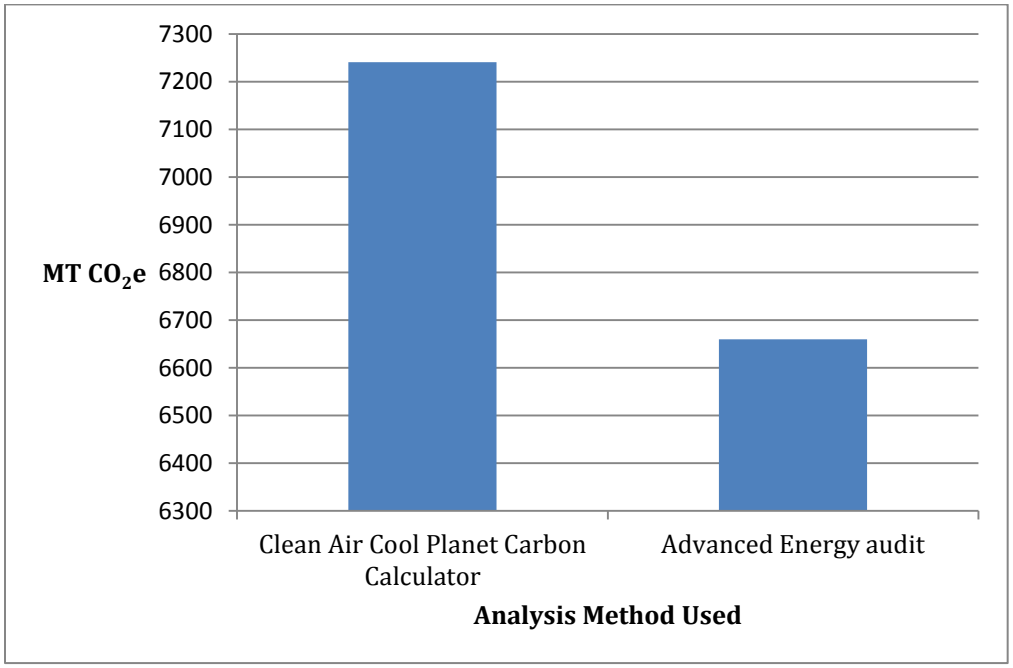

Figure 6: Advanced Energy calculated Scope 2 emissions in 2008 versus Scope 2 emissions calculated from Clean Air Cool Planet using 2008 data

Sustainability auditing, including auditing of greenhouse gas emissions, can help Johnson C. Smith University to measure its sustainability efforts and to prioritize projects on campus. Continuing with this discussion of sustainability strategies, we will next move to campus sustainability initiatives on campus.

6.6.1.4 Recommendations

6.6.1.4.1 Reducing Scope 1 Emissions

In 2009 and 2010, emissions from University fleet vehicles and University purchased gasoline were only about 2% of JCSU's entire greenhouse gas footprint. Nonetheless, JCSU can still reduce Scope 1 emissions from transportation sources. A campus sustainability committee should decide on further steps, but some suggestions for reducing emissions from transportation are listed as follows:

6.6.1.4.1.1 Short-Term

Recommendation: Create efficiency policies for fleet vehicles i.e. requiring fleet vehicles that are purchased to replace retired vehicles to have higher MPG efficiency ratings. The Duke University Campus Sustainability Committee recommended in its Climate Action Plan that the University have a "Green Policy" for purchasing fleet vehicles (Duke University, 2009).

Recommendation: Conserve gasoline by encouraging University community members to use the smallest and most efficient vehicles they can for University-sponsored travel

6.6.1.4.1.2 Long-Term

Recommendation: Replace facilities golf carts with electric carts (Yee, 2009).

6.6.1.4.2 Reducing Scope 2 Emissions

In both 2009 and 2010, Scope 2 emissions from purchased electricity and heating fuel accounted for more than 80% of greenhouse gas emissions. Thus, the largest opportunity for reducing greenhouse gas emissions is through reducing electricity and natural gas usage. Johnson C. Smith can help to reduce greenhouse gas emissions through energy efficiency upgrades and by encouraging energy conservation among University staff, faculty, and students.

The University already has a wealth of information and suggestions for energy efficiency projects from both the Advanced Energy report and the Environmental Defense Fund report. Some of the recommendations from these reports, such as sub-metering of buildings for electricity, have already been completed at JCSU.

6.6.1.4.3 Energy Efficiency Projects and Energy Conservation

Two reports in the past two years have made extensive recommendations for improving energy efficiency and for reducing greenhouse gas emissions. A summary of energy efficiency projects and energy conservation measures as recommended by the Advanced Energy study and the Environmental Defense report are included in the tables below. Short-term, mid-term, and long-term recommendations are shown in Table 5, Table 6, and Table 7, respectively.

Action Recommended	Report Recommending Action
Removing vending machine lighting in well-lit areas	Advanced Energy, Environmental Defense Fund
Raising energy awareness and educating University community members about ways to conserve energy	Advanced Energy, Environmental Defense Fund
Managing computers to run on energy conserving settings	Advanced Energy
Controlling outdoor lighting so lights are not on during daylight hours	Advanced Energy
Shutting down the Band Annex building	Advanced Energy, Environmental Defense Fund
Sub-metering of JCSU buildings	Environmental Defense Fund
Moving residents to concentrate residence halls during the summer	Environmental Defense Fund
Create an Energy Star purchasing policy	Environmental Defense Fund

Table 5: High priority/short-term recommendations for decreasing energy usage and the source of each recommendation. High priority recommendations require little or no capital expenditure from Johnson C. Smith University.

Action Recommended	Report Recommending Action
Installing a hot water tank in the gymnasium	Environmental Defense Fund
Installing programmable thermostats in buildings	Advanced Energy, Environmental Defense Fund
Installing lighting occupancy sensors in bathrooms and classrooms	Advanced Energy, Environmental Defense Fund
Retrofitting T12 fluorescent lights to T8	Advanced Energy, Environmental Defense Fund
Buying computer power management software	Environmental Defense Fund
Regulating vending machine power through VendingMiser software	Environmental Defense Fund
Replacing exit sign fluorescent lights with LED lights	Environmental Defense Fund

Table 6: Mid-term recommendations for decreasing energy usage and the source of each recommendation. Short-term recommendations require JCSU to make moderate capital investments; however, these projects have short payback periods.

Action Recommended	Report Recommending Action
Weatherization and refurbishing	Advanced Energy, Environmental Defense Fund
Initiating a preventative maintenance program	Advanced Energy, Environmental Defense Fund
Upgrading HVAC equipment	Advanced Energy, Environmental Defense Fund
Installing a frictionless chiller	Environmental Defense Fund
Installing a Building Automation System	Advanced Energy, Environmental Defense Fund
Retrofitting gym lighting	Advanced Energy, Environmental Defense Fund
Replacing fluorescent lighting with LED lighting	Environmental Defense Fund
Installing dorm window sensors	Environmental Defense Fund
Installing district heating systems	Advanced Energy
Using fuel optionality	Advanced Energy

Table 7: Long term recommendations for decreasing energy usage and the source of each recommendation. Long-term recommendations require JCSU to make significant capital investments.

JCSU should prioritize projects that maximize greenhouse gas reductions at a cost benefit to the institution such as removing vending machine lights and installing occupancy sensors in classrooms and bathrooms (Yee, 2009). Educating students and employees about energy conservation methods may help to reduce emissions due to electricity and heating use. Students and faculty members also care a great deal about energy use, as evidenced by the results of the Go Green Survey conducted in fall of 2010.

The cost of hiring a full-time staff member could be completely offset with savings from the execution of energy-efficiency projects. Of the energy efficiency improvements suggested in the EDF Report with a payback period of less than one year, we found that the combined net present value of these projects is approximately $184,454. These energy savings could more than offset the hiring of a campus sustainability staff person at Johnson C. Smith University.

Using the energy savings numbers and capital costs for projects from the Environmental Defense Fund paper and the emissions factor assumptions from Clean Air Cool Planet, we created a marginal cost of greenhouse gas mitigation curve to show how JCSU can reduce Scope 2 emissions at different price points. In Figure 7 below, marginal cost of carbon dioxide abatement (dollars per ton of carbon dioxide abated) can be found on the y-axis. Tons of carbon dioxide abated is indicated on the x-axis.

To make this chart, our team calculated the net present value of projects after 1 year and the tons of carbon dioxide that would be abated after one year. Both carbon emissions and revenue from energy savings were valued using a 20% discount rate. Projects with bars below the x-axis will reduce carbon dioxide emissions at a cost savings to the University in one year. Projects with bars above the x-axis will reduce carbon dioxide emissions of the University, but will require higher capital investments and therefore cost the University money over the course of one fiscal year.

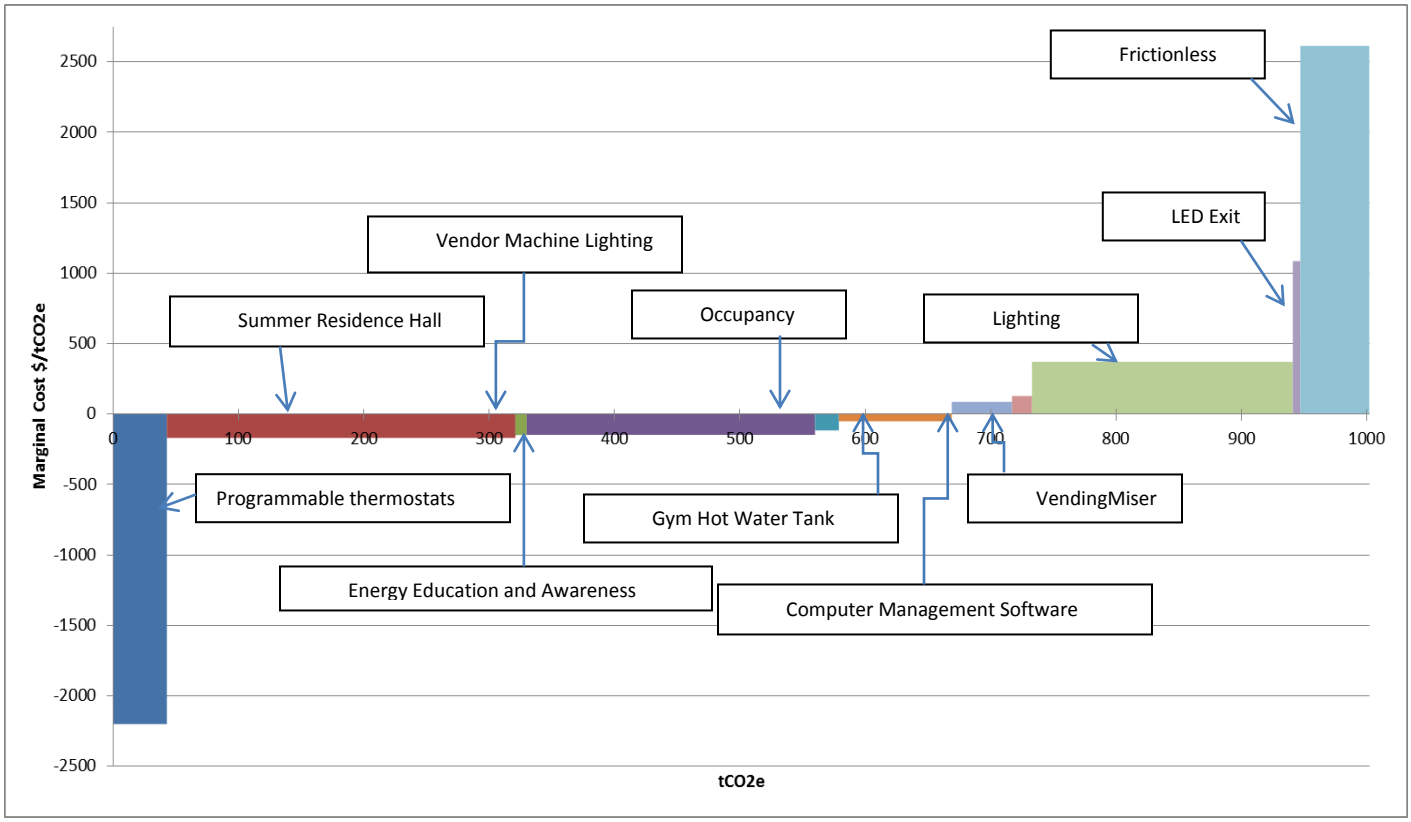

Figure 7: Greenhouse gas abatement curve showing the abatement of greenhouse gases plotted versus cost per metric ton of carbon dioxide reduced.

6.6.1.4.4 Reducing Scope 3 Emissions from Solid Waste

Solid waste contributed to 6.5% of Johnson C. Smith University's greenhouse gas footprint in 2009 and 5.7% of greenhouse gas emissions in 2010. Significant improvements could be made in solid waste disposal. This is an area of high interest to students and employees of the University who answered the Go Green Survey in fall of 2010. Some of the students, staff, and employees specifically voiced their concerns about the lack of widespread recycling on campus.

A composting program could help reduce compostable waste that is sent to the landfill. Although a campus sustainability committee should determine which steps JCSU should take to reduce Scope 3 emissions due to solid waste, some recommendations for reducing waste sent to the landfill are included in the section of this report on recycling and waste management.

6.6.1.4.5 Reducing Scope 3 Emissions from Commuting

The 2011 GHG Inventory for JCSU did not include emissions from commuting; however, JCSU may consider conducting a commuting survey to determine the emissions due to commuting vehicles and may also consider including this information in future greenhouse gas inventories. More suggestions about reducing emissions due to commuting are included below.

6.6.1.4.5.1 Short-Term

With respect to the short term, future data is needed to quantify specific air emissions and the number and quality of student and staff drivers. However, informal interviews have indicated that many students typically use automobiles to travel around on campus in spite of the small size of the university. One effective strategy is to utilize a rent-a-bike program. In essence, this program allows a student to use the services of a bicycle, namely easy, emissions-free transportation across short-distances for short periods, without having to own the bicycle.

Many colleges and universities use this program to varying degrees, where some require a minimal fee for a weekend, month, or year, some require a down payment that students get back if they return the bike in appropriate shape, and some require no financial mechanism for accountability or program funding (AASHE, 2011h). For its part, Davidson College's residence halls offer free bicycles, which are reconditioned or bought new by Davidson Outdoors, to its residents in commuting around campus (Davidson College, 2010). JCSU may find the latter strategy advantageous as it provides the lowest barrier for engagement by students who may be recalcitrant to change behavior.

6.6.1.4.5.2 Long-Term

Regarding long term transportations initiatives, we recommend gathering more data to identify drivers' and commuters' practices. Other universities and campuses have helped to decrease emission to due to commuting by creating ride-share and rent-a-car programs (AAHSE, 2011i). Creating incentives for students and staff to commute to the University with colleagues living nearby can help ensure the success of ride-share programs.

Elon University has an established carpool system not only for the conventional commute to the campus for staff and students alike but also for one-time trips to, say, the Raleigh-Durham Airport or from Atlanta for Spring Break (Elon University, 2011). The latter places a fuel efficient vehicle, typically a hybrid Toyota or Honda, that students and staff can rent for a period of time (with or without a fee) in order to reduce the number of vehicles congested the university and surrounding roads and to reduce air pollution concerns. Hertz, I-GO, WeCar, and Zipcar all provide this basic service to schools like University of Kentucky, Truman College, Tulane University, and Duke University, respectively (AASHE, 2011i).

6.6.2 Campus Sustainability Initiatives

Recycling and dining are two areas in which Johnson C. Smith can make a significant impact on campus sustainability. Buy-in from JCSU faculty, staff and students will maximize the likelihood that these initiatives are implemented successfully. We based these recommendations on data collected from other universities and AASHE, as well as through two surveys taken of JCSU students and faculty/staff in the summer and fall of 2010. The following sections will discuss the survey and other methods on which the recommendations are based, and will detail the project descriptions for recycling and dining. In addition, we will include recommendations on developing a website to inform stakeholders within the University community about sustainability strategies being implemented on campus.

6.6.2.1 Website Development

Johnson C. Smith can work to develop an institution-wide website that will act as an avenue to promote and market the many sustainability projects that are already and will be in place. This website will reflect both the environmental and social aspects of sustainability as well as provide a place to discuss the many community partnerships JCSU has developed over the years. As part of developing the website, a small stakeholder group can be formed to examine the possibility of creating an umbrella identity, or "brand" or "logo," for these programs as a way to better market and promote these programs.

This website, and potential identity, if developed, will reflect Johnson C. Smith in a more informed light to students, faculty, staff, parents, alumni, benefactors, granting agencies, and the local community.

6.6.2.2 Recycling

6.6.2.2.1 Background and Methods

6.6.2.2.1.1 Survey and Survey Design

During the summer internship, the Duke team designed one survey to obtain feedback from JCSU faculty, staff, and administrators about current and future environmental sustainability efforts and another survey for students. Even though we targeted different audiences, the content and questions from both surveys were identical. Both surveys were intended to help the team to chart a roadmap for JCSU's sustainability framework and to develop specific programming for employees and students.

To incentivize participation, gift certificates to a popular coffee shop Kokomo's were offered to the first 25 respondents, and the next 25 respondents received reusable shopping bags. Specific instructions were given to potential participants that their identities would not be shared, their responses would be kept confidential, they would not be penalized for not completing the survey or skipping questions, and they would not be contacted further unless they themselves expressed explicit interest in further sustainability at Johnson C. Smith University. The team administered the surveys during the Fall term and had 95 and 139 respondents for the employee and student surveys, respectively.

6.6.2.2.1.2 Survey Results

6.6.2.2.1.2.1 Demographic Results

For the staff and faculty survey, we collected information on the respondents' affiliation to provide us with a rough idea of the representativeness of our sample is of the population of employees.

For the student survey, we collected information on the respondents' gender, year in school, and status as fulltime students to help us determine how representative our sample is of the population of undergraduate students.

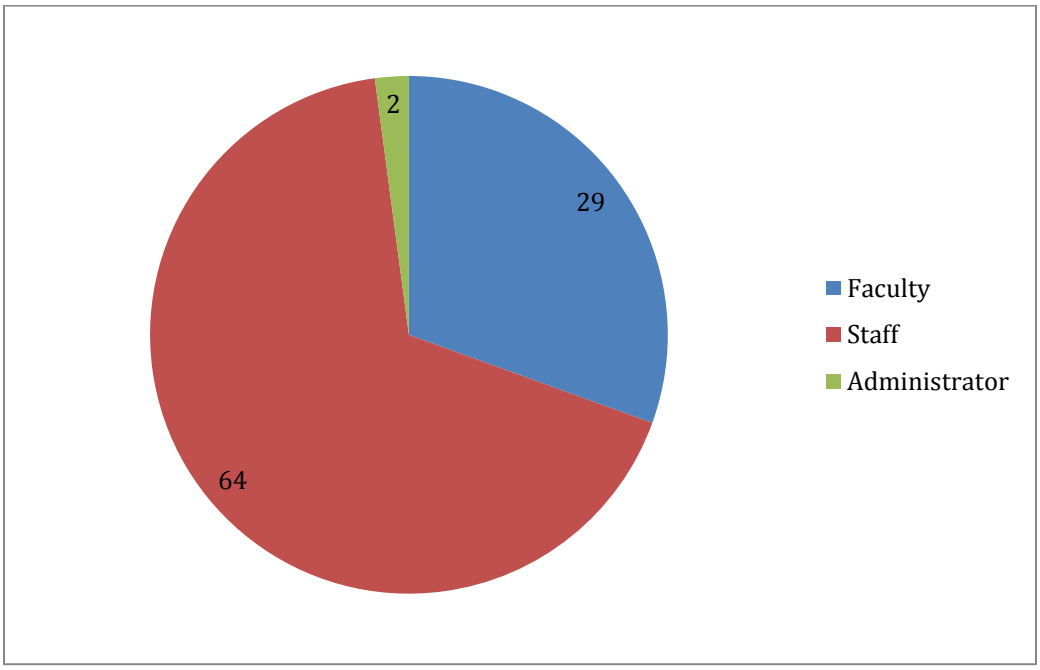

Figure 8: Chart showing the affiliation of respondents to the faculty and staff survey

As shown in Figure 8, a majority of the respondents to the faculty and staff survey were staff (67%) while only 2% of the respondents were administrators.

A mix of students of different classes responded to the survey with a plurality of third year students (35%) making up the largest percentage of any class (see Figure 9). As shown in Figure 10, a majority of the student respondents were female (79%). Nine percent of students identified as students in the Metropolitan College (see Figure 11).

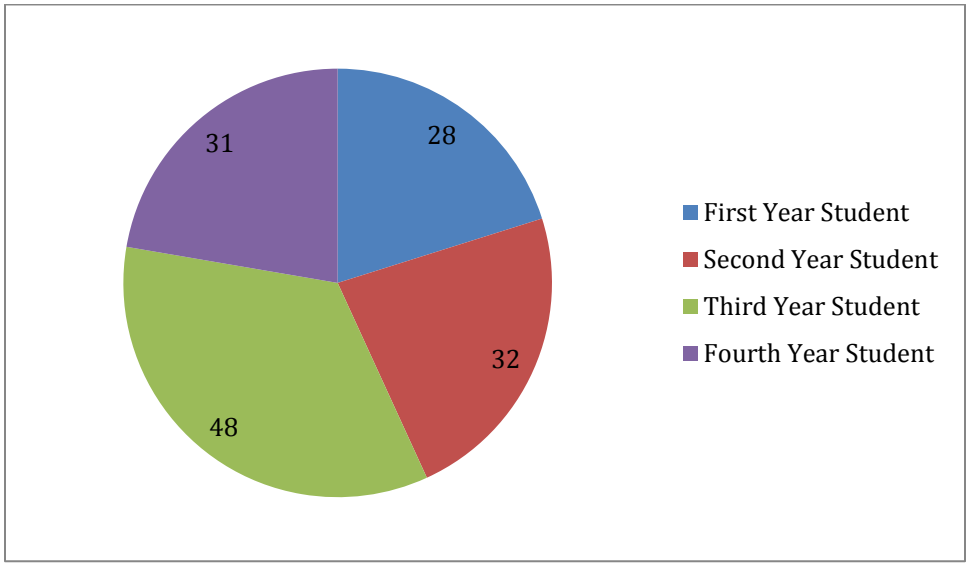

Figure 9: Student year of survey respondents to JCSU Go Green Student Survey

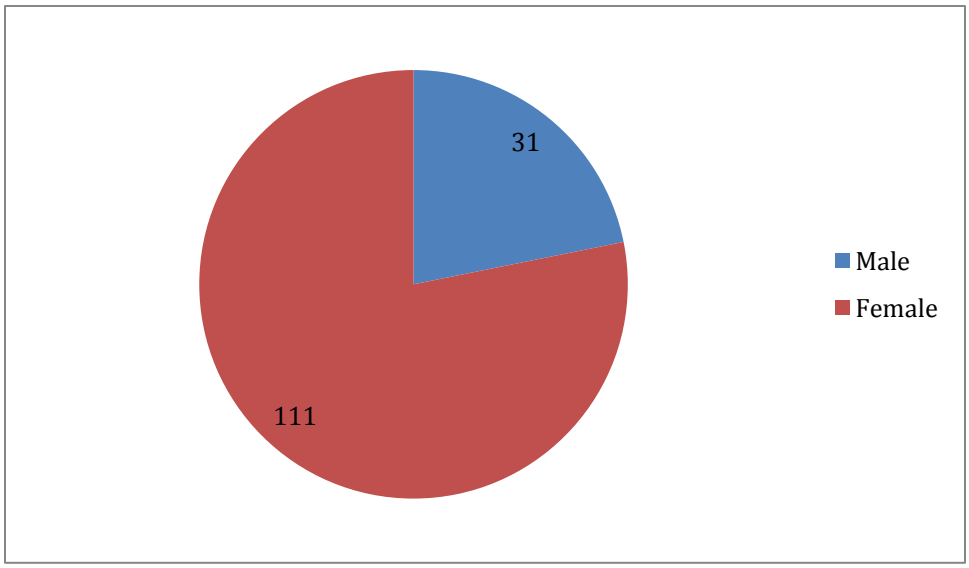

Figure 10: Gender of survey respondents to JCSU Go Green Student Survey

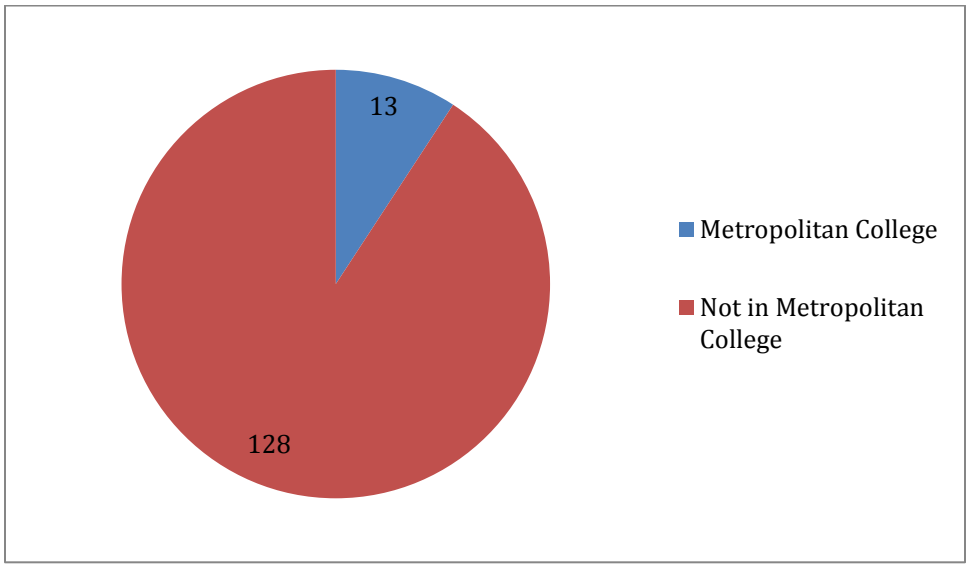

Figure 11: Status of respondents to JCSU Go Green Student Survey as daytime students or students in JCSU's Metropolitan College

6.6.2.2.1.2.2 Survey Responses

According to the results shown in Table 8 and Table 10, students believe that JCSU uses sustainable practices most effectively in and could most improve its sustainability practices in recycling. According to the results shown in Table 9 and Table 11, JCSU faculty and staff indicated their responses that JCSU excelled most in this area but could also use the most improvement in this area. In the free response sections, student respondents voiced most often their desire for improvements in the campus recycling system.

Answer	Number of respondents who indicated this answer	Percentage of respondents that indicated this answer
Recycling	52	39%
Procurement	18	13%
Dining	32	24%
Energy Use and Efficiency	34	25%
Transportation	28	21%
Waste management	18	13%
Water Management	30	22%

Table 8: Table that indicates the students' responses to the following survey question: in what areas does Johnson C. Smith University use sustainability the most effectively?

Answer	Number of respondents who indicated this answer	Percentage of respondents that indicated this answer
Recycling	67	74%
Procurement	10	11%
Dining	13	14%
Energy Use and Efficiency	20	22%
Transportation	7	8%
Waste management	13	14%
Water Management	13	14%

Table 9: Table that indicates the responses of faculty and staff to the following survey question: in what areas does Johnson C. Smith University use sustainability the most effectively?

Answer	Number of respondents who indicated this answer	Percentage of respondents that indicated this answer
Recycling	74	53%
Procurement	58	41%
Dining	68	49%
Energy Use and Efficiency	56	40%
Transportation	41	29%
Waste management	52	37%
Water Management	34	24%

Table 10: Table that indicates the students' responses to the following survey question: in what areas can Johnson C. Smith University most improve its sustainability practices?

Answer	Number of respondents who indicated this answer	Percentage of respondents that indicated this answer
Recycling	52	56%
Procurement	44	47%
Dining	28	30%
Energy Use and Efficiency	43	46%
Transportation	19	20%
Waste management	30	32%
Water Management	26	28%

Table 11: Table that indicates the responses of faculty and staff to the following survey question: in what areas can Johnson C. Smith University most improve its sustainability practices?

In addition, recycling and waste management was one of the areas that JCSU staff specifically mentioned to the Duke team in individual interviews early in the project chronology with respect to the composition of this Campus Sustainability Framework. As a result, particular attention is paid to specific improvements. Research, data collection, and interpretations were based upon resources from AASHE, personal interviews, and research on three particular peer institutions—Duke University, University of North Carolina at Charlotte (UNCC), and Vanderbilt University. Duke and Vanderbilt were chosen for reasons already discussed. UNCC was targeted because it is located in the same city as JCSU and, therefore, experiences many of the same constraints and waste management issues that JCSU faces now and would face in the future.

6.6.2.2.2 Recommendations

6.6.2.2.2.1 Short-Term

The new Sustainability Staff person recommended above would have responsibility to manage recycling, although many recycling programs at universities begin as student-run initiatives. Recycling representatives from three interviewed schools (Vanderbilt, Duke, and UNC Charlotte) mentioned that eventually, recycling programs need employees (Fitzgerald, Bucholz, and Boutin-Pasterz, 2010). Although students can help with recycling events and recycling collection, they cannot be reliable coordinators of recycling year-round (especially during the summer and holiday months). In particular, according to Arwen Bucholz, Recycling Coordinator at Duke, starting a program with top-down buy-in and financial support may likely make starting a program faster and easier.

Next, JCSU could begin to measure the amounts of all campus recyclables collected through its program. JCSU may want to contract with a vendor to receive monetary returns on its aluminum and plastic recycling.

Finally, JCSU could provide clear and uniform signs on all campus recycling bins in all locations. These signs should clearly state and show the appropriate recyclable material and be recognizable. Ideally, these signs would bear the design from the sustainable logo competition.

6.6.2.2.2.2 Mid-Term

During the mid-term, the recycling program should be expanded at a pace consistent with adequate funding, direct management, and sufficient educational efforts. Increased collection of recyclables and improved access and convenience of the recycling program are key requirements for a successful program that will decrease campus waste and increase program participation.

First, increasing campus recycling necessitates increasing the number of bins across campus as well as rearranging current bin placement to better accommodate user needs. For example, plastic bins can be moved from the back hallways of classroom buildings to the doorway areas of large lecture halls, conveniently available for the disposal of students' water and soda bottles on the way out of class. Recycling bins should be clearly visible and

available in all academic, office, administrative, residential, and recreational buildings. The mapping and placement of bins should be the responsibility of the Sustainability Director, in cooperation with the appropriate building or departmental manager, in order to facilitate a centralized and efficient system.

Once the recycling program has established itself, then each staff and student should receive a recycling bin along with a trash can upon moving into his or her dorm room or office. This will encourage individual responsibility for recycling and impress upon students the integration of recycling into campus life as an expectation for student behavior. For students, this should also include appropriate education, i.e. through the Eco-Reps program, at the beginning of the school year about how to use the room bins properly and how to participate in the campus recycling program; and, for staff, this should likewise include education where recycling containers are provided only when staff in across a department attend a seminar on how to use the room bins properly and how to participate in the campus recycling program. To immediately give everyone bins, however, can exhaust resources and personnel before the program has had time to mature.

Procuring balers to compact light recyclables, such as paper and aluminum, would serve to improve the efficiency and cost-effectiveness of the program. Balers would allow the university to bundle more materials in each pickup and receive more returns for larger shipments of recyclables. Currently, JCSU receives minimal monetary returns for its paper recycling, and no returns from aluminum, because of the low current volume of both materials in each monthly campus shipment to the downtown recycling center.

In the case of Vanderbilt University, in consulting with Smurfit-Stone, the Nashville recycling center that accepts Vanderbilt's recyclables, a company representative stated that the best way Vanderbilt could improve its recycling returns would be to compact its shipments with an on-site baler. Once the current recycling program is improved with more frequent campus pickups, thus eliminating waste and greatly increasing the amount of recyclables that arrive at the main campus drop-off, a baler may be a wise investment to continue improving the program and increasing monetary returns.

Second, increased numbers of recycling locations and increased collection of recyclables necessitates an increase in the number of individuals and groups involved in

recycling pickup. In order to do so, we recommend hiring work-study students to work with the coordinator. The recycling program should hire at least three work-study students to assist the Sustainability Director with program management duties and to assist with recycling collection in office, administrative, and classroom buildings.

The recycling program should also form partnerships with additional student groups to help with recycling pickup at the campus dorms, allowing the number of pickups each week to increase in all residential locations. This will involve making the option of participating in recycling pickup for monetary compensation better known to student groups.

In order to promote the correct usage of an expanded system and increase campus awareness of and participation in the recycling program, a sustained educational outreach program is central to the success of such a program, especially with a somewhat transient university population. An effective educational program should target the entire campus community of faculty, staff, and students, especially new students who may not be familiar with the basics of recycling and energy conservation. Outreach can be developed through orientation programs, events, signage, websites, and other methods and materials.

6.6.2.2.2.3 Long-Term

Through the incorporation of the steps listed above and the establishment of a centralized recycling system and educational program for energy awareness, the development of an effective university-wide program can become a reality. The final step involves creating a more cohesive infrastructure for a complete and efficient program.

In order to fully accommodate campus recycling demand and eliminate unnecessary waste, the university should also expand the current program to include glass recycling. The majority of schools with comparable programs have established glass recycling methods, which significantly decrease the amount of broken glass littering campus grounds. Although some campuses have perceived that glass recycling may create a safety hazard, Rob Gogan, director of Harvard's recycling program, stated in an interview, "[Glass recycling] isn't really a safety issue as we'd have to deal with the glass whether as recycling or as trash" (Gogan, 2006).

Changes in procurement policies to recommend or require the purchase of recycled-content materials would "close the loop" to create a sustainable recycling system. JCSU's current office supply providers already offer a variety of recycled and recycled-content products at comparable costs to non-recycled items.

JCSU should also institute recycling services into all University events, from athletic events to fundraising benefits to distinguished speaker presentations. This again demonstrates the integration of recycling as an institutionalized campus policy and expectation to the campus and the surrounding community. Arwen Bucholz, the staff person in charge of recycling at Duke, separates aluminum cans out of the beverage stream after football tailgates because she finds so many aluminum cans and can realize a revenue benefit from the University by collecting cans at these events (A. Bucholz, pers. comm.). Individuals involved with recycling at Johnson C. Smith may also look for opportunities to separate recyclable items and sell these items at market.

In order to maintain an effective and sustainable program to reduce waste, the University should consider hiring a sustainability coordinator. The majority of expenditures will occur with initial capital expansion of the program and thus will be much more minimal in the long-term. Also, an improved recycling system will provide increased monetary returns on recyclables and decreased costs from waste due to dumping fees and tipping fees.

6.6.2.3 Dining

6.6.2.3.1 Background and Methods

We chose to include information on dining for several reasons. First, sustainable eating and dining is becoming an important social issue on college campuses as well as a pervasive issue in our country (for examples, see stories about Michelle Obama's White House garden in Burros, 2009 and making farmer's market accessible to low income families in Zezima, 2009).

Second, team members on site noticed significant potential for improvement for sustainability practices in campus dining. Finally, several students and staff members expressed their interest in improving the sustainability of campus dining through their survey responses and through comments to our team. Forty nine percent of student

respondents to the survey thought that JCSU could most improve its sustainability practices in the area of dining.

6.6.2.3.2 Recommendations

JCSU's campus sustainability committee should strive to develop methods of increasing awareness of sustainability issues related to dining and to implement methods of reducing the environmental impacts of campus dining. Recommendations for increasing awareness and decreasing environmental impact are included below. This analysis focuses particularly on the areas of waste reduction, environmentally sustainable food products, and consumer education. The state of these areas at Johnson C. Smith University and discussion of incorporating sustainability into these areas will be discussed. Short, mid, and long-term recommendations for dining strategies follow this analysis.

6.6.2.3.2.1 Waste Reduction

6.6.2.3.2.1.1 Decreasing Landfilled Food Waste

JCSU should consider reducing food waste by reducing the amount of food that students throw away and by considering composting student waste. In the Go Green survey, one student commented that improving the quality of food at the café would reduce food waste. If students are throwing away food due to perceived lower quality, this may increase the amount of food waste being landfilled. Johnson C. Smith could examine how much students are throwing away from the dining hall.

Food waste that is being landfilled currently could be composted instead. JCSU could start a campus-wide composting program to compost food waste before it is consumed and after. At Duke University, employees in the large cafeteria-style eateries compost food scraps before consumption (e.g. vegetable peels and egg shells). The employees also compost food that students leave behind by encouraging students to leave their food on their plates and then composting students' food waste (A. Bucholz, pers. comm.).

Of the 322 schools assessed by the College Sustainability Report Card, 62.42% had food composting (Sustainable Endowments Institute, 2011b). Approximately 69% of the AASHE STARS institutions had pre-consumer composting at their dining facilities. Fifty-six percent

of these institutions had post-consumer composting at their dining facilities (AASHE, 2011a)

6.6.2.3.2.1.2 Decreasing Landfilled Disposable Dishware Waste

JCSU could reduce waste and help make its dining practices more environmentally sustainable by changing the dining flatware and dishes in its student cafeteria. At both the faculty and student dining halls at Johnson C. Smith, community members who want to get their meals to go must often use Styrofoam containers, bleached napkins, and plastic flatware. On several occasions that we visited the student dining hall in the summer, washable flatware and dishes did not seem to be available at all. Several students expressed their concern about not being able to get food on actual dishes or in more sustainable take-out containers. In addition, a number of students mentioned the Styrofoam containers and lack of other options.

Students also expressed concerns about waste from dining utensils and dishware in the survey distributed to students. Five students commented on the paper plates and cups used in the cafeteria each day. One student commented in the survey that the dining area did not provide an adequate amount of seating for students. Crowding in the dining hall may lead many students that would otherwise stay and eat to take their food to go and may lead to the necessity for more take out containers.

Johnson C. Smith can learn from the example of universities that have developed initiatives to reduce waste from disposable dining utensils, dishware, and cups. Several universities and colleges have started initiatives to decrease waste from disposable dishware and drinking containers. In 2009, students involved on Pacific Lutheran's Sustainability Committee launched a campaign called Take Back the Tap. The students formed a campaign to discourage people from buying, selling, and drinking bottled water.

To encourage PLU community members to stop using bottled water, Committee members sold reusable Nalgene bottles to students for only $1. The Committee members also worked with the University to make changes to water fountains to make them more conducive fill up stations for water bottles (Albert, 2009). To showcase its commitment to sustainability, Fayetteville State gives all residential students reusable to-go boxes and cups at no cost to students (Fayetteville State University, 2009). For the past two years,

Duke Dining has had reusable take-out "clam shell" containers for sale for $5. After purchasing these containers, students could opt to get their meals served in these reusable containers instead of using disposable takeout containers.

The sale of these containers helps to encourage waste reduction among students (Duke Sustainability, 2010b). Giving or selling students reusable containers at a reasonable price could also help JCSU reduce waste in the dining hall.

6.6.2.3.2.2 Environmentally Sustainable Food Products

6.6.2.3.2.2.1 Encouraging Local Foods Purchasing

Encouraging the purchase of local foods would be beneficial to JCSU because local food purchasing can help provide fresh produce and animal products to University community members, support local farmers, and cut down on greenhouse gas emissions used for food transport. Approximately 97.5% of the institutions assessed by the College Sustainability report card had local food offerings in their dining halls.

The six schools assessed in North Carolina (Davidson, Duke, UNC Chapel Hill, NC State, UNC Greensboro, and Wake Forest), the other Duke Endowment legacy schools, and the three historically black colleges assessed by the report card (Howard, Spelman, and Hampton) all had local food offerings (Sustainable Endowments Institute, 2011b).

6.6.2.3.2.2.2 Creating a Campus Garden or Farm

JCSU could investigate the possibilities of creating a campus garden or farm on campus to help University students and employees to learn about the food-sustainability connection and to provide locally produced food to the University. Some interest in community gardening on JCSU's campus is evident from our research. Several JCSU employees and students suggested a garden or farm on campus in their survey responses.

Two JCSU employees suggested growing vegetables and other edible plants on the campus. Another staff member suggested refurbishing the greenhouse on campus and planting sustainable vegetables and fruits to provide for University community members. One staff member even volunteered to garden to help Johnson C. Smith's sustainability initiative effort. Of the institutions assessed by the Campus Sustainability Report Card, 70.50% had community gardens on campus (Sustainable Endowments Institute, 2011b).

These institutions included the six schools assessed in North Carolina the other Duke Endowment legacy schools, and one of the three historically black colleges assessed(Hampton University) (Sustainable Endowments Institute, 2011b). Duke University recently started a farm with the goals of raising crops for campus eateries and teaching members of the University and local communities about the connections between food, land, farming, and the environment (Offen, 2011).

6.6.2.3.2.3 Student Engagement

Engaging students may help to improve dining sustainability at JCSU and help to provide students with dining options that better meet their needs. In the survey, six students commented on what they perceived as lack of quality, variety, and healthfulness of food served to students in the JCSU café in open-ended questions about sustainability on campus.

Several students that our team worked with over the summer also commented on how they thought that the food at the café was generally unhealthy. Faculty and staff who eat on campus eat in a separate dining area with different menu options. No faculty or staff members commented on the quality of the food in the faculty and staff survey, which included the same open-ended questions as the student survey.

We recommend that JCSU consider engaging students in discussion about improving campus dining sustainability. JCSU may consider promoting the formation of a committee of students and others to improve dining on campus. Duke University has a Student Dining Committee under the direction of Duke Student Government. The Dining Committee (Duke University Student Dining Advisory Committee or DUSDAC) helps to foster communication among students, employees, customers, and vendors. DUSDAC also helps to ensure that Duke provides "delicious food, fair prices, great customer service, and clean, well-organized facilities" (Duke University Dining, 2011).

Duke also has an Ad Hoc Green Dining Committee that has the goals of promoting recommendations for making campus dining more sustainable and helping campus eateries that are working to make their practices more environmentally sustainable (Duke University Sustainability Office, 2011). JCSU could also have a working group or sub-committee within the campus sustainability team that addressed dining and food.

6.6.2.3.3 Summary of Recommendations

6.6.2.3.3.1 Short-Term

- Recommendation on Dining and Reducing Waste: Give University employees and students discounts for bringing their own mugs or cups for beverages in the campus dining halls and eateries.
- Recommendation on Dining and Reducing Waste: Evaluate the feasibility of options for reducing waste from dishes, cups, and utensils. Switch to using real plates, silverware, and cups or biodegradable disposable products if feasible.
- Recommendation on Dining and Local Foods: evaluate purchasing process for campus dining and try to incorporate local foods into purchasing for campus dining.
- Recommendation on Dining and Local Foods/ Consumer Education: Arrange trips for students to local farmers markets in Charlotte to expose students to local and healthful foods available to them in their community.
- Recommendation on Dining and Consumer Awareness: Create programming to educate students and employees about local foods and sustainable dining options.
- Recommendation on Dining and Student Engagement: Form a committee with student members to improve campus dining.

6.6.2.3.3.2 Mid-Term

- Recommendation on Dining and Reducing Waste: Purchase reusable mugs and to-go containers to sell or give to students, depending on funds available.
- Recommendation on Dining and Sustainable Food Products: Consult with a nutritionist to see how campus dining for students could best provide students with healthful food.

6.6.2.3.3.3 Long-Term

- Recommendation on Dining and Reducing Waste: establish composting program for food waste pre-consumer and post-consumer.
- Recommendation on Dining and Campus Community Garden/Farm: Establish campus community garden or farm.

6.6.3 Education and Awareness

Campus initiatives that promote a culture of sustainability are typically successful when they obtain buy-in from University stakeholders. To educate staff and students about sustainability, we recommend that Johnson C. Smith develop several different educational initiatives as part of its sustainability plan. The project descriptions for these educational initiatives are outlined in this section of the report.

6.6.3.1 Competitions

6.6.3.1.1 Dorm Energy Conservation

Electricity production and distribution has important environmental and human health effects on land, water, air, flora, fauna, and humans; and, it also has important financial consequences. As a way to reduce mal-effects on the environmental and human health and to decrease utility bills, conserving electricity consumption should be a habit ingrained in community members, especially students who may develop habits in college and carry them forward for years to come. One of the most effective ways that colleges have ingrained this conservation mindset is through the practice of a residential electricity conservation competition, also known as a dorm energy competition.

6.6.3.1.1.1 Background and Methods

Electricity production and distribution has important environmental and human health effects on land, water, air, flora, fauna, and humans; and, it also has important financial consequences. As a way to reduce mal-effects on the environmental and human health and to decrease utility bills, conserving electricity consumption should be a habit ingrained in community members, especially students who may develop habits in college and carry them forward for years to come. One of the most effective ways that colleges have ingrained this conservation mindset is through the practice of a residential electricity conservation competition, also known as a dorm energy competition.

A dorm energy competition is a program where student residents compete on an aggregate level, such as by residence halls or dormitories, over a certain period of time to determine which dorm can reduce its electricity consumption per capita the most.

The goals of the program are for residents to reduce their energy consumption by a significant amount by altering their otherwise normal behavior and for residents to perpetuate their energy conservative behaviors, to at least some degree, after the end of the competition and, ideally, into the rest of their lives.

To make recommendations for Johnson C. Smith on competitions, the team included a question in the survey that they sent out to JCSU students and analyzed these results. Based on survey results, JCSU would be largely in favor of competitions. Ninety-one percent of the 136 students responding to the survey said that they would be interested in participating in friendly competitions.

The Duke-student team relied upon AASHE resources, particularly the Dorm versus Dorm Sustainability Competitions (2011c), which contained information on other institutions' competitions, to document the key considerations and attributes for university decision-makers in planning a dorm energy competition. Key takeaways and lessons learned from previous competitions are included in the recommendation section.

6.6.3.1.1.2 Recommendations

Given the success of these competitions across many colleges and universities committed to advancing sustainability, JCSU should strongly consider adopting this program and coupling it with other programs as well. In order to implement a successful residential electricity conservation competition, we have included recommendations below on encouraging student participation, managing the competition, and tracking progress of the competition.

6.6.3.1.1.2.1 Encouraging participation

Encourage students to participate in the competition by advertising the event and by communicating with student groups. The most successful competitions seamlessly integrate behavioral, peer encouragement, and a well-meaning sense of competition. This means that there needs to be instruction, either formal or informal, on what actions students can take to reduce the number of kilowatt-hours they consume. Fliers with educational information about computer and appliance usage can help encourage participation in the competition and help encourage an ethos of sustainability among students. Peers, especially the Eco-Reps, can encourage one another to participate on the principles of

environmental stewardship or, at least, as a group bonding experience. While these two strategies, ideally, should engender lasting behavioral change, the need to compete can push students to go to seemingly absurd lengths to win the competition. Competitions can also serve as an educational to illustrate how dependent the students are on electricity to function and be seemingly happy.

Give participating students prizes to encourage and motivate participation. To underscore the importance of motivating participation, Prizes are needed to incentivize participation. Prizes could be in the form of a rotating asset for that year's winner, like a pool table, or a dinner party where t-shirts reading "We Did It in the Dark 2012." Bragging rights afterward can also be a powerful incentive.

Begin the competition with a kick off to excite participants and educate University community members about the competition. The competition should begin with an appropriate kick off with lots of well managed publication, education, and motivation in advance.

Encourage students to sign a pledge to reduce energy usage. Some, but not all, universities and colleges have also chosen to campaign students to make a zero-waste or energy pledge (or some level of reduction) for one year during or after the competition. This way, students may remain accountable to themselves in terms of continuing the lessons learned from the experience and can reaffirm that pledge after every year of participation.

6.6.3.1.1.2.2 Monitoring progress of competition and keeping participants motivated

Track progress of energy usage so participants can monitor how well they are doing and modify their behavior accordingly. Progress needs to be tracked in order to give participants feedback on how well their actions are faring in terms of kilowatt-hours saved. Johnson C. Smith University's sub metering can help to monitor energy usage at a micro-level. Energy use data can be publicized through a website or a school newspaper.

Track progress of the effects of the competition on behavior. In order to gauge the relative success of the program from a behavioral perspective, it is wise to conduct online surveys before and after the competition. This way, the impact of the competition and how well it met its objectives can be evaluated to some credible degree.

6.6.3.1.1.2.3 Maximizing the likelihood of program success

Hold a competition near the beginning of the year to maximize visibility and participation. Selecting a time is important because it sets the optimal duration for the competition (i.e. not too long to cause burn out of participation and not too short to prevent students from starting or developing their newfound conservationist habits) at the optimal part of the school year (i.e. not in December when students are preoccupied with finals and Christmas).

Research options for fundraising for necessary expenditures like using the avoided cost of electricity to purchase necessities to fund the competition. Fundraising provides the necessary finances to set boundaries and parameters within which to work. Some universities secure funding by amassing the avoided cost of electricity generated and distributed from the conservation competition and applying the sum to the following year. In theory then, the program can pay for itself.

Encourage partnerships within the University to help encourage the competition's success. Due to the complexity of the competition, partnering with departments, offices, and possibly community members allows each aspect of the competition to be accounted and managed.

6.6.3.1.2 Logo Challenge

To kick-off their sustainability education and awareness campaign on campus, our team recommends that JCSU consider having a sustainability logo and slogan/motto contest for students and faculty. The new logo and slogan could then be printed on signs and also printed on various items such as t-shirts that could then be sold to pay for sustainability initiatives. Alternately, products with the symbol and slogan could be given as prizes to the first 25 attendees at a "go-green" kick-off event. As an example, Duke's "Bleed Blue, Live Green" slogan is paired with the logo shown in Figure 12 below.

Figure 12: Duke University's Sustainability Logo

The contest could be separated into two parts so that individual winners would be chosen in both the logo and slogan contests. First, second, and third places prizes could also be given in each category. To initiate the contest, an email from the sustainability committee would be sent to all faculty, student, and staff with details and rules for submissions.

After the agreed upon date, the committee would review all submissions then select their top five or six, after which the entire university would vote separately on the finalists for Johnson C. Smith's new sustainability logo and slogan. The time frame for the contest would be one month prior to Earth Day or another campus event with a sustainability focus.

6.6.3.2 Eco-Representatives Program

6.6.3.2.1 Background and Methods

The Eco-Representatives (Eco-Reps) program is a network of volunteer peer educators to keep students informed of campus sustainability initiatives and lead the way for behavior modifications related to environmental conservation. The goal of this program is to teach environmental responsibility and stewardship to the student body in the way in which they will be most responsive—through fellow classmates.

It also may provide excellent leadership opportunities for environmentally-concerned students and increases visibility of sustainability projects on campus. In addition, an Eco-Reps program may provide a heightened sense of community which is congruent with a community vision.

To develop recommendations on this section, information was pulled from resources from AASHE, particularly on peer to peer sustainability outreach campaigns (2011d), and from the schools' programs shown below. Table 12 shows the schools studied and information for each school including the names of the Eco-Reps program, the number of Eco-Reps, and the group to whom the Eco-Reps report.

School	Name of Student Environmental Group	Number of Eco-Reps	Group to Whom They Report
Bard	BERPs (Bard Environmental Resource People)	32	Environmental Resource Department
Bowdoin	Eco-Reps	--	Sustainability Office
Brown	Eco-Reps	40	Center of Environmental Studies
Carnegie Melon	Eco-Reps	--	A Student Affairs Program
Columbia	Eco-Reps	15	Department of Housing and Dining
Dartmouth	Eco-Reps	One for each floor of each dorm	Resource Working Group (formerly the Ad Hoc Committee on Environmental Policies for College Operations (CEPCO))
Harvard	Resource Efficiency Program (REPs)	20	Collaboration between the HGCI, FAS Office of Physical Resources, University Operations Services, Harvard University Dining Services, the Environmental Action Committee and Harvard College students
Johns Hopkins	Eco-Reps	10	The Johns Hopkins Sustainability Initiative - Office of Facilities Management
Sewanee	ERS	30 (one or two per dorm)	Faculty and Staff of the Environmental Resident Program
Smith College	Earth Reps	one for each house (elected)	Recycling Program (and others)
Stanford	eRep	one for each house (elected)	--
Tufts	Eco-Reps	50	Tufts Climate Initiative, with financial support from the Tufts Institute of the Environment.
UC Berkeley	Residential Sustainability Education Coordinators (RSECs)	--	Campus Recycling & Refuse Services
UVM	Eco-Reps	30	Department of Residential Life in collaboration with the Environmental Council and the Physical Plant Department with special support from the Recycling Program and the Energy Management Program.

Table 12: Table showing a sample of Eco-Reps data from other academic institutions (cells with dashes had no data available for these categories)

6.6.3.2.2 Recommendations

The Eco-Reps program can begin with appointment of five volunteer Eco-Reps in the class of 2016—one for each freshmen residence hall. This recruitment will be done prior to or at the beginning of fall of 2012. These Eco-Reps will potentially progress with their class, although it is only a one-year commitment. Each incoming freshmen class will have five new Eco-Reps appointed so by the time the class of 2016 is in their senior year, Vanderbilt will have forty Eco-Reps.

The duties of the Eco-Reps can include the following:

- Environmental Peer Education (spreading the word about programs and being available to answer questions)
- Promotion of Recycling and Energy Reduction
- Leaders in Inter-Dorm competitions around environmental projects
- Active role in Programming
- Biweekly meetings with group coordinator and other Eco-Reps
- Group coordinator will be elected among the registered Eco-Reps with shared jurisdiction by the Sustainability Director, SGA, and Housing Services & Business Operations

Recruitment for Eco-Reps would ideally be done before the fall semester starts so they can take part in sustainable programs, but it is unknown whether or not this is feasible for fall 2012. The academic year of 2012-2013 could be a pilot year with evaluation by all stakeholders at the end of the year prior to expansion and continuation of the program for subsequent years. A sample application is included in Appendix C.

Successful Eco-Rep programs at other universities are either purely voluntary or provide incentives to the volunteering students. Schools have used both monetary compensation and other incentives in exchange for Eco-Rep duties. Suggestions include a voluntary position rewarded with class credit, a housing or dining credit, or a cash credit to be used at the bookstore. Schools had expressed a concern about retaining the volunteers through all four undergraduate years if no incentive had been provided.

6.6.3.3 Events

6.6.3.3.1 Background and Methods

Based on survey data from students and staff alike, on resources available to AASHE members (AASHE, 2011f), and on personal interviews with staff at Vanderbilt and Duke Universities, the team has found that one of the best ways to energize a campus community is to hold a celebratory event. This was the main idea for the institution of the first Earth Day on April 22, 1970. Such opportunities allow for significant publicity of a campus's green efforts, increase morale and motivation to continue efforts to protect the environment, and serve as a recruitment mechanism for raising funds and participation rates for environmental programs.

The event can be completely devoted to sustainability or can be an existing unrelated event that is imbued with green themes and designs. While the former event has sustainability at the forefront and usually tries to deliver a message about its importance, the latter event incorporates sustainability in an indirect or subtle way and usually delivers the message that sustainability is not intrusive and can be seamlessly stitched into everyday functions.

6.6.3.3.2 Recommendations

There are three dates that are well suited for the first type of event. These are April 22 for Earth Day, October 20 for Campus Sustainability Day, and November 15 for America Recycles Day. While some of the other colleges and universities celebrate Campus Sustainability Day and America Recycles Day, almost all celebrate Earth Day. The challenge almost universally faced is that Earth Day is either during or right before finals and graduation, such that students, faculty, and staff are preoccupied with matters other than conservation. In consequence, we recommend JCSU celebrate Earth Day, which pay homage to the history of the environmental movement, and Campus Sustainability Day, which could coincide with a month-long dorm energy competition in October.

For the second type of event, Spring Fling may serve as the best venue. It is very well attended and is held dear by many in the JCSU family. As a result, through such green designs as local or organic food options, energy efficient appliances, and eco-friendly products like compostable utensils and LED lights, attendees of the Spring Fling may

realize, either during or after the fact, that the event was green and that they still had a great time or had an even better time.

7 Summary and Next Steps

In this document, our team has endeavored to provide sustainability strategies in the areas of energy efficiency in buildings, recycling, dining, and transportation. These categories were targeted based on data from Johnson C. Smith faculty, student, and staff as well as from research conducted on other colleges, universities, and institutions.

Furthermore, the initiatives recommended will be strengthened by the introduction of sustainability-focused competitions, student-led organizations, curriculum, and events on campus. Responses from the University-wide survey suggest that these efforts will be received favorably by the JCSU community.

In order to achieve their sustainability goals, our team recommends that Johnson C. Smith first develop a sustainability committee and create the university's inaugural sustainability plan. Members of the committee will be responsible for continually appraising and revising the sustainability plan components. As the results of our research show, having a sustainability committee is an integral part of a successful campus university program. In addition to having a committee, our findings show that hiring full-time sustainability staff will greatly increase the success of implementing sustainability efforts on campus.

The cost of hiring a full-time staff member could be completely offset with savings from the execution of energy-efficiency projects. Of the energy efficiency improvements suggested in the EDF Report with a payback period of less than one year, we found that the combined net present value of these projects is approximately $184,454. We used a very high percentage for discounting; thus, the net present value estimated in this paper is quite conservative. These energy savings could more than offset the hiring of a campus sustainability staff person at Johnson C. Smith University.

Finally, our team believes that with the many opportunities available to them, Johnson C. Smith University is well-poised to achieving climate neutrality, increasing the quality of

student-life, and becoming a beacon for other campuses and the community in the area of sustainability.

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[Part B]

[Johnson C. Smith University – Community Sustainability Outreach Report]

Client-based Team Masters Project
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April 29th, 2011

FINAL REPORT

Table of Contents

1 Community Sustainability Outreach at Johnson C. Smith University

Johnson C. Smith University (JCSU) has been an important part of the Beatties Ford Road corridor since the institution's inception in the 1800's. A map of the area, where Beatties Ford Road is located slightly right of center, is provided in Figure 1. In Part A of this Master Project, our team proposed a framework to assist Johnson C. Smith in the development of their inaugural campus sustainability plan. Because Johnson C. Smith is actively involved with the community, the University also requested that our team examine methods to involve neighboring homeowners and businesses in their sustainability efforts.

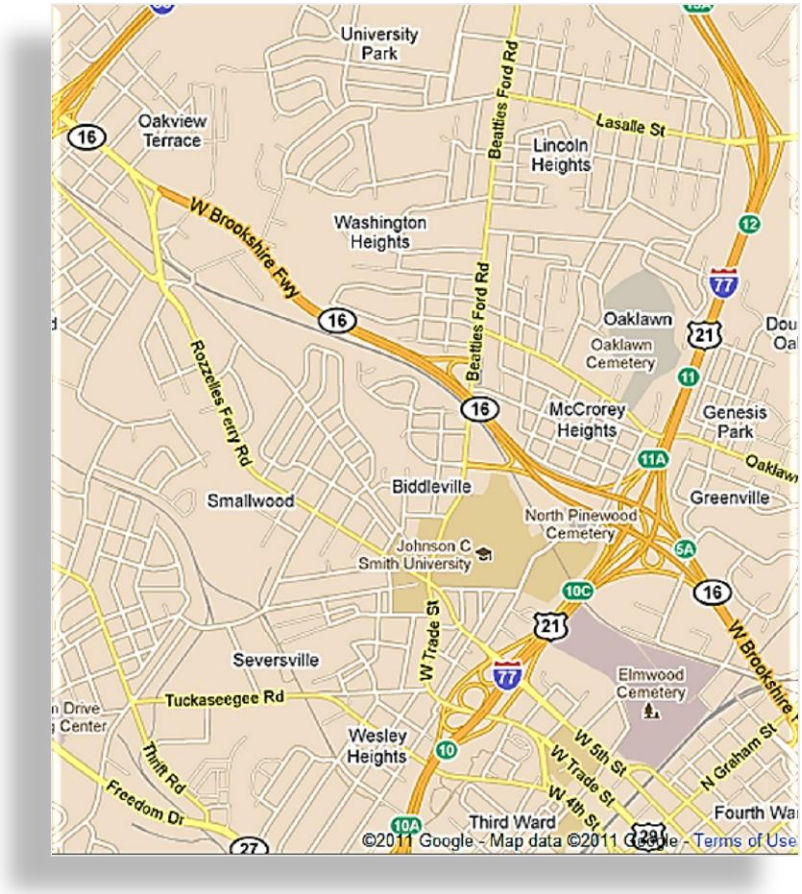

Figure 1: Beatties Ford Rd Corridor in Charlotte, NC. Source: Google Maps 2011

Johnson C. Smith endeavors to positively impact the communities around its gates through programs that empower community members to actively participate in the green economy and to make sustainable choices in their everyday lives. JCSU intends to engage neighboring homeowners and business in their sustainability efforts. Since President Carter began his term in

2008, JCSU has committed to investing in the revitalization of the Beatties Ford Road corridor and has encouraged private development in residences, retail shops, and other points of interest[2]. Green business and environmental awareness outreach will be a part of a larger effort to bridge the gap between uptown Charlotte and the Beatties Ford Road corridor.

JCSU is located near the intersection of Interstate 77 and Highway 16. Some of the neighborhoods in the Beatties Ford corridor include: Biddleville, Smallwood, Seversville, Five Points, Dalebrook, Eleanore Heights, Northwood Hills, Northwood Park, Hyde Park, Lakeview Village, Lincoln Heights, McCrorey Heights, Northwood Estates, Oaklawn Park, Oakview Terrace, Washington Heights, and Wesley Heights. This report contains sustainability findings and recommendations for homeowners and businesses in the neighborhoods adjacent to JCSU.

2 Background on 2010 Summer Masters Project Internship at JCSU

2.1 Summer Internship Project Areas

During the summer of 2010, two Nicholas school Masters Students interned at the Center for Applied Leadership and Community Development at Johnson C. Smith University. Summer objectives included: (1) University (Offset) – Community Home Energy Initiative, (2) Women Entrepreneurship Program (WEP), and (3) Go Green Student and Faculty Initiative. The recommendations in this report were primarily founded on the research and outcomes from the three community-based components to the internship:

1) University (Offset)-Community Home Energy Initiative: Study of "Green Rehab" program and research on a model for a student-led community home energy program. Additionally, development of a presentation on reducing energy and water use for homeowners in the JCSU community.
2) Women Entrepreneurship Program: Development of a presentation for mostly low-income women entrepreneurs living or working in the JCSU community on green business opportunities and practices.

[2] Singe, Kerry. 2010. Experts study Beatties Ford: Urban Land Institute meets at Johnson C. Smith this week to create blueprint for revitalizing the area. 6 Jun. 2010. The Charlotte Observer. Downloaded from http://www.charlotteobserver.com/2010/06/06/1481188/experts-study-beatties-ford.html. 1 Sep. 2010.

3) Go Green Student and Faculty Initiative: Research on various campus initiatives such as "Go Green" logo and slogan contests, campus residence hall competitions, and community outreach events.

2.2 HUD Grant and JCSU Involvement

The JCSU Center for Applied Leadership manages a U.S. Department of Housing and Urban Development (HUD) grant with four separate components that benefit the community. During the summer, Masters Students worked on projects in two of the grant areas: the Green Rehabilitation (Green Rehab) and Women Entrepreneurship Programs (WEP). As a part of the Green Rehab program, JCSU is partnering with the City of Charlotte to rehabilitate one home in each of the 12 neighborhoods in the campus' HUD grant geographic area. While the City of Charlotte program focused on general rehabilitation and home weatherization measures, JCSU provided additional funds to the grant in order to implement improved energy and water savings measures.

Summer activities included a review of Green Rehab participant application materials and work-orders for the first two projects that were both conducted during July and August of 2010. The renovations were for homes owned separately by the Fant and Morrison families. One year's worth of energy data, for the period June 1, 2009 to May 31, 2010, was also collected from the two Green Rehab participants prior to the commencement of rehab work and six months' worth of data, from September 2010 to the end of February 2011, was collected after. Before and after pictures of the renovations were also taken. In November of 2010, the Masters Project students returned to JCSU speak with Fant and Morrison families regarding their satisfaction with the program and discuss preliminary energy bill reductions.

The second area under the Center's HUD grant incorporated into the summer objectives was a program for low-income women entrepreneurs in the JCSU community. Our team developed a presentation to be given to the women on green businesses. The goal of the presentation was to educate WEP participants on methods for creating a "green" business, with examples from the Charlotte region, and steps for making an existing business, regardless of the industry, more sustainable.

2.3 Home Energy Presentation

Early in the summer, research on information most valuable to homeowners was conducted in preparation for a presentation to neighborhoods on energy and water savings. The presentation was given to three communities in the HUD grant zone surrounding JCSU during their monthly neighborhood meetings. Each meeting had approximately 25 attendees, who included single homeowners and retirees. During the presentation, homeowners were given tips on no-cost, low-cost, and higher investment measures to reduce their energy usage. The primary resource used for the presentation was the Energy Savers guide published by the Department of Energy[3]. During the November of 2010 visit, the Masters Project students gave an instruction session to JCSU students on how to deliver the Neighborhood Energy Presentation at future neighborhood association meetings.

2.4 Green Business Presentation

The primary result of our participation in the Center's WEP HUD grant area was the delivery of our green business presentation. A month before the presentation, the Masters team attended an orientation meeting for women interested in participating in the 2010 program and gave a brief overview of the green business presentation. Next, we researched online specific steps and resources for women entrepreneurs to green their business and identified green business opportunities in the Charlotte area. The presentation we developed focused on two areas: methods for creating a green business with examples from the Charlotte region and steps for making an existing business, regardless of the industry, more sustainable.

At the second WEP meeting on July 22nd 2010, the full presentation was given to the group with several handouts consisting of green business references and sources for more information. During the November visit to JCSU, Masters Students also attended a WEP meeting on developing business plans that included updates from the women on their business activities. We learned during the meeting that the current group of participants will be the last. Instead of having a second group of program participants in 2011, JCSU decided to provide further support for the 2010 women in the program.

[3] Energy Savers Booklet downloaded from Department of Energy's energy savers website (http://www.energysavers.gov/pdfs/energy_savers.pdf) in 2010

2.5 North Carolina Sustainability Summit[4]

During the summer, Johnson C. Smith provided funding for the Nicholas and JCSU students to attend the NC Sustainable Communities Summit in Charlotte. At the Summit, students attended workshops led by organizations such as, HUD, Builders of Hope, Asheville GO (Green Opportunities), and the US Green Building Council. Speakers touched on topics such as climate change, urban sprawl, regional planning, local food economic growth, federal agency partnerships, sustainability in European cities, business incentives, Leadership in Energy and Environmental and Design (LEED), and community development. The topics and organizations from the Summit helped shape some of the community outreach recommendations included in Section 4.0 of this report.

The theme of the 2-day conference was *Think –Plan–Act–Measure*. The take home message was that communities to think and plan globally but must act locally; measuring success based on the sustainability components of economy, environment, and social justice. Additionally, instilled in each session was a sense of urgency for the need to begin adopting green designs in cities and transportation.

Raleigh-based non-profit Builders of Hope (BOH) converts depilated houses into environmentally and energy-efficient homes, in order to provide affordable housing to low-income families. In their workshop, BOH stressed that the greenest home is an existing one. One poignant moment at the Summit took place during the Apprentices and Jobs workshop. In the session, two teens from Asheville GO, which trains mostly disadvantaged youth to become home weatherization technicians, spoke on how the organization transformed their lives and allowed them to do work that they and their family members could be proud of.

3 Evaluation of Summer-2010 Green Rehab Homes

3.1 Summary and Comparison of Fant & Morrison Homes "Before" Energy data

During July of 2010 renovations commenced on two homes funded through HUD grant managed by the Center of Applied Leadership and Community Development at Johnson C. Smith in partnership with the City of Charlotte and Duke Energy. These efforts included structural and

[4] Personal Account of NC Sustainability Summit by Andrea Lewis in July 2010

interior repairs as well as several energy-efficient and sustainable features, attributing to the program's 'Green Rehab' designation. The Weatherization/Energy saving measures and utility data for the first two Green Rehab homes owned separately by the Fant and Morrison families are discussed in the following sections.

3.1.1 Fant Home

The weatherization and energy savings measures that were incorporated into the Fant home rehabilitation work order include:

- Repair areas of Vinyl exterior siding for correct installation & weather resistance
- Securely patch floor and seal all edges
- Wrap exposed window frames with Aluminum coil stock
- Replace damaged roof decking and install new roofing
- Increase attic insulation, install fiberglass floor insulation, insulate exposed water line
- Clean Crawl Space &I Install Polyethylene vapor barrier
- Repair/patch holes in ceiling/kitchen/furnace closet with drywall/sheetrock Seal all floor/wall penetrations
- Install new exterior ducted range hood in kitchen with duct insulation
- New Dryer vent
- Remove and install new water supply (distribution lines), with inside shut-off valve & backflow preventer
- Upgrade/repair electrical service and electrical wiring system. Install new ban boxes, plugs, wall switches, and plug covers
- Install Energy Star light fixtures, switch, and ceiling vent with insulated duct in bathroom
- Install Energy Star ceiling fans in bedrooms and living room
- Install smoke & CO detectors
- Demolish gas furnace/compressor HVAC system and install SEER 15 Energy Star Heat Pump with new duct system
- Install mechanical fresh air intake through HVAC system
- Seal all exposed duct joints, metal joints, as part of new item
- Install new digital thermostat

One notable inclusion in the work order is the replacement of the Fant's gas HVAC (Heating, Ventilating, and Air Conditioning) system with an electric air Heat Pump. The Duke Energy utility summary[5] for the Fant home in Table 1 shows that the 3-bedroom, 1-bath home used 9,177 kilowatts (KW) and spent $888.80 for electricity over the 13 month period beginning June 1st, 2009. This equates to an average monthly usage of 706 KW and cost of $68. The highest monthly electricity use (1,192 KW) occurred in July 2009 with a cost of $105.01. Even though less energy (1,174 KW) was used in June 2010 than in July 2009, a slight increase in the energy rate led to the highest monthly bill total of $112.98. Additionally, the lowest monthly energy use was 365 KW in November 2009 with the lowest monthly bill of $38.57.

Data shows that a significant portion of the Fant home electricity use goes toward cooling the home. While the total winter energy usage was only 1,485 KW, the summer total was one and half times higher at 2,268 KW. These figures also reveal that the Fant electricity usage is increased since the total KW used in June 2010 was nearly 24% higher than in June 2009.

Bill Year/ Month	# Days	Electricity Usage	Electricity Usage Amount	Muni Fees	Late Payment Charge	Sales Tax	Total Dollars *
2009/06	30	950	$82.39	$0.00	$0.50	$2.47	$84.86
2009/07	33	1,192	$101.95	$0.00	$0.85	$3.06	$105.01
2009/08	29	1,076	$92.50	$0.00	$1.91	$2.78	$95.28
2009/09	32	930	$83.26	$0.00	$0.97	$2.50	$85.76
2009/10	30	516	$50.08	$0.00	$1.84	$1.50	$51.58
2009/11	28	365	$37.45	$0.00	$0.54	$1.12	$38.57
2009/12	33	527	$50.86	$0.00	$0.93	$1.53	$52.39
2010/01	31	516	$52.12	$0.00	$0.53	$1.57	$53.79
2010/02	28	442	$46.99	$0.00	$1.08	$1.41	$48.56
2010/03	32	433	$46.22	$0.00	$0.50	$1.39	$47.77
2010/04	31	440	$46.81	$0.00	$0.58	$1.41	$48.38
2010/05	28	616	$61.85	$0.00	$1.07	$1.86	$63.87
2010/06	32	1,174	$109.53	$0.00	$1.12	$3.29	$112.98
	397	**9,177**	**$862.01**	**$0.00**	**$12.42**	**$25.89**	**$888.80**

Table 1: Fant Home Duke Energy Utility Summary for June 1, 2009 to June 30, 2010

[5] Summary of electricity bills provided to JCSU by Duke Energy with homeowner's permission

3.1.2 Morrison Home

The weatherization and energy savings measures that were incorporated into the Morrison home rehabilitation work order include:

- Fill Voids
- Clean Crawl Space &I Install Polyethylene vapor barrier
- New Vinyl exterior siding
- Install insulation on front elevation wood walls
- Replace all windows with Energy Star rated vinyl double-hung windows
- Remove bedroom #2 air unit & re-install with new weatherization/insulation
- Build HVAC return air chase in Kitchen
- Seal edges of attic access and install barrier to contain insulation
- Install insulation in shed, ceiling, and floor
- Replace Gas Hot Water Heater (HWH) with Electric that has insulation blanket
- Replace gas wall furnace with new Seer 15 HVAC system with AirCycler to bring in fresh air
- Install new digital thermostat
- Install new bathroom overhead exhaust fan with light and bare light fixture over vanity
- Install new Kitchen range hood
- Upgrade electric wiring and breaker box
- Install new ceiling fixture with switch in hall and utility room
- Install new ceiling fans with light fixtures in 3 bedrooms and living room

The Duke Energy utility summary for the Morrison home in Table 2 below shows that the 3-bedroom, 1-bath home used 8,835 KW and spent $860.32 for electricity over the 13 month period beginning June 1st, 2009. This data is equivalent to an average monthly usage of 680 KW and cost of $66. Similar to the Fant home, the highest monthly electricity use (1,065 KW) occurred in July 2009 with the highest monthly bill cost of $94.61. Additionally, the lowest monthly energy use was 432 KW in December of 2009 with the lowest monthly bill of $44.29.

Bill Year/ Month	# Days	Electricity Usage	Electricity Usage Amount	Muni Fees	Late Payment Charge	Sales Tax	Total Dollars *
2009/06	30	840	$73.68	$0.00	$1.22	$2.21	$75.89
2009/07	33	1,065	$91.85	$0.00	$0.77	$2.76	$94.61
2009/08	29	984	$85.19	$0.00	$1.72	$2.56	$87.75
2009/09	30	874	$78.46	$0.00	$1.85	$2.35	$80.81
2009/10	32	635	$60.02	$0.00	$0.83	$1.80	$61.82
2009/11	28	450	$44.49	$0.00	$1.45	$1.33	$45.82
2009/12	31	432	$43.00	$0.00	$1.10	$1.29	$44.29
2010/01	33	471	$48.09	$0.00	$0.91	$1.45	$49.63
2010/02	28	435	$46.39	$0.00	$0.96	$1.40	$47.95
2010/03	29	450	$47.67	$0.00	$0.49	$1.43	$49.26
2010/04	34	635	$63.48	$0.00	$0.99	$1.91	$65.55
2010/05	28	649	$64.67	$0.00	$1.16	$1.94	$66.77
2010/06	30	915	$87.40	$0.00	$1.34	$2.63	$90.19
	395	**8,835**	**$834.39**	**$0.00**	**$14.79**	**$25.06**	**$860.34**

Table 2: Morrison Home Duke Energy Utility Summary for June 1, 2009 to June 30, 2010

Like the Fant home, most of the electricity usage in the Morrison home can be attributed to air conditioning. The total summer energy usage of 2,889 KW was twice the winter total usage of 1,353 KW. While the June 2009 vs. June 2010 increase was not as great as with the Fant home, the Morrison electricity usage increased as well. More specifically, the Morrison's energy rate for June 2010 was 9% higher than in June 2009.

3.1.3 Comparison

Without taking into account detailed information on the Fant and Morrison homes, such as home ages, occupancy usage, and equipment age/condition, a few comparisons can be made. Both homes have average monthly electricity bills of around $70, used the most electricity during the month of July, had higher energy usage/rates in June 2010 vs. June 2009, and use the majority of

their electricity to cool their homes. While both the Fant and Morrison homes have three bedrooms and one bathroom, the Morrison home is slightly larger. Despite the fact that the Fant home is smaller, the annual energy usage for the home is higher than the Morrison's. This finding can be attributed the larger size of the Fant household. However, the difference in energy usage between the two homes is less that 4% and so energy usage and costs can be treated as being roughly the same.

3.2 Fant & Morrison Homes "Post-Rehab" Activities

3.2.1 Interviews with Homeowners[6]

In November of the 2010 fall semester, Masters Students met separately with the Fant and Morrison families to receive their feedback on the Green Rehab process and repair work. Both Ms. Fant and Ms. Morrison were pleased overall with the program. Neighbors of both homes also spoke positively of the improvements.

Ms. Fant thought that the biggest improvements were energy related, such as the new windows, furnace, and insulation. She stated that family members in the home have become more conscious of saving energy and unplugging electrical devices since the rehab work was completed. Ms. Fant was also happy with changes in the bathroom and kitchen. However, the contractor that performed the rehab work was not to Ms. Fant's liking. She mentioned several issues with the lead contractor, who she felt was difficult to reach, as well as with his staff who neglected some simple matters. She recommended that program participants have more of a voice in the rehabilitation process.

As a result of the Green Rehab, Ms. Morrison stated that the family had reduced their lighting usage and begun to rely on ceiling fans in place of using the air conditioning. Ms. Morrison particularly liked working with the City of Charlotte representative, Sam Robertson, and taking money management and home buying classes at JCSU. The roofing, heating/air conditioning, and bathroom upgrades were the most notable to her. On the other hand, Ms. Morrison found living a hotel for nearly two months to be difficult. Specifically she did not care for the neighborhood, distance from home, and the noise level of the hotel.

[6] Ms. Fant and Ms. Morrison interviewed separately by both Katharine Grant and Andrea Lewis on November 5th, 2010

3.2.2 Energy Data Review

The post-rehab Duke Energy utility summary for the Fant home in Table 3 shows a 140% increase in the total kilowatts measures from September 2010 to February 2011 as compared the same time period, one year prior. Similarly, the energy usage of the Morrison home (Table 4) increased by 45% during the same time period.

Temperature differences, as measured in average monthly heating/cooling degree days, which measure by how many degrees and for how many days the temperatures recorded in the Charlotte region were below/above 65°F, are likely to have contributed to energy bill increases. During the time period in question, the average number of heating degree days was 35% higher in '10-'11 season that in the '09-'10 season. Also notable is that September 2010 was much hotter than September 2009, as revealed by the 57% increase in the average number of cooling degree days.

In the case of the Fant home, most of the increase in their Duke Energy electricity bills can also be attributed to replacing gas heating with electric heating and their gas bills are needed to conduct a complete evaluation. However, the possibility exists for both homes that other factors such as changes in home occupants or visitors as well as the addition of lighting fixtures, ceiling fans, exhaust hoods, and vents, are responsible for the higher energy usage.

Bill Year/ Month	# Days	Electricity Usage	Electricity Usage Amount	Muni Fees	Late Payment Charge	Sales Tax	Total Dollars *	HDD	CDD	% Increase Electricity Usage	% Increase HDD	% Increase CDD
2009/09	32	930	$83.26	$0.00	$0.97	$2.50	$85.76	37	241			
2009/10	30	516	$50.08	$0.00	$1.84	$1.50	$51.58	239	64			
2009/11	28	365	$37.45	$0.00	$0.54	$1.12	$38.57	367	17			
2009/12	33	527	$50.86	$0.00	$0.93	$1.53	$52.39	770	0			
2010/01	31	516	$52.12	$0.00	$0.53	$1.57	$53.79	844	1			
2010/02	28	442	$46.99	$0.00	$1.08	$1.41	$48.56	737	0			
2010/09	33	710	$67.80	$0.00	$0.90	$2.04	$70.07	23	337	-24%	-38%	40%
2010/10	29	416	$42.54	$0.00	$0.71	$1.28	$44.09	202	105	-19%	-15%	64%
2010/11	28	694	$64.75	$0.00	$0.46	$1.95	$66.97	434	18	90%	18%	6%
2010/12	33	2,781	$231.76	$0.00	$0.63	$6.96	$238.99	930	0	428%	21%	-
2011/01	31	2,008	$174.60	$0.00	$3.03	$5.25	$180.12	854	2	289%	1%	100%
2011/02	28	1,314	$118.94	$0.00	$0.00	$3.58	$122.79	493	23	197%	-33%	-
	639	18,786	$1,726.40	$0.00	$22.39	$51.88	$1,781.08					

Table 3: Fant Home Duke Energy Utility Bills Comparing September 2009 – February 2010 to September 2010-February 2011 with average monthly Heating Degree Days (HDD) and Cooling Degree Days (CDD) sourced from Degreedays.net

Bill Year/ Month	# Days	Electricity Usage	Electricity Usage Amount	Muni Fees	Late Payment Charge	Sales Tax	Total Dollars *	HDD	CDD	% Increase Electricity Usage	% Increase HDD	% Increase CDD
2009/09	30	874	$78.46	$0.00	$1.85	$2.35	$80.81	37	241			
2009/10	32	635	$60.02	$0.00	$0.83	$1.80	$61.82	239	64			
2009/11	28	450	$44.49	$0.00	$1.45	$1.33	$45.82	367	17			
2009/12	31	432	$43.00	$0.00	$1.10	$1.29	$44.29	770	0			
2010/01	33	471	$48.09	$0.00	$0.91	$1.45	$49.63	844	1			
2010/02	28	435	$46.39	$0.00	$0.96	$1.40	$47.95	737	0			
2010/09	33	1,029	$94.13	$0.00	$1.22	$2.83	$97.19	23	337	18%	-38%	40%
2010/10	29	721	$66.96	$0.00	$1.41	$2.02	$69.25	202	105	14%	-15%	64%
2010/11	28	567	$54.59	$0.00	$1.69	$1.65	$56.51	434	18	26%	18%	6%
2010/12	33	823	$75.08	$0.00	$1.12	$2.26	$77.61	930	0	91%	21%	-
2011/01	31	879	$81.62	$0.00	$0.79	$2.46	$84.35	854	2	87%	1%	100%
2011/02	28	758	$72.51	$0.00	$0.00	$2.18	$74.96	493	23	74%	-33%	-
	640	14,746	$1,395.50	$0.00	$23.41	$41.96	$1,440.25					

Table 4: Morrison Home Duke Energy Utility Bills Comparing September 2009 – February 2010 to September 2010-February 2011 with average monthly Heating Degree Days (HDD) and Cooling Degree Days (CDD) Degreedays.net

4 Recommendations for Future Sustainability Programs between JCSU and Businesses/Homeowners the Community

Based on research conducted during the summer internship and data collected over the 2010-2011 academic school year, our team proposes the following six recommendations, including three for Green Rehab program participants, to assist Johnson C. Smith in their goal of implementing sustainability in the community. These recommendations are categorized as have short, mid, or long term time frames of implementation. Those that are short-term could likely be implemented in the 2011-2012 academic year, mid-term recommendations might require from one to three years to implement, and long-term objectives might require more than three years to bring to fruition.

4.1 Recommendations for the Remaining Green Rehab Homes

4.1.1 Pre-/Post-Rehab survey and reception (Short-term Recommendation)

In order to accurately account for changes in energy usage following the completion of Green Rehab repairs, our team recommends that pre- and post-rehab surveys be administered to obtain statistics on home occupants and an inventory of all energy using devices. Alternatively, the contract bid for repairs could be modified to include an energy audit that compares the pre-/post-rehab upgrades side-by-side.

Furthermore, the survey should also include questions for the homeowners in areas of the rehab process that concern them the most before repairs commence, and their satisfaction level with various parts of the program following its completion. Johnson C. Smith could also consider hosting a coffee or tea reception for participants at the mid-way point of the program with the City of Charlotte Green Rehab representative and repair contractor. At this meeting homeowners could discuss any comments or suggestions related to the work being conducted.

4.1.2 Homeowner's Manual (Mid-term Recommendation)

To ensure that Green Rehab participants are familiar with all of the upgrades installed in their homes, JCSU might consider distributing a homeowner's manual during one of the program's courses. An outline for such a manual is included in Appendix D. The manual would be completed using materials from the Green Rehab contractor, equipment manufacturers, utility companies, and the City of Charlotte. The material covered would address warranty information and proper maintenance of all equipment and features of the home as well tips to reduce energy usage and contact information for repairs and emergencies.

4.1.3 Green Home Presentation/Student-led Training (Short-term Recommendation)

While Johnson C. Smith has already indicated that they intend to have students conduct the Home Energy presentation at monthly neighborhood association meetings, our team also suggests that Green Rehab participants attend an additional class on saving energy and water at home. The presentation could be given at any point in the rehab process, while attempting to maximize the number of program participants that can attend at one time. Additionally, the presentation could be enhanced with material from contractors and the City of Charlotte, with material on what to expect during the rehab process and a typical time-line of activities. Finally, the presentation attendees should be given a questionnaire immediately after to obtain their feedback.

4.2 Home Energy Fair (Long-Term Recommendation)

One of the outreach activities that JCSU expressed interest in, is the development of one or multi-day energy themed event sponsored by the university for homeowners and businesses in the area. The Community Home Energy Fair could be a collaborate event between the four legacy schools of Johnson C. Smith University (JCSU), Duke University, Davidson University, and Furman

University, or initially launched for the communities surrounding JCSU. If the four schools worked together for one event it would possibly take on two day conference format, as opposed to just a one day affair.

For the JCSU community alone, a one day fair at or near the University would be more feasible and most of the businesses in attendance would be from the Charlotte area. Pooling resources among the four legacy schools would allow more speakers and sponsors to be invited. Also, assembling a planning committee with faculty, staff, and students from all four schools would possibly allow the event to include more components of interests to the attendees and gain more sponsorship.

At either event, the focus would be on tips for saving energy and water at home. This theme would build upon the Home Energy Presentations. The home energy and water savings measures would be categorized in four groups:

- No-Cost
- Low-Cost
- Moderate Investment
- Significant Investment

For the moderate and significant investment categories, tips would be given on financing and on the pay-back period of the various improvements.

The target audience for both events would be homeowners in the neighborhoods surrounding the schools with substantial support from local businesses. At either event there would be both workshops and a separate sponsor area with booths. The outline below would apply to either the JCSU Community Home Energy Fair or the conference for all four legacy institutions, except the conference would feature more sponsors and workshops. Depending on the feedback, the fair or conference could be made into and annual event. Some proposed attributes of the program are as follows:

- Location: Conference Center central to the four schools (possibly in Charlotte), campus gymnasium, or campus auditorium with large hallways outside
- Date: Spring of 2012

- Invited Guests: Homeowners and businesses in communities surrounding school(s), as well as university faculty, staff, and students
- Sponsors: Home Depot, Lowes, Sears, Best Buy, Wal-Mart, Target, Harris Teeter, Whole Foods, Belk, other grocery and department stores, local businesses, NC state energy office, US Department of Housing and Urban Development, US Department of Energy, and other non-profit and government institutions
- Workshops: No and Low Cost Energy Improvements, Moderate to Significant Cost Energy Improvements, Tips on saving Water at Home, How to find a good contractor, How to obtain government funding, Planning your Green Remodel, Pros and Cons of Energy Improvement Mortgages, Solar panel installations, Insulating and air sealing your home, Collaborative Community-University Home Energy Programs, Tips on shopping for energy-efficient appliances and electronics, Sustainable landscaping, Sustainable transportation, Education children on energy and water usage

4.3 Student-Organized Community Sustainability Initiatives

Another category that Johnson C. Smith requested for our team to provide recommendations in was in regards to sustainability programs led by JCSU students that increase the campus' ties with homeowners and businesses in the surrounding neighborhoods. Possible initiatives for JCSU to consider are given in each of the short-, mid-, and long-term periods.

4.3.1 Partnerships (Short-term Recommendation)

One short-term student-organized community sustainability initiative that JCSU could implement would be to form a partnership with Asheville Go, Builders of Hope, Advanced Energy, U.S. Green Building Council, and/or Habitat for Humanity. The partnership could take the form of student chapter of the chosen organization(s) or as reoccurring community service projects for JCSU students in the area of green building and home rehabilitations.

Additionally, students could receive support from faculty to perform quantitative research and analysis on the energy saving from Green Rehab programs. Moreover, Duke Energy could also be contacted for assistance in performing energy audit calculations. This type of data collection is necessary in order to assess the emissions and energy reductions from green building retrofits.

4.3.2 Campus Demonstrations (Mid-term Recommendation)

The mid-term recommendation for Johnson C. Smith in the area of student-led community programs is to invite local businesses in the home-building and rehabilitation industries on campus to provide demonstrations to local homeowners on low cost energy/saving products. The demonstrations would include a discussion on where to buy the products, prices, and how to install them. JCSU students would work with the Center for Applied Leadership and Community Development to select vendors and arrange meeting dates and frequency on campus.

4.3.3 Community Service Projects (Long-term Recommendation)

Finally, the long term recommendation in this category is for JCSU to consider the creation of a student community service group or independent study class with faculty support that:

1) Meets with homeowners/local business owners to collect information for online energy audit (free software available from Department of Energy)
2) Research upgrade costs and create shopping list for homeowners/local business owners (Resources provided from software but local Home Depot, Lowes, Sears, and Wal-Mart stores should also be consulted)
3) Go shopping with homeowners/local business owners then return to home/business to install products purchased

Home and business owner volunteers could be solicited from the Home Energy Presentations given at the neighborhood association meeting and from new or existing local businesses that have a connection to the campus.

4.4 Sustainability Speakers Series

The final area that Johnson C. Smith might consider in their efforts to increase the education and awareness of community members on environmental issues, is the creation of sustainability-themed speakers series. Depending on the format selected, the speakers series could be implemented in the short-, mid-, or long-time frame.

4.4.1 Local Speakers (Short-term Recommendation)

JCSU could invite Charlotte and NC businesses and organizations to speak on the JSCU campus on topics related to sustainability and the environment. The first several speakers could be built into the existing Lyceum Programs series as early as the Fall-2011 semester.

4.4.2 National Speakers and Musical Artists (Mid-term Recommendation)

The mid-term proposal would be to organize a conference on Johnson C. Smith's campus with academic, non-profit, government, and business speakers from across the country to address a specific theme such as environmental sustainability, community development, and green design in cities. This conference could be possibly launched in conjunction with the Lyceum Programs Spring 2012 series. Additionally, a green jobs career fair and green vendor fair could be combined with the conference.

Notable speakers that JCSU might invite include Lisa Jackson, Marjora Carter, Van Jones, Jerome Ringo, Phaedra Ellis-Lamkins, Beverley Wright, Will Allen, Warren Washington and Robert Bullard. The conference might also include a musical performance by and artist/group that is actively involved in the sustainability and/or community development movement. Examples of artists that are active in environmental issues include The Roots, Drake, Will.I.Am, John Legend, Taja Sevelle, and Wiz Khalifa.

4.4.3 Field Study Course [7] (Long-term Recommendation)

Finally, the long-term recommendation related sustainability speakers is the development of a fall and/or spring break elective course in which students travel to cities such as San Francisco/Oakland, Boston, or Washington DC, in order to visit academic, non-profit, government and business organizations on the topic of alternative energy, energy efficiency, green jobs, and/or environmental policies. The destination and organizations selected for the first trip would be primarily selected by JCSU based on their interest. Additionally, students could create a resume book to give to speakers during the trip as well as to those that visit JCSU.

[7] This recommendation is inspired by Duke's Master of Environmental Management – Energy & Environment track's Clean Energy (San Francisco) California field study course, which was initially created by students and is currently in its third year.

5 Summary and Next Steps

In this report, our team has sought to offer Johnson C. Smith recommendations for achieving their goals of increasing the education and awareness of sustainability issues on campus and in the Charlotte community. Building upon the Masters Project internship during the summer of 2010, our team proposes that Johnson C. Smith consider the implementation of several sustainability initiatives that will link the University with the neighborhoods adjacent to campus, businesses and homeowners in North Carolina, and organizations throughout the nation. The following is a summary of our results:

Short Term

- Conduct pre/post survey for Green Rehab participants
- Plan reception for Green Rehab participants
- Give regularly occurring Green Home Presentations at monthly neighborhood association meetings and to Green Rehab program participants
- Partner with Asheville Go!, Builders of Hope, Advanced Energy and/or Habitat for Humanity to involve students in green building and home rehabilitation
- Have Charlotte and NC businesses and organizations speak during Fall 2011 Lyceum series on topics related to sustainability and environment

Mid-Term

- Create and distribute a homeowner's manual to Green Rehab participants
- Invite local businesses in the home-building and rehabilitation industries on campus to provide demonstrations to local homeowners on low-cost energy / water savings products
- Organize sustainability-themed conferences with notable speakers and musicians in the environmental and sustainability sectors

Long-Term

- Host a JCSU Home Energy Fair with workshops and vendor booths
- Form JCSU student community service group or independent study course that performs energy audits of local homes/ businesses and helps owners purchase and install energy/water savings products
- Develop fall and/or spring break elective travel field study course focused on alternative energy, energy efficiency, green jobs, or environmental policies
- Develop fall and/or spring break elective travel field study course focused alternative energy, energy efficiency, green jobs, and/or environmental policies.

By uniting the University and community around the topic of sustainability, JSCU will not only raise the environmental awareness of both groups, but improve the quality of life in the adjacent neighborhoods and shape student's future career choices for many years to come. These activities will further cement Johnson C. Smith's reputation as being Charlotte's Premier Independent University.

PART C

I. Appendices

A. Glossary of Terms

B. Duke Sustainability Coordinator Job Description

C. Eco-Reps Job Application

D. Homeowners Manual Outline

E. Student and Faculty/Staff Survey Results

Appendix A: Glossary of Terms

ACTIVE SOLAR: As an energy source, energy from the sun collected and stored using mechanical pumps or fans to circulate heat-laden fluids or air between solar collectors and a building.

ALTERNATIVE FUEL: Alternative fuels, for transportation applications, include the following:

- methanol
- denatured ethanol, and other alcohols
- fuel mixtures containing 85 percent or more by volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels -- natural gas
- liquefied petroleum gas (propane)
- hydrogen
- coal-derived liquid fuels
- fuels (other than alcohol) derived from biological materials (biofuels such as soy diesel fuel)
- electricity (including electricity from solar energy.)

BARREL: A unit of volume equal to 42 U.S. gallons.

BASE LOAD: The minimum amount of electric power delivered or required over a given period of time at a steady rate.

BASE LOAD CAPACITY: The generating equipment normally operated to serve loads on an around-the-clock basis.

BIOFUELS: Liquid fuels and blending components produced from biomass feed-stocks, used primarily for transportation.

BIOMASS: Organic non-fossil material of biological origin constituting a renewable energy source.

BLOWER DOOR TEST: A performance test that energy auditors use to determine how airtight your home is.

BUILDING ENVELOPE: The shell that separates the inside of a building from the outside conditions. The building envelope includes exterior walls, insulation, roofing, flooring, foundation, windows, and

BOTTOM OF THE PYRAMID (BOP): Broadly speaking refers to the four billion people living on less than 2/day who frequently lack access to financial resources and often rely on microenterprises for primary income generation

CARBON DIOXIDE (CO_2): A colorless, odorless, non-poisonous gas that is a normal part of Earth's atmosphere. Carbon dioxide is a product of fossil-fuel combustion as well as other processes. It is considered a greenhouse gas as it traps heat (infrared energy) radiated by the Earth into the atmosphere and thereby contributes to the potential for global warming. The global warming potential (GWP) of other greenhouse gases is measured in relation to that of carbon dioxide, which by international scientific convention is assigned a value of one (1). Also see **Global warming potential (GWP)** and **Greenhouse gases**.

Appendix A: Glossary of Terms

CARBON DIOXIDE EQUIVALENT: The amount of carbon dioxide by weight emitted into the atmosphere that would produce the same estimated radiative forcing as a given weight of another radiatively active gas. Carbon dioxide equivalents are computed by multiplying the weight of the gas being measured (for example, methane) by its estimated global warming potential (which is 21 for methane). "Carbon equivalent units" are defined as carbon dioxide equivalents multiplied by the carbon content of carbon dioxide (i.e., 12/44).

CARBON FOOTPRINT: the amount of carbon dioxide emissions created by a person or industry.

CARBON OFFSET: an instrument used to mitigate carbon emissions from one source of emissions by reducing carbon emissions from another source.

CARBON SEQUESTRATION: The fixation of atmospheric carbon dioxide in a carbon sink through biological or physical processes.

CARBON SINK: a reservoir that can absorb carbon dioxide from the earth's atmosphere; sinks include soils, peat, permafrost, ocean water, and forests (*Definition from the International Trading Association, www.ieta.org)*

CLEAN TECHNOLOGY: An emerging sector that comprises a diverse range of products, services, and processes that harnesses renewable materials and energy sources, dramatically reduce the use of natural resources, and cut or eliminate pollution and toxic wastes. These include such innovative and expanding technologies as solar photovoltaics (PV), wind power, hybrid electric vehicles, fuel cells, biobased materials, and advanced water filtration. *(Definition from Clean Edge* www.cleanedge.com*)*

COMPACT FLUORESCENT LAMPS (CFLs): CFL bulbs use 2/3 the energy of conventional bulbs and fit into regular light-fixture sockets; however, they cost more than conventional incandescent bulbs. CFLs are good for your energy bills and for the environment, but you should not throw them away in the trash. You can recycle them at Home Depots in Charlotte or at the Mecklenburg County Recycling Centers.

CRITERIA POLLUTANT: A pollutant determined to be hazardous to human health and regulated under EPA's National Ambient Air Quality Standards. The 1970 amendments to the Clean Air Act require EPA to describe the health and welfare impacts of a pollutant as the "criteria" for inclusion in the regulatory regime.

CRUDE OIL: A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Depending upon the characteristics of the crude stream, it may also include:

1. Small amounts of hydrocarbons that exist in gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casing head) gas in lease separators and are subsequently commingled with the crude stream without being separately measured. Lease condensate recovered as a liquid from natural gas wells in lease or field separation facilities and later mixed into the crude stream is also included;
2. Small amounts of nonhydrocarbons produced with the oil, such as sulfur and various metals;
3. Drip gases, and liquid hydrocarbons produced from tar sands, oil sands, gilsonite, and oil shale.

Liquids produced at natural gas processing plants are excluded. Crude oil is refined to produce a wide array of petroleum products, including heating oils; gasoline, diesel and jet fuels; lubricants; asphalt; ethane, propane, and butane; and many other products used for their energy or chemical content.

E85: A fuel containing a mixture of 85 percent ethanol and 15 percent gasoline

EMISSIONS: usually used in reference to exhaust or greenhouse gases or carbon dioxide production as a byproduct of human activity.

ENERGY: The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatthours, while heat energy is usually measured in British thermal units (Btu).

ENERGY STAR: A joint program of the Environmental Protection Agency and the Department of Energy, ENERGY STAR supports energy efficient products and encourages energy efficient practices. Look for ENERGY STAR products when you buy new appliances and other products for your home. Some ENERGY STAR products are also eligible for tax credits.

ENVIRONMENT: The natural environment as comprised of all living and non-living things that occur naturally on Earth. In its purest sense, it is thus an environment that is not the result of human activity or intervention. The natural environment may be contrasted to the “built environment.”

FUEL: Any material substance that can be consumed to supply heat or power. Included are petroleum, coal, and natural gas (the fossil fuels), and other consumable materials, such as uranium, biomass, and hydrogen.

FUEL CELL: A device capable of generating an electrical current by converting the chemical energy of a fuel (e.g., hydrogen) directly into electrical energy. Fuel cells differ from conventional electrical cells in that the active materials such as fuel and oxygen are not contained within the cell but are supplied from outside. It does not contain an intermediate heat cycle, as do most other electrical generation techniques.

GEOTHERMAL ENERGY. Geothermal energy comes from natural processes beneath the earth's surface, and is recovered as steam and hot water. Most domestic electricity from geothermal energy is generated in California, other western States, and Hawaii. The world's largest geothermal facility and the first commercial-scale development tools placed in California are at The Geysers, a 10-megawatt unit owned by Pacific Gas & Electric. Direct-use of geothermal energy for aquaculture, health spas and district heating continues to grow, as do installations of geothermal heat pumps.

GREEN: Green is a term used to imply that a service, product, or technology is environmentally friendly (i.e. sustainable).

GREEN BUSINESS: Green businesses operate in ways that solve, rather than cause, both environmental and social problems. These businesses adopt principles, policies, and practices that improve the quality of life for their customers, their employees, communities, and the environment.

Appendix A: Glossary of Terms

GREEN ECONOMY: A rapidly growing billion-dollar sector that includes renewable energy sources, organic produce and products, green buildings, alternative fuel vehicles, and more.

GREEN-COLLAR JOB: A paid position providing environmentally-friendly products or services; term suggests high standards regarding fair wages, equal opportunity and healthy working conditions; employer may be a private business, government, non-profit or cooperative. For example: organic farmer, sustainable forestry worker, recycling technician or solar panel manufacturer.

GLOBAL WARMING: An increase in the near surface temperature of the Earth. Global warming has occurred in the distant past as the result of natural influences, but the term is today most often used to refer to the warming some scientists predict will occur as a result of increased anthropogenic emissions of greenhouse gases.

GLOBAL WARMING POTENTIAL(GWP): An index used to compare the relative radiative forcing of different gases without directly calculating the changes in atmospheric concentrations. GWPs are calculated as the ratio of the radiative forcing that would result from the emission of one kilogram of a greenhouse gas to that from the emission of one kilogram of carbon dioxide over a fixed period of time, such as 100 years.

GOVERNMENT-OWNED STOCKS: Oil stocks owned by the national government and held for national security. In the United States, these stocks are known as the Strategic Petroleum Reserve.

GREENHOUSE EFFECT: The result of water vapor, carbon dioxide, and other atmospheric gases trapping radiant (infrared) energy, thereby keeping the earth's surface warmer than it would otherwise be. Greenhouse gases within the lower levels of the atmosphere trap this radiation, which would otherwise escape into space, and subsequent re-radiation of some of this energy back to the Earth maintains higher surface temperatures than would occur if the gases were absent.

GREENHOUSE GASES: Those gases, such as water vapor, carbon dioxide, nitrous oxide, methane, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride, that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface. Greenhouse gases include nitrous oxide, methane, fluorocarbons, and carbon dioxide (the most prevalent greenhouse gas). For more information, see http://www.epa.gov/climatechange/emissions/index.html.

GREENHOUSE GAS ABATEMENT COST CURVE: a graphic from a McKinsey study that shows the costs and and corresponding reductions of carbon dioxide emissions of certain technologies. On the left side of the graphic, many of the technologies have negative costs. To see a copy of the graphic, go to this website: http://www.economist.com/blogs/democracyinamerica/2010/02/energy_policy.

GREENWASHING: Greenwashing is a superficial nod to the environment that marketers and businesses that historically were not interested in sustainable concerns, are doing in order to improve their public relation standings with the consumer or public. Analogous to brainwashing. Don't be fooled by dishonest companies employing greenwashing techniques.

Appendix A: Glossary of Terms

GOING GREEN: A phrase referring to individual action that a person can consciously take to curb harmful effects on the environment through consumer habits, behavior, and lifestyle.

HYDROELECTRIC POWER: The use of flowing water to produce electrical energy.

HYDROFLUOROCARBONS (HFCs): A group of man-made chemicals composed of one or two carbon atoms and varying numbers of hydrogen and fluorine atoms. Most HFCs have 100-year Global Warming Potentials in the thousands.

INDOOR AIR QUALITY: The air quality inside a home or business. Pollution can happen inside too and can make people sick. The EPA recommends that people eliminate pollutant sources (like **VOCs**, and smoke), improve ventilation, and use devices that clean air inside. For more information, see http://www.epa.gov/iaq/iaqhouse.html.

KYOTO PROTOCOL: The result of negotiations at the third Conference of the Parties (COP-3) in Kyoto, Japan, in December of 1997. The Kyoto Protocol sets binding greenhouse gas emissions targets for countries that sign and ratify the agreement. The gases covered under the Protocol include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride.

METHANE: A colorless, flammable, odorless hydrocarbon gas (CH_4) which is the major component of natural gas. It is also an important source of hydrogen in various industrial processes. Methane is a greenhouse gas.

MICROCREDIT (MICROLOANS) – "Programs that extend small loans to very poor people for self-employment projects that generate income, allowing them to care for themselves and their families," (The Global Development Research Center). Loan sizes generally range between $50 and $150 dollars but can reach higher amounts for graduated, business startup loans. Microloans are used for working capital in the purchase of raw materials and goods for the microenterprise, as capital for construction, or in the purchase of fixed assets that aid in production, among other things.

MICROENTERPRISE : A small-scale business in the informal sector that often employs less than people and can be based out of the home. Microenterprise is often the sole source of family income but can also act as a supplement to other forms of income. Examples of microenterprises include small retail kiosks, sewing workshops, carpentry shops and market stalls

NITROGEN OXIDES (NO_x): Compounds of nitrogen and oxygen produced by the burning of fossil fuels.

NITROUS OXIDE (N_2O): A colorless gas, naturally occurring in the atmosphere. Nitrous oxide has a 100-year Global Warming Potential of 310.

NONRENEWABLE FUELS: Fuels that cannot be easily made or "renewed," such as oil, natural gas, and coal.

PASSIVE SOLAR HEATING: A solar heating system that uses no external mechanical power, such as pumps or blowers, to move the collected solar heat.

Appendix A: Glossary of Terms

PETROCHEMICALS: Organic and inorganic compounds and mixtures that include but are not limited to organic chemicals, cyclic intermediates, plastics and resins, synthetic fibers, elastomers, organic dyes, organic pigments, detergents, surface active agents, carbon black, and ammonia.

PETROLEUM: A broadly defined class of liquid hydrocarbon mixtures. Included are crude oil, lease condensate, unfinished oils, refined products obtained from the processing of crude oil, and natural gas plant liquids. *Note:* Volumes of finished petroleum products include nonhydrocarbon compounds, such as additives and detergents, after they have been blended into the products.

PHOTOVOLTAIC CELL (PVC): An electronic device consisting of layers of semiconductor materials fabricated to form a junction (adjacent layers of materials with different electronic characteristics) and electrical contacts and being capable of converting incident light directly into electricity (direct current).

RENEWABLE ENERGY: Energy obtained from sources that are essentially inexhaustible, unlike, for example, the fossil fuels, of which there is a finite supply. Renewable sources of energy include wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

SOLAR THERMAL PANELS: A system that actively concentrates thermal energy from the sun by means of solar collector panels. The panels typically consist of fat, sun-oriented boxes with transparent covers, containing water tubes of air baffles under a blackened heat absorbent panel. The energy is usually used for space heating, for water heating, and for heating swimming pools.

SUSTAINABILITY: The best known definition for sustainability is from the Brundtland Commission (formerly the World Commission on Environment and Development). This suggests that development is sustainable where it "meets the needs of the present without compromising the ability of future generations to meet their own needs." Net Impact uses this term specifically to focus on environmental initiatives, and we address economic and social issues under the International and Community Development umbrella.

SUSTAINABLE LIFESTYLES: A lifestyle that could, hypothetically, be sustained unmodified for many generations without exhausting any natural resources. The term can be applied to individuals or societies. Its adherents most often hold true sustainability as a goal or guide, and make lifestyle tradeoffs favoring sustainability where practical. Most often these tradeoffs involve transport, housing, energy, and diet.

TRIPLE BOTTOM LINE: a term used to describe sustainability practices. Traditionally, people use the term “the bottom line” to refer to sustaining profits in a business. The Triple Bottom Line approach has three Ps: people, planet, and profit. Businesses that use the Triple Bottom Line approach seek to have economic, social, and environmentally sustainable practices.

VOLATILE ORGANIC COMPOUNDS (VOCS): Organic compounds that participate in atmospheric photochemical reactions.

WIND ENERGY: Kinetic energy present in wind motion that can be converted to mechanical energy for driving pumps, mills, and electric power generators.

WIND FARM: See **WIND POWER PLANT** below.

Appendix A: Glossary of Terms

WIND POWER PLANT: A group of wind turbines interconnected to a common utility system through a system of transformers, distribution lines, and (usually) one substation. Operation, control, and maintenance functions are often centralized through a network of computerized monitoring systems, supplemented by visual inspection. This is a term commonly used in the United States. In Europe, it is called a generating station.

WIND TURBINE: Wind energy conversion device that produces electricity; typically three blades rotating about a horizontal axis and positioned up-wind of the supporting tower.

For more energy and environment terms please visit:
http://www.cleanedge.com
http://www.eia.doe.gov/glossary/index.html
http://www.epa.gov/climatechange/emissions/index.html.
http://www.ieta.org
http://www.lohas.com/glossary.html#g

Appendix B: Duke Sustainability Coordinator Job Description

Job Description for Sustainability Coordinator
Title: Sustainability Coordinator
Department: Office of the Executive Vice President
Job Code: 2321
Level: 10
FLSA: Exempt

Occupational Summary:
The Sustainability Coordinator will develop, coordinate and administer programs and advise policies within the area of sustainability at Duke University.

Responsibilities:

- Develop, plan, coordinate and implement activities including, but not limited to, seminars, conferences, workshops, short courses, clubs, shows, public events and other programs related to sustainability at Duke. Both the manner in which these activities are organized and the nature of their content should be geared towards achieving buy-in and habit transformation from student, faculty and staff community members.
- Encourage and facilitate sustainability programs initiated by student, faculty and staff community members. Foster and coordinate new ideas and concepts for sustainability programming themes and identify materials and resources to supplement, expand or replace existing sustainability programming.
- Assist the Executive Vice President in defining goals, performance metrics and a long range plan for sustainability at Duke. Monitor and evaluate program effectiveness, document performance trends, and recommend and implement modifications to improve program effectiveness.
- Represent Duke's sustainability programs to the University; maintain liaison with groups, programs, offices and departments at Duke to achieve sustainability objectives; serve on various committees, such as the Environmental Management Advisory Committee (EMAC) and the Environmental Management System Committee.
- Represent Duke's sustainability programs to the public; attend professional meetings as appropriate; interface with external organizations to ensure cooperative efforts are enhanced and available resources are utilized. These requirements necessitate the ability to travel and meet regularly outside of business hours.
- Coordinate and/or participate in public relations activities to include preparing and supervising the production of a website, brochures, newsletters and other promotional materials and/or publications, preparing press releases, designing ads and fliers, and responding to inquiries; develop plans and schedules for release of publicity materials.
- Research and maintain working knowledge of best practices at peer institutions with regards to sustainability.
- Design and maintain a "clearinghouse" website for sustainability-related news at Duke.
- Assist in the preparation of budgets and grants; monitor, verify and reconcile expenditure of budgeted funds as appropriate.
- Recruit, interview, hire and manage student interns performing research or work on sustainability projects with well-defined deliverables.
- Advertise, solicit and screen applications for the Green Grant Fund. Oversee the execution of projects receiving grants. Publicize the results of granted projects.
- Perform other related duties incidental to the work described herein.

Appendix B: Duke Sustainability Coordinator Job Description

MINIMUM HIRING SPECIFICATIONS
SUSTAINABILITY COORDINATOR
Job Code 2321, Job Level 10, Job Family 28

EDUCATION & TRAINING
Work requires analytical, communications and organizational skills generally acquired through completion of a bachelor's degree program.

EXPERIENCE
Work requires experience in program administration and knowledge of the University community necessary to plan, coordinate and implement a variety of program activities and events across schools and departments. Work requires excellent analytical, communication and organization skills; an ability to self-motivate, multi task and to work in a fast-paced environment; to work under deadlines; and the ability to work closely with students, faculty and administrators from various schools and central administration.

Appendix C: Eco-Reps Job Application

JCSU Eco-Representative
Application Form 2011-2012

Name _____ Class in 11-12 School Year _____

Residence House _____

Home Address _____
Street/Apt. City/State Zip

Home Phone (H) _____ Cell Phone (C) _____

Campus Address _____

Campus Phone _____ Email _____

Do you have Federal Work-Study job eligibility for 2011-2012? _____
*Work-Study is not required.

Reference Name and Phone No. _____

Description

The Eco-Representatives (Eco-Reps) program is designed to encourage environmental education and to help students recognize the systemic nature of environmental problems and their solutions. This will be JCSU's first year implementing the Eco-Reps program. Eco-Reps are residents in the housing system act as "peer educators" and teach other students the information and skills they need to live in a more sustainable way.

Responsibilities include attending scheduled educational sessions, talking to students about environmental issues, conducting surveys, hanging up posters, passing out or emailing out information, and organizing events based on a specific theme. Each Eco-Rep will be given guidance during mandatory training sessions throughout

the year in which they will be introduced to a topic related to that month's theme and brainstorm actions that they could take back to their own residence house. The goal is that each residence house will find its own way to respond to the theme and its own best solution. For example, if the theme were reuse, Ingram House could create its own swap meet or donation collection point.

JCSU Eco-Reps will not be monetarily compensated for commitment but will receive a free meal during mandatory training events and will learn valuable environmental information. They will also become environmental leaders among their peers, learn more about how Johnson C. Smith University works, meet new people, and gain valuable leadership and facilitation experience.

Potential Themes

September – Energy Conservation
October – Green Building
November – Recycling, Reducing, Reusing
December – Consumption
January – Climate Change
February – Food and Dining Choices
March – Transportation
April – Water Conservation

The Ideal Candidate

Personal Qualities

- Interested in making residence houses more resource efficient and in learning about environmental issues and social marketing.
- Kind, friendly, creative, and fun to work with.
- Proactive, independent, good time manager, and reliable.
- Passionate, committed, and willing to go the extra mile.
- Comfortable interacting with residents, administrators, and staff.
- Happy to be a visible personality and think up creative ways to get your message across.

Availability

- Prioritizes participation in JCSU Eco-Rep events, including regularly scheduled group meetings, but not at the expense of coursework.
- Available on additional evenings each semester to help plan at least one of the group meetings and prepare campaign materials for one of the meetings.
- Available for group projects scheduled throughout the semester. Also available for several group work sessions during the year.

Written Work

- Reads and responds to time-sensitive emails ASAP during the year.
- Comfortable using up-to-date, PC-compatible versions of Microsoft Word and Excel as well as social networking sites such as Facebook and MySpace.
- Committed to completing written reports fully and on time.

Residency Requirements

- Resident of House represented.
- Committed to this position for both fall and spring semesters. (Let us know if you are considering study abroad/leave for a semester.)

Appendix C: Eco-Reps Job Application

Questions

Please answer each of the following questions thoughtfully. Responses should be no longer than 200 words.

1. Why are you interested in becoming an Eco-Rep? What qualifications, previous experience, skills, passions, and interests would
2. you bring to this position that will contribute to program development and growth?
3. The Eco-Reps Program is dedicated to promoting *environmental literacy* and *environmentally and/or socially responsible behaviors*. What do these terms mean to you and how do you see yourself using these concepts in the work you do as an Eco-Rep?
4. Pick one theme from above and explain how you would execute a program/event for your residence hall? What small steps do you think students can take to reduce their environmental impact with regards to this theme?
5. The Eco-Reps Program seeks motivated individuals who can work both collaboratively and independently and see projects through to completion. Please describe a situation from your past that shows your ability to work in these ways. Also, how do you define leadership in the context of an Eco-Rep?
6. How do you feel about talking one-on-one to people you have never met? Are you comfortable speaking in public?
7. What do you think your major will be and why?
8. Do you have any past experience with environmental issues or concerns or with volunteer activities? If so, please describe.

Please send completed application to Sustainability Coordinator

Appendix D: Example Homeowners Manual Outline

Homeowners Manual Outline

1) Important Phone Numbers
2) Warranty Coverage
    1. Manufacturer Warranties, Manuals
    2. How to Request Warranty Service
    3. Homeowner Responsibility
3) Maintenance Guidelines
    1. Air Conditioning and Heating System
        (1) Thermostat
    2. Appliances
        (1) Dishwasher
        (2) Disposals
        (3) Microwave Oven
        (4) Ovens/Ranges
        (5) Refrigerator
        (6) Washer/Dryer
    3. Bath Tubs, Sinks, and Showers
    4. Blinds
    5. Cable TV
    6. Cabinetry
    7. Carbon Monoxide Detector
    8. Carpet
    9. Ceramic Tile
    10. Condensation
    11. Countertops
    12. Doors
    13. Drains
    14. Electrical System
    15. Faucets
    16. Floors
    17. Garages/Carports/Driveways
    18. Hardware

19. Hardwood Flooring
20. Insulation
21. Landscaping
22. Lighting
23. Mildew
24. Mirrors
25. Patios/Outdoor Spaces
26. Paint
27. Plumbing
28. Screens
29. Smoke Detectors
30. Stainless Steel
31. Telephone
32. Toilets
33. Trim and Molding
34. Vinyl Flooring
35. Vitreous China and Porcelain Enamel
36. Walls
37. Water Heater
38. Windows

4) Final Homeowner Tips
5) Routine Maintenance and Prevention Checklist
6) Additional Information to be inserted as needed

Appendix E: Student and Faculty/Staff Survey Results

Student Go Green Survey Results

The following section shows the questions of the Go Green Survey for Faculty and Staff and the responses to these questions. The results of multiple choice demographic and sustainability questions are depicted in figures. The results to open-ended responses are shown in tables with broad categorizations of the types of concerns that these responses express. One hundred and thirty-eight students responded to this survey.

1. How are you affiliated with Johnson C. Smith University?
   Summary of results: 28 students identified as first year students, 32 respondents identified as second year students, 48 respondents identified as third year students, and 31 respondents identified as fourth year students as seen in Figure 1 below.

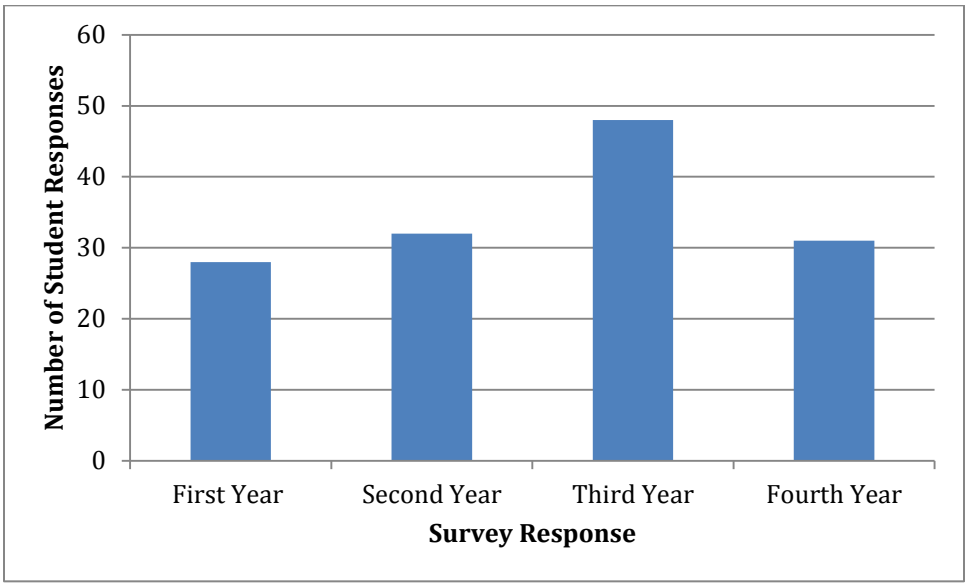

Figure 1: Figure showing the year of respondents to the Student Go Green Survey

2. What is your gender?

Summary of results: 30 respondents identified as male, 111 respondents identified as female as shown in Figure 2 below.

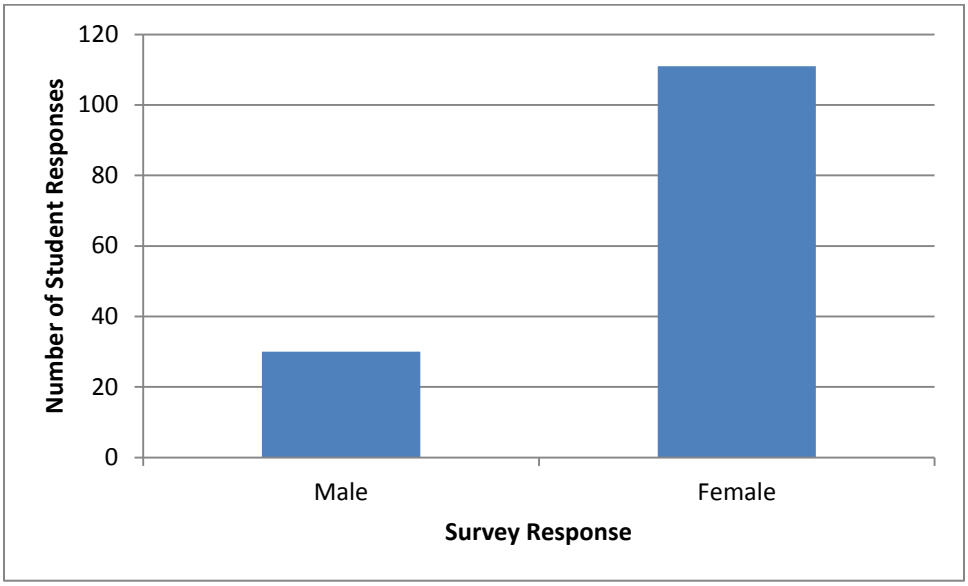

Figure 2: Figure showing the gender of respondents to the Student Go Green Survey

3. Are you a student in the Metropolitan College?

Summary of results: 13 respondents were students in the Metropolitan College, 128 respondents were not in the Metropolitan College, as shown in Figure 3 below.

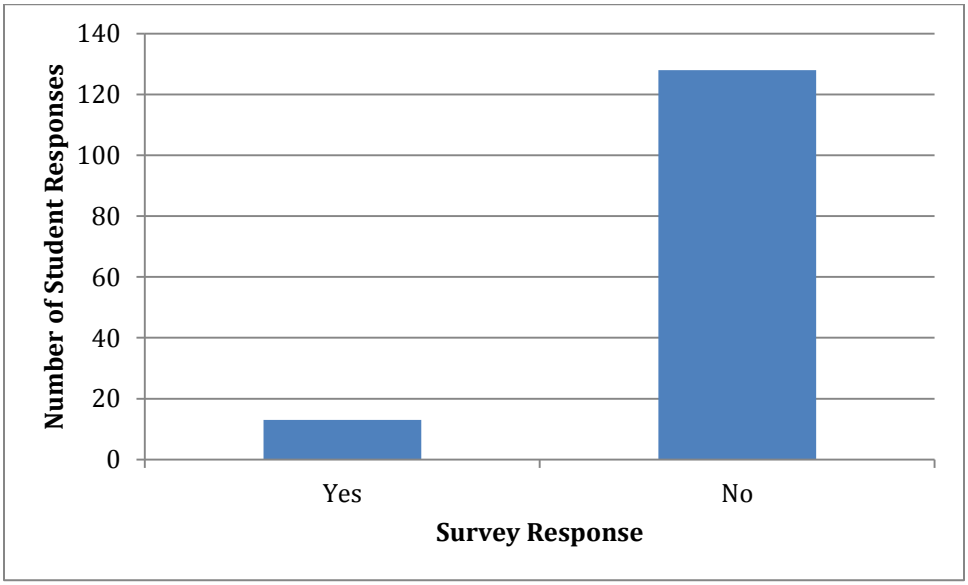

Figure 3: Figure showing the number of student respondents to the Go Green Survey were in the Metropolitan College

4. In what areas does Johnson C. Smith University use sustainable practices most effectively?

Summary of results: 52 students indicated recycling, 18 students indicated procurement, 32 students indicated dining, 34 students indicated energy use and efficiency, 28 students indicated transportation, 18 students indicated waste management, and 30 students indicated water management in their responses to this question (see Figure 4). Note: students could indicate more than one response.

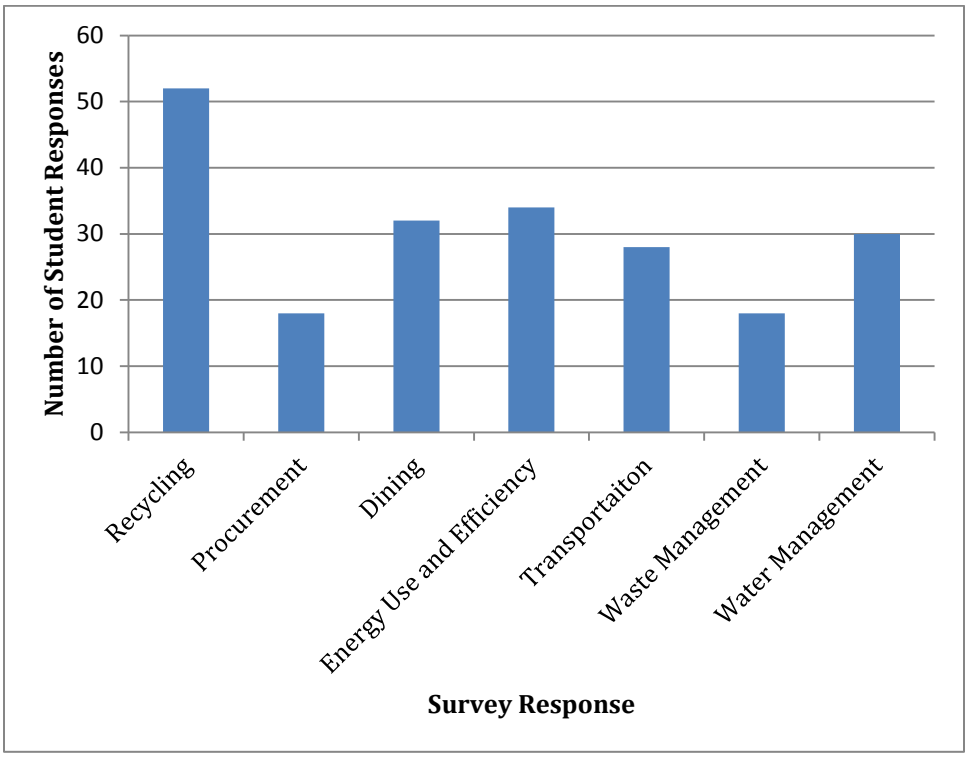

Figure 4: Figure showing what areas student respondents believe JCSU is strongest in campus sustainability

5. In what areas can Johnson C. Smith most improve its sustainability practices?

Summary of results: 74 students indicated recycling, 58 students indicated procurement, 68 students indicated dining, 56 students indicated energy use and efficiency, 41 students indicated transportation, 52 students indicated waste management, and 34 students indicated water management in their responses to this question (see Figure 4). Note: students could answer with more than one response.

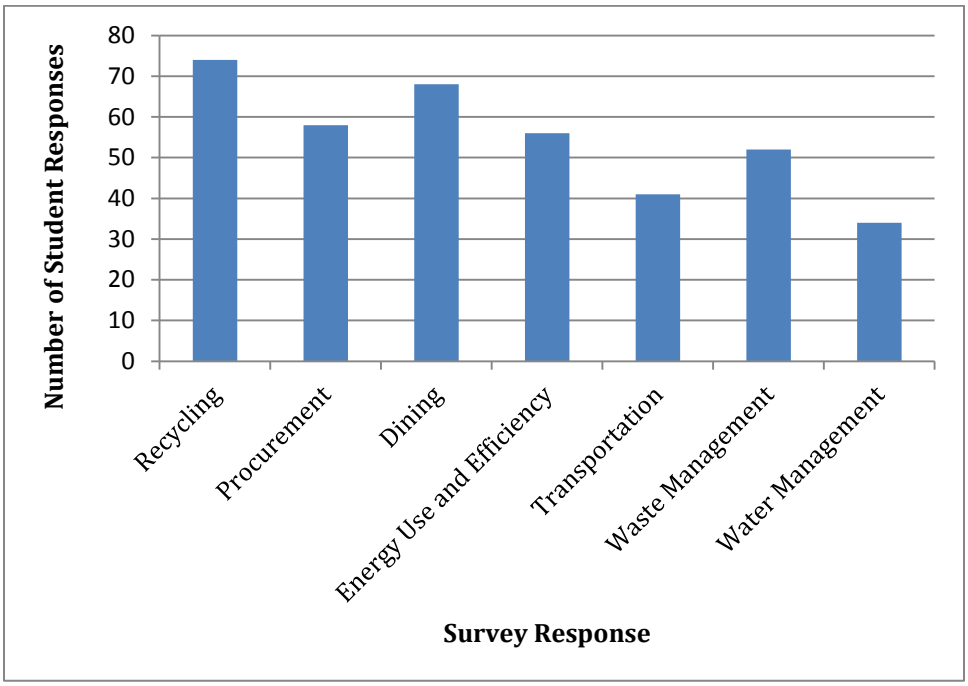

Figure 5: Figure showing where student respondents believe JCSU can improve the most in sustainability

6. Please provide any specific comments about the areas listed above or any other areas where JCSU can improve sustainability practices.

Text Responses	Category of Response
Water efficiency. The water must be tested for lead.	Water
Dining areas are terrible the new chairs are not very sturdy and also there are not alot of seating for the student	Dining
Need recycling bins around campus	Recycling
There aren't any recycling bins on campus, and if they were available then maybe people would recycle more.	Recycling
Anything to increase student involvement.	Student involvement
Dining areas more choices to eat and better food	Dining
JCSU can improve sustainability practices in the resident halls on campus.	Built environment

There should be more recycling practices going on around campus. More environmental friendly products should be being used. Better foods should be served to reduce food waste in the cafeteria.	Recycling, dining
More campus shuttles to frequent off campus locations to reduce gas emissions.	Transportation
The school doesn't do much of anything pertaining to sustainability.	General
MORE RECYLING BINS	Recycling
I believe JCSU need to have better customer service in the bookstore, admissions and the receptionist in Metropolitan College to improve sustainability practices.	General
We need more recycling bins here at JCSU in the dorms. They need to be accessible to students, so that people like me and my roomate who actually want to recycle, won't have to search all over campus to find recycling bins. That was one of the first things that I noticed when I got to JCSU as a freshman last year.	Recycling
Separating recycleable items from trash	Recycling
The dining has changed so much and has not been for the better. This is the first project that should be handled.	Dining
I am apart of the campus pride committee and i believe that in order to make the school a better environment an campus wide go green campaign needs to be in effect. In the same way that the school stresses surrounding yourself with success, they need to also encourage keeping the campus clean.	Awareness
In the dining area I feel that there should be certain utensils used to clean the stoves. Most of the time the spatula used to make burgers is the same spatula used to clean the grime off the stove, which is not sanitary because of the metal that may be picked up on the spatula.	Dining
Bascially more garage cans can be used around the schools an things..	General
They are doing well but can always improve	General
Place recycling bins in various places on campus beside the trash cans so that students have somewhere to place their recyclables instead of them throwing them in the trash.	Recycling
Put recyling bins around campus! Use less energy if possible.	Recycling

Encourage students to respect the environment, the quality of our school and to GO GREEN! even the Cafe' using plates and eating utensils saves water. it produces a large amount of trash.	
JCSU can also enforce limiting the submission of hard copy student work to save paper.	Waste reduction
JCSU has a lot of work to do! To be honest the laundrey room is the best area I can see JCSU working on as far as sustainability issues. The paper cups and plates in the café as well as silverware sets the tone of the environment. Recycling in certain areas around campus just to say we do our part is not enough! I personally would like to see MORE! More can be done such as recycling in dormotories, eliminating the paper usage in the caf., better water pressure throughout the dormotories, more carpooling to handle everyday needs ie: banking (since we do not have a bank on campus such as most Universities), getting personal hygiene products, obtaining food, and such. All in all JCSU has a long way to go & I would love to see it get there however I have very little faith in any efforts because I simply believe certiain people just do not care. As for now I can only hope to see a change.	Recycling, waste reduction, dining
we should have recycling bins because a lot of people drink soft drinks, and it could help to have bins to put our cans and out plastic bottles instead of the trash cans.	Recycling
Smith should put up different recycle bins in the Residence Halls because there are alot of students that like to recycle but they do not have a way to do so.	Recycling
JCSU does not leave the proper containers to recycle. we also use paper plate every day. we use multiple buses rather than one or two large ones Lights are left on overnight in some areas of campus. There are no recycling options for students.	Recycling
There needs to be recycling bins throughout campus for students to use. Also can put up flyers and share the importance of cutting back on water and electricity use.	Recycling
There should be more food options in the cafeteria and more stations open. There is not enough waste bins on campus and no recycling.	Dining and Recycling
They can put more recycling bins and signs labeling those bins around campus. There may be a lot of recycling already done on campus, but the advertisement of that fact is	Recycling

completely lost to the students. Even having a recycling bin in our dorm halls would make recycling easier.	
I believe that JCSU could truly begin the Go-Green process by first getting bio-degradable dining wear in the cafe, and Student Union. All products that are used are Styrofoam and non biodegradable. Also the school could place recycle bins in each residence hall also in each suite in new residence hall.	Dining
Get better food...	Dining
If portions of the residence halls are updated and include energy efficent utilities it would benefit the school and the environment JCSU can do a better job when it comes to buying products that are considered sustainable.	Built Environment/ Energy Efficiency
we do not have enough places on campus where we can recycle bottles, cans and paper items	Recycling
Some of the energy cost could be cost by using power saving bulbs inside residence halls and faculty areas	Built Environment/ Energy Efficiency
I think JCSU cafe should have longer hours and have a better selection of food.	Dining
Lights in dormitory can be automatically turned off at a certain time during the day or night.	Built Environment/ Energy Efficiency
Establishing more recycle centers/areas and maintaining the existing recycle bins. There are some bins around campus that have waste in them or have not been emptied in a long time.	Recycling
we should have bins where we can recycle items.	Recycling
There should be more recycling practices going on around campus. More environmental friendly products should be being used. Better foods should be served to reduce food waste in the cafeteria.	Recycling
JCSU can improve its sustainability practices by recycling more. I rarely see how JCSU recycle here on campus.	Recycling
We use styrofoam plates and cups constantly which products more waste. They do not provide proper containers to recycle in the cafeteria. The lights are always on. We use multiple buses rather than jus one large bus for transpotration	Dining and Transportation
I believe that JCSU Should improve on transportation	Transportation

This school is great at picking up the trash and cutting and cleaning the grass out side	General

Table 1: table showing student responses to question about JCSU's current sustainability practices

7. Would you read publications or fliers that gave students ideas for living and working in a more environmentally sustainable way?

Summary of results: 116 students said yes and 21 students said no in response to this question (see Figure 6).

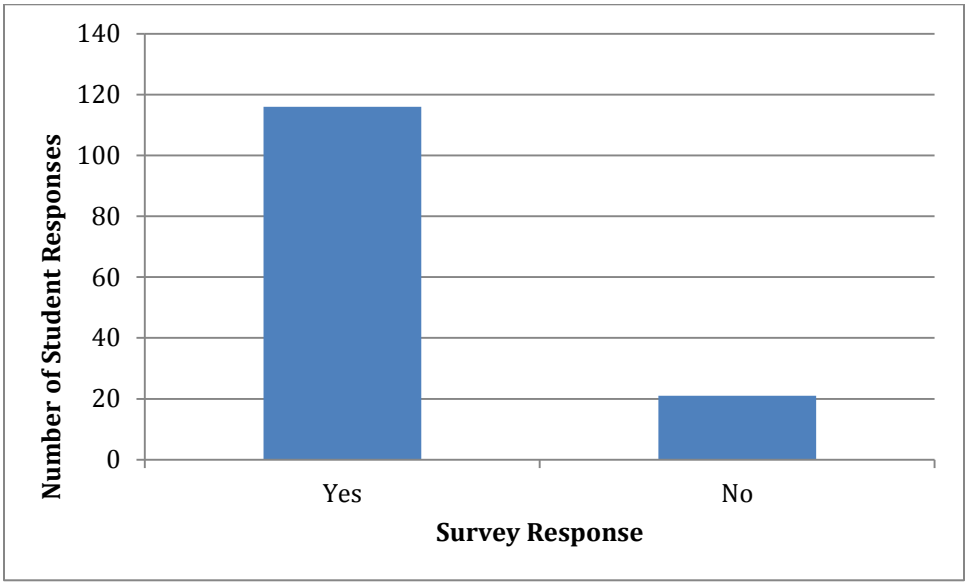

Figure 6: Figure showing whether students indicated if they would read sustainability publications

8. Would you use a JCSU website that provided ideas for living and working in a more environmentally sustainable way?

Summary of results: 119 students said yes and 19 students said no in response to this question (see Figure 7).

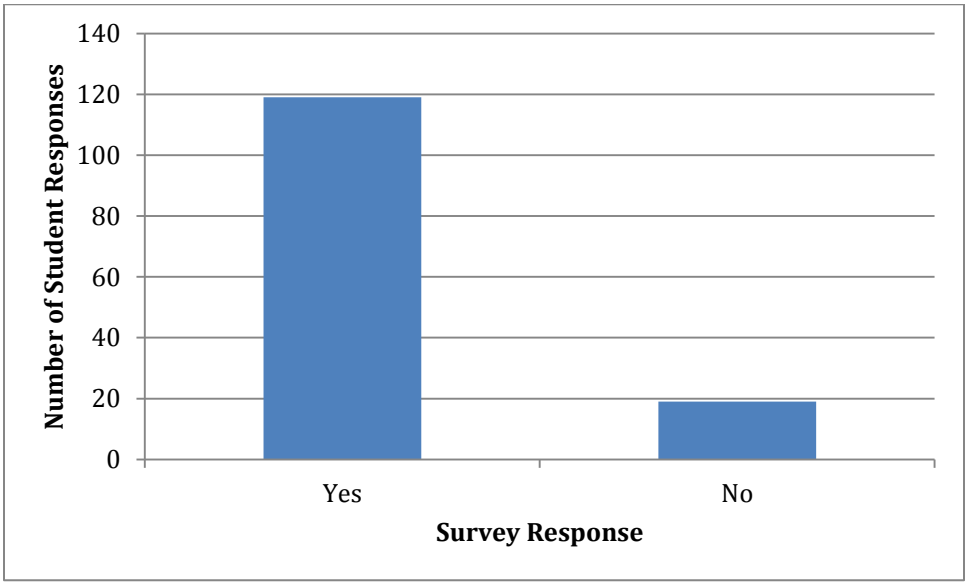

Figure 7: Figure showing whether student respondents would use a sustainability website

9. Do you like the ideas of friendly competitions among dorms or classes to be more environmentally sustainable?

Summary of results: 124 students said yes and 12 students said no in response to this question (see Figure 8).

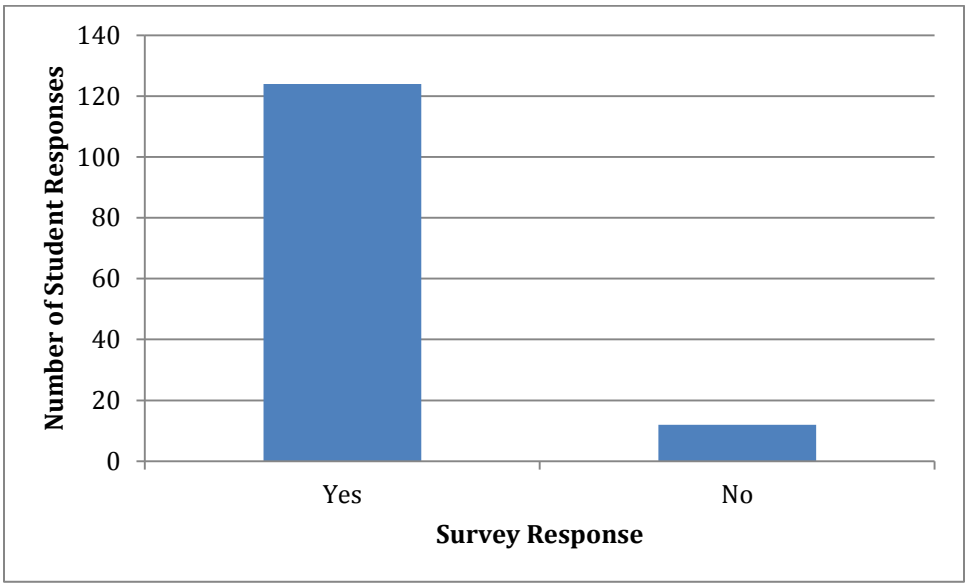

Figure 8: Figure showing whether student respondents would be interested in sustainability competitions

10. Do you like the idea of having green representatives in each class or in different student organizations who can serve as environmental sustainability resources?

Summary of results: 118 students said yes and 20 students said no in response to this question (see Figure 9).

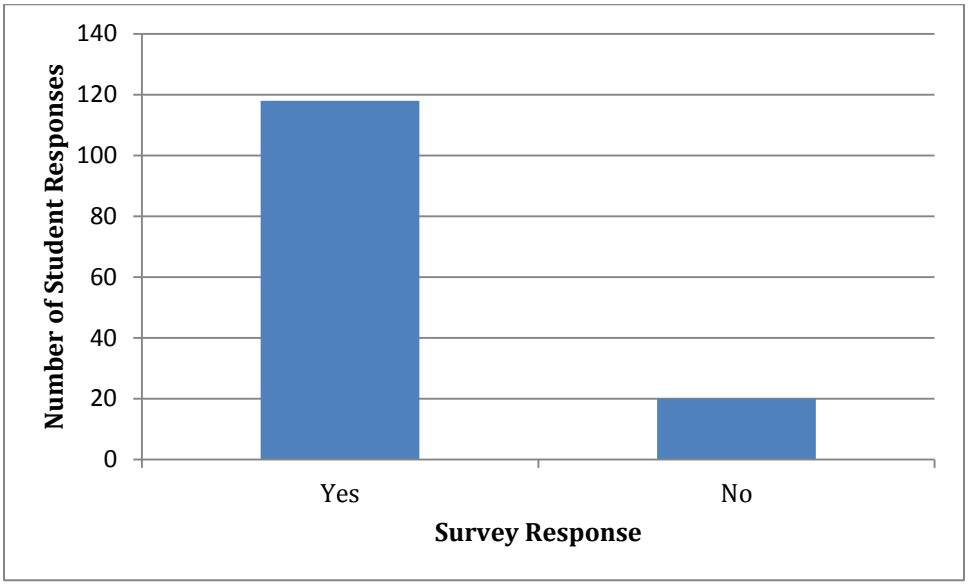

Figure 9: Figure showing whether student respondents would be interested in sustainability competitions

11. Please provide any specific comments about the activities suggested and any other activities around the theme of environmental sustainability that you would be interested in participating in on campus.

Text Responses	Category of Response
The friendly competitions among dorms would enable dorms to remain clean as they are not presently.(most)	Competitions
the friendly co petitons will be a nice idea	Competitions
I think the dorm competitions would really get students motivated.	Competitions
I think it would be a good idea to have student representatives promoting living in a less polluted and cleaner environment. And friendly competition between dorms, organizations, students, etc. will be a very good idea. Prizes can be rewarded as motivation for the students to participate. And other programs as such, will I be interested in being a part of.	Student Representatives
a like a little friendly competition with rewards	Competition
the competition will encourage students to recycle more and be more aware of their waste and where its going	Competition

More off campus lyceums, maybe improving school laws, or helping the nursing home.	Campus Lyceums
A CLEANUP CREW LIKE FOR COMMUNITY SERVICE AND THINGS ETC...	Community Service
Anything that encourages student involvement with recycling I would love to be apart of!	Recycling
getting the information to the students is half the battle. there must be follow ups with student to see if they are really practicing going green techniques.	Communication
I planned and carried out my own recycling program throughtout New Res and I got positive feedback! I feel like this is something that should have been done & there is no need to waste time & money on fancy publications and such when it is truely a lifestyle change! I feel like each student has to be educated on the subject first before any change will take place & lets be honest not many students here at JCSU take the time to read anything they benefit most from presentations(which they are reuired to go to) where they can see the benefit of living in such a way! This type of excitement is PAST OVERDUE however it cannot be implemented in such a way as to where the students are only doing it for an reward because as my project proved it is a lifestyle change & the reward gets old.	Recycling, Student Involvement
Personally I have the privilege of knowing some one that if very green oreinted. She likes everything to be recycled and I believe if the students were informed out the assistance they would be giving to the environment there would not be a problem with friendly competition.	Recycling, Student Involvement
Please don't hand out fliers regarding green practices. It will be a waste of paper.	Waste Management, Communication
What ever is done it has to be creative enough for all students to want to participate in.	General
That is a great idea to get everyone involved on campus	General
ADVERTISING IT KEY!!!	Communication
Have more class v. class type events such as who has the best spirit or sports activities...	Competitions

Just making sure recycle bins are always available and possibly going around to collect it.	Recycling
The Greeks on campus could be utilized to promote an activity for enviormental sustainability with the school and allow them to work hand and hand on this initative	Greek Involvement
I like how the campus is trying to make a difference in what we do not have.	General
I have an suggestion. Will your organization be able to sponsor an organzation on campus created by jcsu students trying build an department, increase our business and also increase yours as well. We be able to sponsor yall on our websites that we created. Then later on if your interested we can have some events and things to support other events on campus.	Student Involvement
The idea of having friendly competition is a good idea because students today is very competitive.	Competition
They should have an environmental club or group and more community service dealing with the environment	Student Involvement

Table 2: table showing student responses to question about what types of events they think would help promote sustainability on campus

12. What sustainability-focused events would you be interested in attending on campus?

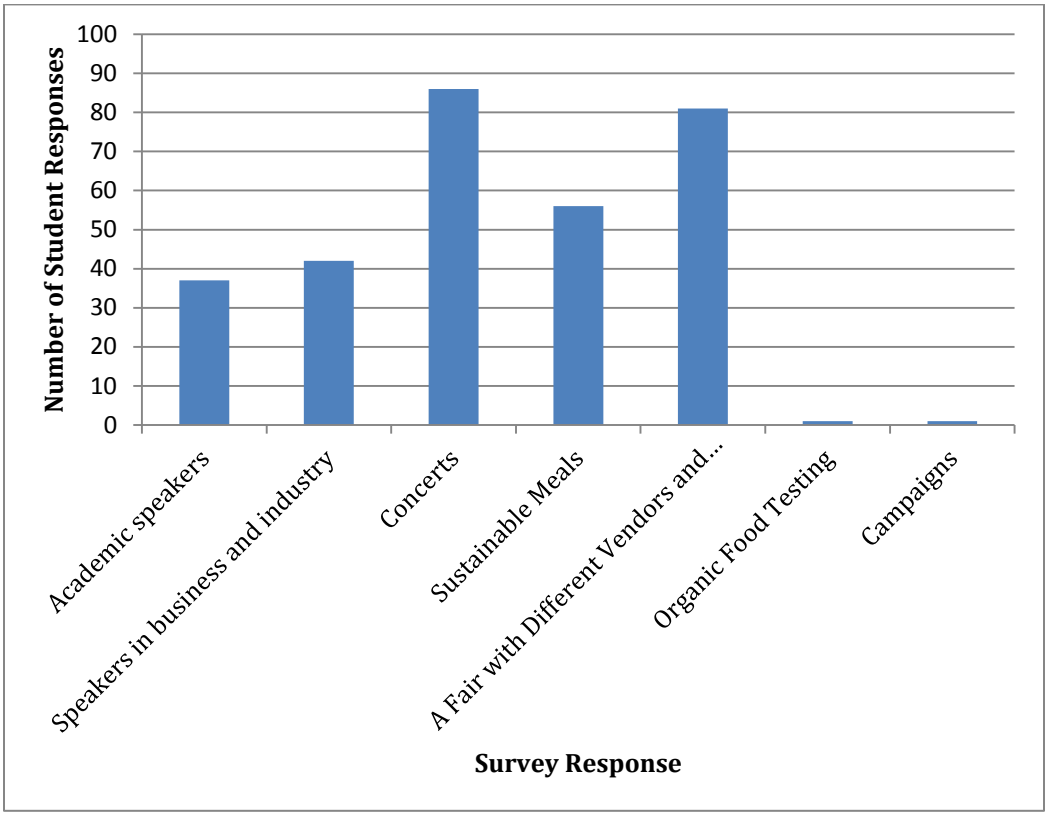

Figure 10: Figure showing what types of sustainability programming students would be interested in participating in on campus (note: organic food testing and campaigns are write on responses from the Other response in the survey)

13. Please use this area to provide any specific comments on events that you would be interested in participating in on campus.

Text Responses	Category of Response
The academic speakers would be a good approach as they would provide tips on how to balance and do well.	Sustainability Speakers
speakers in business and industry	
I think a fair would be fun for everyone and it would allow people to purchase eco-friendly items.	Sustainability Fair
Activities where gifts and prizes are given will be fun for students to learn information and become involved in projects.	General
Any activity.	General
More HIV/AIDS/STDs Awareness	Social Sustainability

Use hands on deminstartions to show the student how practing more stainable activties actually has a huge postive effect.	General
A Going Green Fair would grab students attention because different recycling organizations can inform students about different issues with our environment today.	Sustainability Fair
A CONCERT THAT HAS THINGS TO DO WITH SUSTAINABLE... Anything that makes students interested and aware and gets them to actively participate is a plus!	Concert
i love the idea of compositions between the different dorms to see who can be the most green.	Dorm Competitions
I dont feel as if events will benefit me!	General
a contest between dorms of going green.	Dorm Competitions
A fair that discusses different green activities sound attractive because I like to see what I am apart of and the different avenues that are being taken to help and what can make it fun.	Sustainability Fair
Go Green Lyceum events would be a good way to get more participants. Also Go Green community service projects. The current Junior Class Council had community service projects where they planted trees and cleaned up a stream.	Lyceum Events and Community Service
Successful greek members coming back to tell they're stories. People from different majors.	Sustainability Speakers
If we had a block party or a go green fair with vendors and free food. People would see the difference and try to come out.	Block Party and Sustainability Fair
I would be interested in helping with any type of program of this type because I try my best to live life in a more sustainable way.	General
More music functions... Any event that would inform students of the simple ways to be more efficient and go green	Concerts

Community Serivce	Community Service
Going Green Festival	Sustainability Festival
Fraternal and Sorority events that would spike enviormenal awarness	Greek Events
I would like to do sustainable meals so that we could have better and healthier food.	Sustainable Meals
being apart of a go green booth	Sustainability Festival/ Fair
Most of the biology majors or those who are envoled with biology would def approve and would be willing to help start this project	General
I believe a concert and awareness fair would be very enjoyable as well as informative.	Concerts, Sustainability Fair
I would like to see a multiple day event...maybe like a green week	Sustainability Festival/ Fair, General
I would be interesting in attending more concerts, more events to raise school pride, game nights ect.	Concerts, General

Table 3: table showing student responses to question about what types of events they think would be interested in participating in on campus around the theme of sustainability

Faculty and Staff Go Green Survey Results

The following section shows the questions of the Go Green Survey for Faculty and Staff and the responses to these questions. The results of multiple choice demographic and sustainability questions are depicted in figures. The results to open-ended responses are shown in tables with broad categorizations of the types of concerns that these responses express. Ninety-five JCSU employees responded to this survey.

1. How are you affiliated with Johnson C. Smith University?

Summary of results: 29 survey respondents were faculty, 64 survey respondents were staff, 2 respondents were administrators.

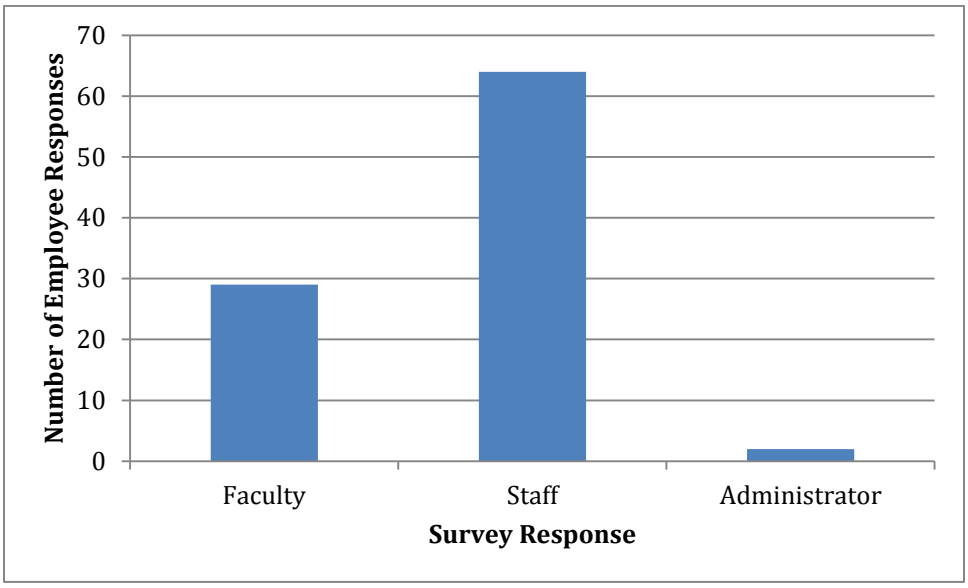

Figure 11: Figure showing the affiliation of the respondents to the Staff and Faculty Go Green Survey

2. In what areas does Johnson C. Smith use sustainable practices most effectively?

Summary of results: 67 employees indicated recycling, 10 employees indicated procurement, 13 employees indicated dining, 20 employees indicated energy use and efficiency, 7 employees indicated transportation, 13 employees indicated waste management, and 13 employees indicated water management in their responses to this question (see Figure 12). Note: faculty and staff could answer with more than one response.

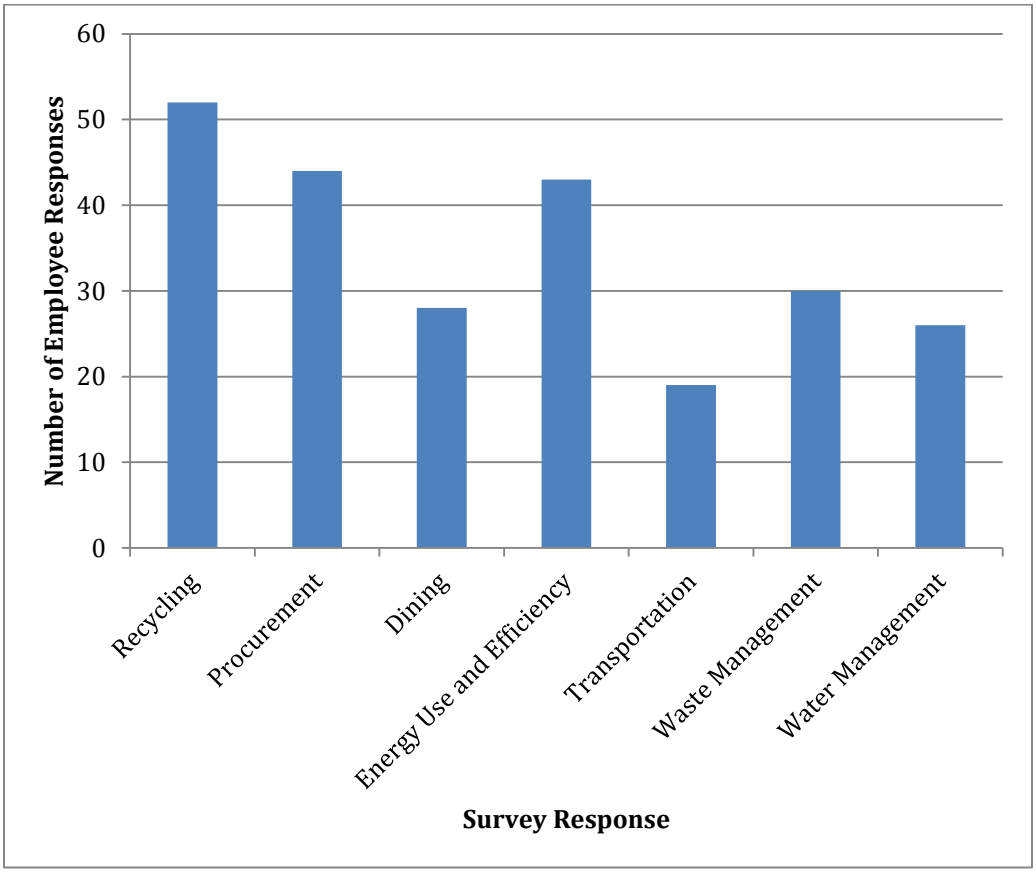

Figure 12: Figure showing what areas employees believe JCSU is strongest in campus sustainability

3. In what areas can Johnson C. Smith most improve its sustainability practices?

Summary of results: 52employees indicated recycling, 44 employees indicated procurement, 28 employees indicated dining, 43 employees indicated energy use and efficiency, 19 employees indicated transportation, 30 employees indicated waste management, and 26 employees indicated water management in their responses to this question (see Figure 13). Note: faculty and staff could answer with more than one response.

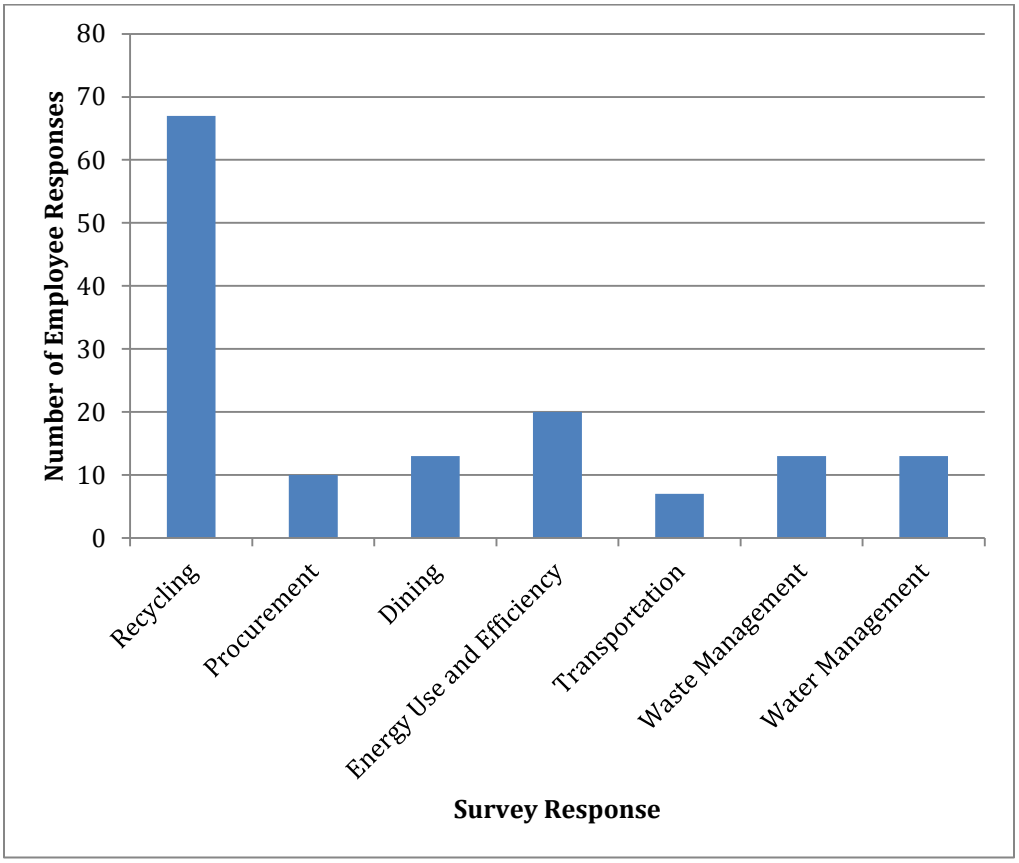

Figure 13: Figure showing areas where faculty and staff believe JCSU needs the most sustainability improvements

4. Please provide any specific comments about the areas listed above or any other areas where JCSU can improve sustainability practices.

Text Responses	Category of Response
Keep the air on the warmer side in summer and the cooler side in winter.	Built Environment/ Energy
I am not sure exactly what areas they are using the Go Green.	General
Encourage more recycling rather than just throwing away trash. Buy recycled paper, etc.	Recycling

Make recycling containers more visible, have containers emptied regularly	Recycling
I am not necessarily in the best position to judge many of our practices; these answers are at best intuitions.	General
Look into having locations in every building and design a Drop·off Center/Spot Look into outside Contractors	Recycling
During the summer the air conditioning is on full blast in the Education Building. That is not necessary. We did not get relief from it until October.	Built Environment/ Energy
Being cognizant of the fact that your "individual" energy and resource usage does matter and count against the total JCSU Team.	General, Energy
Recycle bins have been placed in office areas and they are not be disposed of properly. It appears that they are being emptied as regular trash. This is what I have observed.	Recycling
We need to work better to recycle. There also needs to be better instructions for the cleaing staff as far as recylcing. With all the planting there should be water capture or rain barrels around buildings. There could also be a community garden that supplies the dining room with vegetables. All of these projects could be built into curriculum	Recycling, Water Management, Dining, Curriculum
Most people are not utilizing the recycling bins. There has also been an issue with obtaining bins. There need to be more containers in the common areas that are specifically labeled for recycling. The cleaning products are TOXIC, I have yet to see any green cleaning products. I bring my own products from home.	Recycling, Procurement
We are putting in White boards to replace Black boards and chalk usage. Some rooms we put in lighting systems that can be used towards Go-Green credits.	Built Environment/ Energy
I have difficulty answering most of the items in #2 and #3 above because I don't have knowledge of the extent of our efforts in those areas not checked or have cornizance over such.	General
Many older buildings, such as SHA, have terribly outdated HVAC systems, which wastes energy and water.	Built Environment/ Energy
In the past the green recycling bins were in our building, due	Recycling, Water

to a stronger focus on aesthetics, they were removed. Also make the bins smaller so staff and faculty can easily put them in their offices (I created my own for my office) Mandate that the housekeeping staff remove the items from the bins and clean the bins - regularly. Encourage students who acummulate recycleble items, to do so by awarding them. Install motion sensors on the faucets (not the toilets - can cause the toilet to flush to often) this can cut down on individuals leaving the water running. The housekeeping chemicals are not biodegradable... Encourage all professors to forward their syllabi electronically. There are many more ideas...I'm sure someone will cover them :)	Management, Procurement
If every office on campus recycled paper it could help save some money.	Recycling
Although recycling practices have significantly improved over the last couple of years, it still seems that more work needs to be done. Some buildings lack recycling bins. I think some are poorly labeled, and some people tend to put non-recycleables in the recycle bins.	Recycling
I believe we should find a way to recycle cloth the same way we now recycle plastic, glass, and paper.	Recycling
Each office has recycling bins, but there is no direction on whether the bin is for recycling metal, plastic or paper so everything is tossed in one recylce bin which means it most likely does not get recycled because no one is going back after all the recycling has been collected and separating the various materials.	Recycling
There is a huge drainage problem around the Technology Center...lots of water gather and then wasted.	Water Management/ Landscaping
Recycling bins should be strategically placed in every building on campus (specifically in high traffic areas). Additionally, a sign or sticker (could be placed on the side of the bin) that identifies recyclable items should be placed in the vicinity of the recycling bins. All employees and students should be urged to turn off lights when leaving rooms on campus. In an effort to generate a campus-wide buzz for "going green" a friendly competition could be spearheaded by students and interested employees.	Recycling, Competitions
Recycling bins for soda cans, etc next to each garbage can on campus. Recycling bins in staff lounge/eatting areas to recycyle plastic, etc from staff lunches. Use natural cleaning products across campus. Campus wide recycling of printer cartridges/toner bottles. More email usage from	Recycling, Procurement, Waste Management

professors to encourage students to email papers instead of printing them.	
There is way too much paperwork involved in all of our current proccesses. Develop more forms, processes and procedures that are online or soft copy until the last approval point.	Waste Management
I think there needs to be more recycling bins on campus.	Recycling
I'm appalled by the single use plates and cups for dining. It's a lot of trash to generate on a daily basis.	Dining, Waste Management
All buidings on campus should have recycling bins available for use, all documents should be available for editing in order to submit administative requests via email, and we need new pipes for water on the campus (too many building are producing brown water.	Recycling
Fixing leaky faucets in restrooms.	Water Management
Taking the time to caulk inside of Biddle Hall would conserve on energy costs. There are gaps where cold/hot air flows in from the outside.	Built Environment/ Energy
JCSU could provide recycling containers in each building, JCSU sould have theromostats centrally controlled,	Recycling
Among faculty at least, decreased reliance on paper for record keeping.	Waste Management
install solar panels request students not to wash just one shirt since washing is free- ask them to wash one load of clothes turn off lights in many building during day time when there is sufficient light in the room	Built Environment/ Energy, Water Management
Here are possibilities for support to develop a sustainability initiative. A gift from the Jessie Ball duPont Fund in the amount of $150,000 is providing considerable support to Agnes Scott's sustainability efforts. To achieve its goal to become climate neutral, the duPont Fund will help Agnes Scott conduct an energy audit, purchase electric/gas/water sub-metering equipment, develop an energy master plan and hire a Sustainability Fellow. Support for sustainability has also been received from the Community Foundation for Greater Atlanta and the National Trust for Historic Preservation. To achieve its goal to become climate neutral, the duPont Fund will help Agnes Scott conduct an energy audit, purchase electric/gas/water sub-metering equipment,	Funding, General, Built Environment/ Energy

develop an energy master plan and hire a Sustainability Fellow. Support for sustainability has also been received from the Community Foundation for Greater Atlanta and the National Trust for Historic Preservation.	
Recycling receptacles need to be in every building and classroom. Shredding machines for each building where the paper scraps can be recycled. Turn off the lights and electronics in the buildings at the end of every night. Use less Styrofoam to go plate in cafe and more biodegradable paper stock.	Recycling
Each year, let faculty know how to get recycling bins, and how to set up the pick-up of recycling. Do all registration and declaration of majors online. Present only online syllabi for classes. STOP requiring paper gradebook submission at the end of the year, when everything is supposed to be on Jenzabar anyway. Create a charging station on campus for electric vehicles.	Recycling
Turn of lights, Power in areas that are not being used. continue to save paper succh as coping,etc.	Built Environment/ Energy, Waste Management
Still too many areas where we are not using eco-friendly light bulbs or lighting. Building temperatures are such that employees use space heaters or fans in their work areas. Water use is excessive in at least one toilet in Biddle.	Built Environment/ Energy, Water Management
Collecting wasted paper in separate containers for recycling. encourage faculty and students to switch lights off in unattended rooms. install automatic faucets with sensors in restrooms.	Waste Management, Built Environment/ Energy

Table 4: table showing how employees at JCSU believe the University can most improve sustainability efforts

5. Would you read publications or fliers that gave employees ideas for living and working in a more environmentally sustainable way?

Summary of results: 82 employees said yes to this question; 10 answered no (see Figure 14).

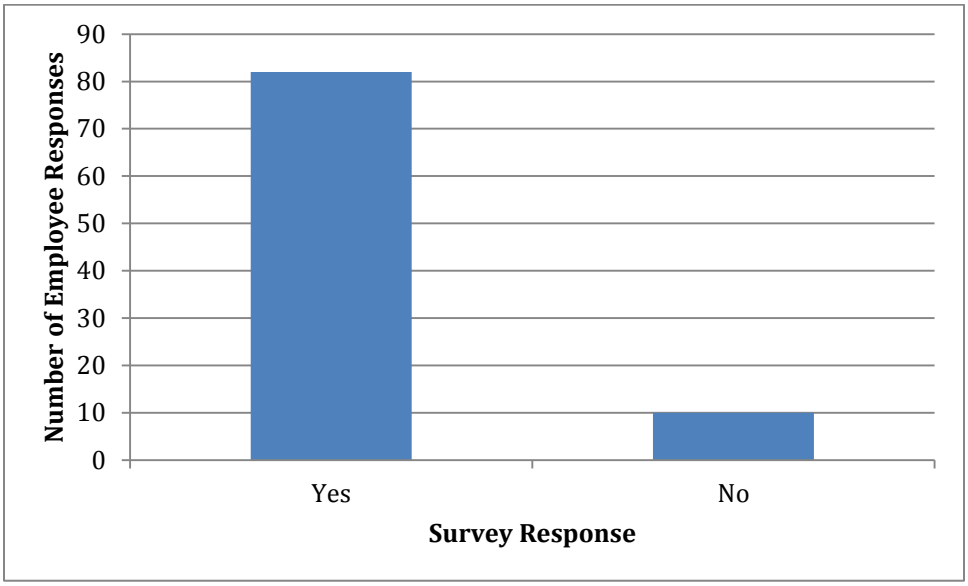

Figure 14: Figure showing areas whether faculty and staff would like to read sustainability publications

6. Would you use a JCSU website that provided ideas for living and working in a more environmentally sustainable way?

Summary of results: 85 employees said yes to this question; 7 answered no (see Figure 15).

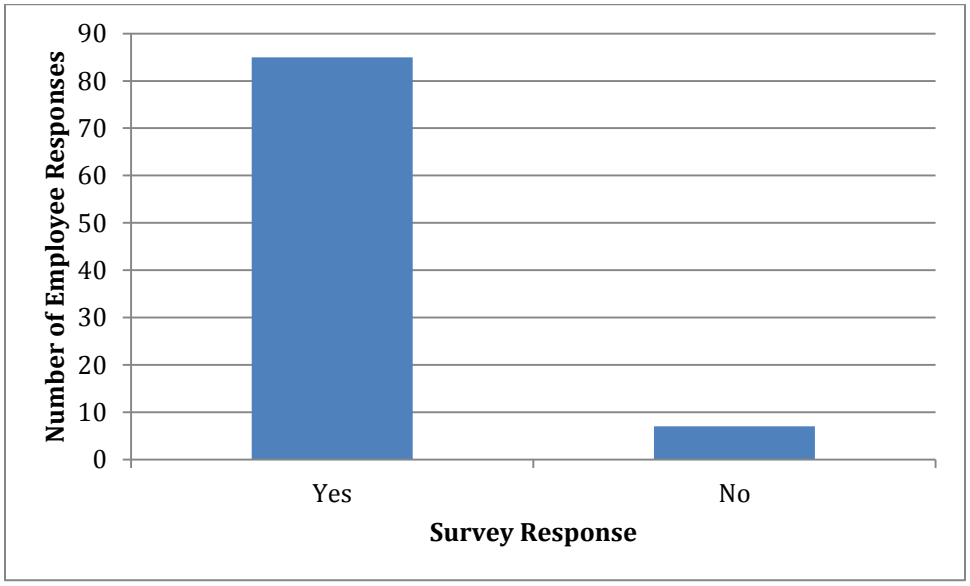

Figure 15: Figure showing areas whether faculty and staff would use a sustainability website

7. Do you like the idea of friendly competitions among departments or buildings to be more environmentally sustainable?

Summary of results: 78 employees said yes to this question; 12 answered no (see Figure 16).

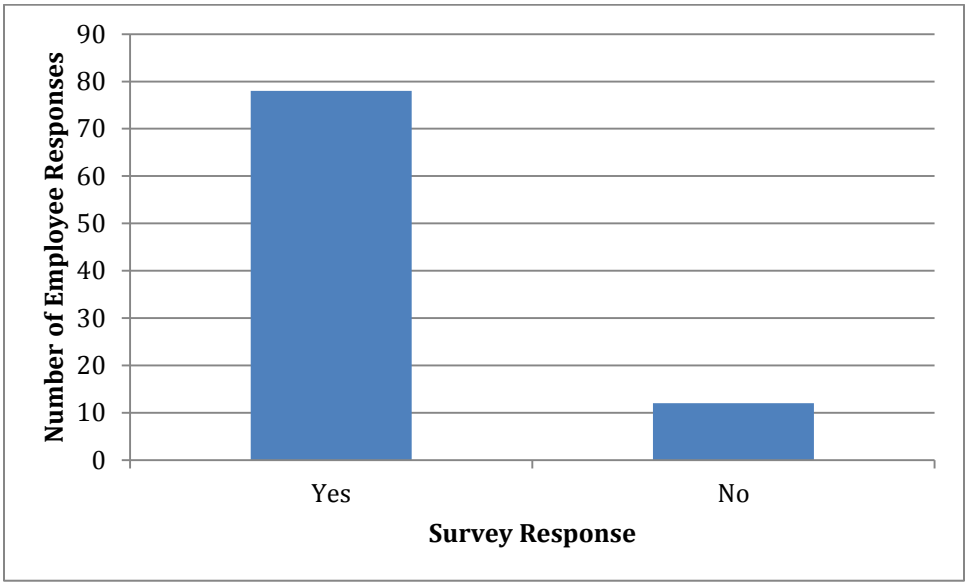

Figure 16: Figure showing faculty and staff interest in sustainability competitions

8. Do you like the idea of having meetings with other staff, faculty, and administrators to share ideas for environmental sustainability?

Summary of results: 59 employees said yes to this question; 33 answered no (see Figure 17).

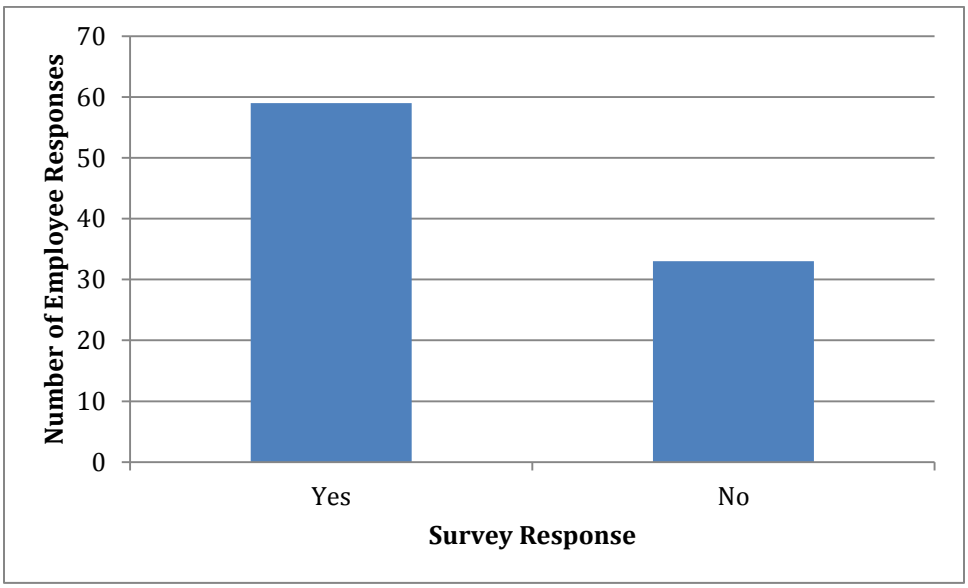

Figure 17: Figure showing faculty and staff interest in meetings to share ideas about sustainability

9. Do you like the idea of having green representatives in each building or department who serve as environmental sustainability resources?

Summary of results: 75 employees said yes to this question; 16 answered no (see Figure 18).

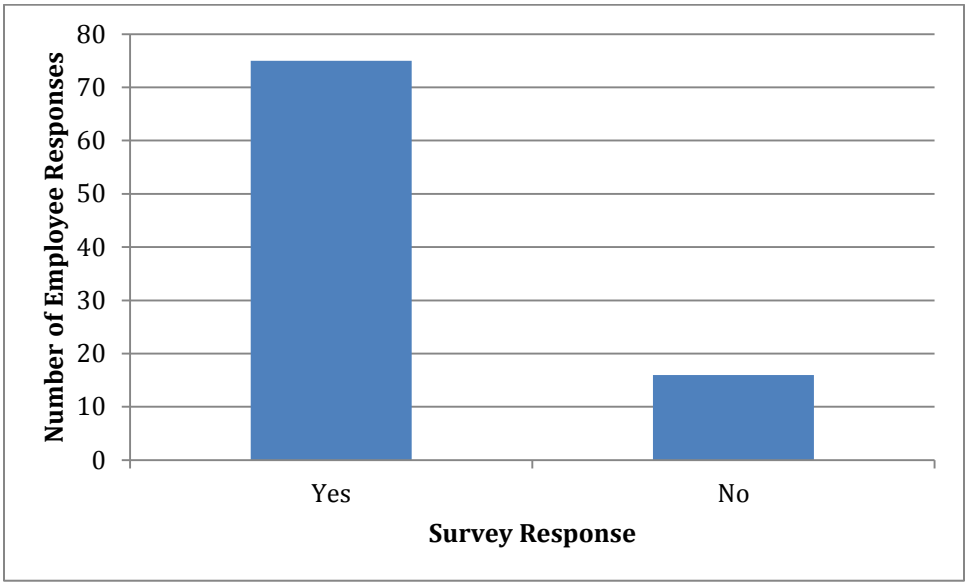

Figure 18: Figure showing faculty and staff interest in having representatives for sustainability

10. Please provide any specific comments about the activities suggested and any other activities around the theme of environmental sustainability that you would be interested in participating in on campus.

Text Responses	Category of Response
Workshops and tools to assist departments in going paperless	Workshops
Going green helps save the earth and the eco system	General
It just makes sense to do this, we all share the world.	General
I would like to assit in places signs to cut lights off in the areas that are not being used.	Built Environment/ Energy Efficiency
This is an academic insitiution. Have some research on the cost savings and envornment savings presented to teh faculty and staff. Have green prjects built into ecololgy classes	Research, Curriculum
I would be interested in serving on a green committee. I have incorporated many green practice in my home and would be more than happy to assist.	Campus Committee, Staff Involvement
The competition would be a fun way to encourage and	Competitions

publicized staff and faculty to recycle.	
Any idea that helps us recycle anything recycleable is a god idea to me. I like the idea of brainstorming other ideas and having someone in each building be in charge of recycling practices in that building.	Recycling, Building Representatives
Student dorm associations would need to be involved in enlarging any waste reduction program	Student Involvement
I think if people understood the reasons to be friendly to the environment, and how it will affect them later, they would be more likely to recycle. And competition almost always gets participation. Currently, many of our students, and others, do not remember the old addage 'waste not, want not'.	Competition, Communication
Like the idea of student led action teams to improve green ecology both on campus and in surrounding arena. Like idea of growing greenhouse to grow sustainable crops and eat them. Do not like ideas that repeat within the current framework.	Student Representatives
Have a recycling gathering with where people can come and do games. Have people bring things that can be recycled. Also with having faculty and staff on campus when there is an event for example a basketball or football game offer a discount for bring some type of item that can be recycle. Finally see if the word can spread to the community.	Recycling, Athletic Events, Communication, Community Involvement
Educate faculty, staff & students about how to conserve energy	Energy Use
Create courses that explore the notion of environmental sustainability & internships. For instance we could have dorms collect bottles and cans and use the money for improvements or things students want in their space.	Curriculum
I'd participate in friendly competition with colleagues, departments, and buildings on campus, to see who can be more environmentally sustainable. For example, I'd compete in most fuel efficient cars, lowest bill for copying/printing, most compliance with all online syllabi and grading, and I would absolutely buy an electric car if I thought Smith would set up a charging station on campus.	Competitions
Don't particularly want to attend another meeting to share ideas.	Meetings

representatives in each building or department can meet and come up with ways to encourage faculty and staff to be more environmentally conscious.	Building Representatives

Table 5: table showing employee responses to question about specific types of events on campus and their interest in participating

11. What sustainability-focused events would you be interested in attending on campus?

Summary of results: 38 employees indicated interest in academic speakers, 45 employees indicated interest in hearing speakers in business and industry, 25 employees indicated interest in sustainable meals, and 4 employees indicated interest in "other" activities (see Figure 19).

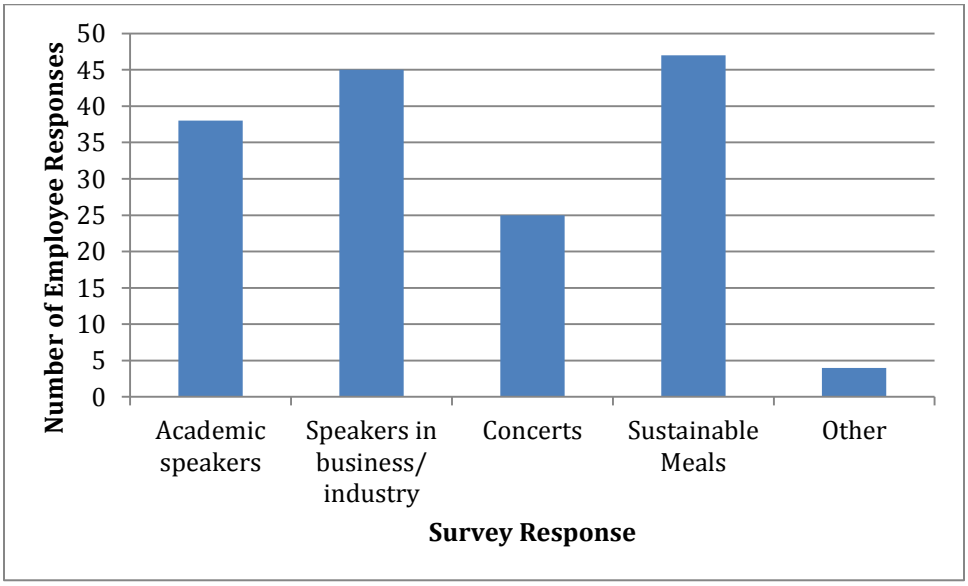

Figure 19: figure showing what types of sustainability-focused events that faculty and staff would be interested in participating in; the faculty and staff members that indicated "other" as a response indicated interest in attending "anything creative or interesting," action groups that take specific action on campus or in community like Habitat for Greenability," Lyceum events, and "residence Hall competitions"

12. Please us this area to provide any specific comments on events that you would be interested in participating in on campus.

Text Responses	Category of Response
Encourage eating healthy, locally produced foods instead of fast food	Dining/ Sustainable Food
Concerts that provide awareness.	Concerts
Morality speakers for young adults	Speakers
perhaps put together a contest where students could compose skits, raps, poetry, etc., about the importance of sustainability. Maybe an essay contest. Include prizes. I think	Contests, General

peopel are tired of the same old lectures about topics like this, and we need more exciting ways to get the message across.	
Discussion within student government, fraternities, sororities, dorm associations and other groups about what types of sustainability activities they would participate in.	Meetings, Student Involvement
Growing green campus garden	Campus Garden
It's not necessarily an event, but I'd like to see a volunteer garden on campus.	Campus Garden
Drama More interesting lyceum series Music festivals	Artistic Events, Lyceum Series
I gave a presentation on Global Warming and Carbon Footprints as an International Symposium-I can do it here as a Lyceum event	Speakers
Research competitions on how to reduce our wastefulness, Earth Day performances/exhibitions/presentations.	Competitions
The Science department could arrange seminars for students to attend which can be counted towards the students Lyceums events. Those seminars can inform the students the importance of acting responsibly towards the environmental. I will be glad to participate in preparing and presenting such seminars.	Seminars, Lyceum Series

Table 6: table showing what types of events employees would be interested in participating in on campus